PALACIOS
ENGINEERING LLC

STRUCTURAL CALCULATIONS FOR

10840 SW 67TH AVE

10840 SW 67TH AVE,
MIAMI, FLORIDA 33156

NESTOR JOSE PALACIOS
LICENSE
No. 93378
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

Digitally signed by Nestor J Palacios
DN: CN=Nestor J Palacios,
dnQualifier=A01410D00000194F71E051700026EB4,
O=Palacios Engineering LLC, C=US
Reason: I am the author of this document
Date: 2025.04.06 20:28:00-04'00'

Nestor Jose Palacios, P.E.
FL. Lic. No. 93378

ENGINEER OF RECORD ASSUMES RESPONSIBILITY FOR BOTH MANUAL AND COMPUTER-GENERATED CALCULATIONS INCLUDED IN THIS BOOK (PAGES 1 THRU 1040).

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DESIGN LOADS:

Roof SDL	= 25 psf
Roof LL	= 30 psf
2nd Floor SDL	= 35 psf
2nd Floor LL	= 40 psf
Ground Floor SDL	= 35 psf
Ground Floor LL	= 40 psf
Balcony SDL	= 15 psf
Balcony LL	= 60 psf
Terrace SDL	= 15 psf
Terrace LL	= 60 psf
Garage SDL	= 15 psf
Garage LL	= 50 psf
Stairs SDL	= 15 psf
Stairs LL	= 80 psf

Wind Loads: (ASCE 7-22):

Velocity = 175 mph (Hurricane Ocean Line)
Exposure = C
Importance Factor = 1.0
Internal Pressure Coeff. = +/- 0.18
Directionality Factor, Kd = 0.85
Building Category = II

Note: This structure has been designed as "enclosed" and requires impact resistant glass or shutters to comply with Florida Building Code sections R4403.16 & R4410.

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Wind Loads per ASCE 7-22

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MecaWind v2522

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Calculations Prepared by:
Date: Mar 13, 2025
File Location: C:\Users\Nestor\OneDrive\PALACIOS ENGINEERING\PROJECTS\MIK ARCHITECTURE\10840 SW 67 Ave\Calculations\wind\Wind Loads Table.wnd

General:
Reference Abbreviations: T: Table, F: Figure, E: Equation, §: Section

Wind Load Standard	=	ASCE 7-22	Basic Wind Speed	=	175.0 mph
Exposure Classification	=	C	Risk Category	=	II
Structure Type	=	Building	Basis for Wind Pressures	=	ASD
MWFRS Analysis Method	=	Ch 27	C&C Analysis Method	=	Ch 30 Pt 1
Dynamic Type of Structure	=	Rigid	Advanced Options	=	True
Simple Diaphragm Building	=	True	Base Reactions Output Type	=	Detailed
MWFRS Pressure Elevations	=	Automatic	Topographic Effects	=	None
Override Directionality Factor	=	False	Override Gust Factor	=	False
Override Minimum Pressure	=	False			

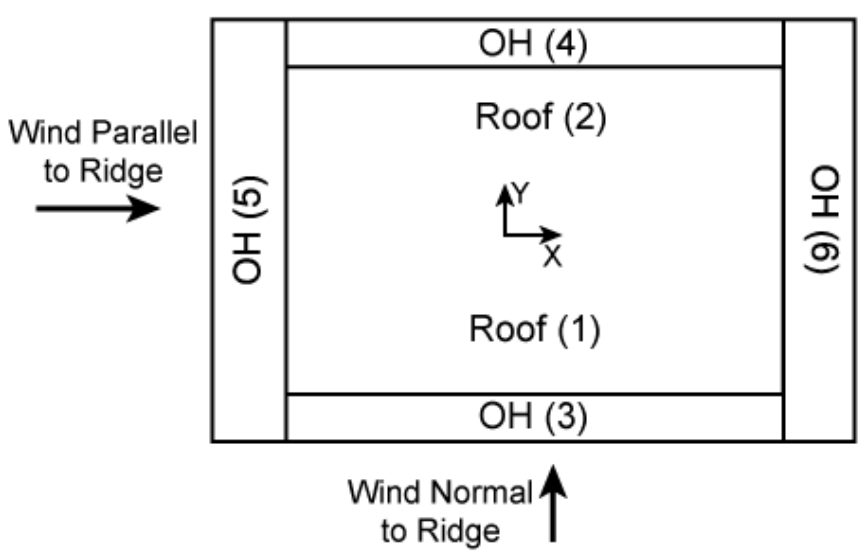
Building:

Roof	=	Roof Type	=	Flat	Encl	=	Enclosure Classification	=	Enclosed
Help	=	Help on Building Roof Type	=	Help	IsCust	=	Custom Roof	=	False
RfHt	=	Roof Height	=	26.000 ft	W	=	Building Width	=	110.0000 ft
L	=	Building Length	=	133.0000 ft	OH	=	Overhang Configuration	=	All None
Par	=	Parapet	=	Solid	P_{ht}	=	Parapet Height	=	1.6700 ft
z_i	=	Highest Opening Elevation	=	0.0000 ft	HT_{over}	=	Override Mean Roof Height	=	False
Ht_{man}	=	Mean Roof Height	=	26.000 ft	RA_{over}	=	Override Roof Area	=	False
GC_{pi_o}	=	Override GC_{pi} value	=	False	IsElev	=	Building is Elevated	=	False

Exposure Constants [T:26.11-1]:

α = 3-s Gust-speed exponent	=	9.800	Z_g = Nominal Ht of Boundary Layer	=	2460.000 ft
â = Reciprocal of α	=	0.102	b = 3 sec gust speed factor	=	1.000
α_m = Mean hourly Wind-Speed Exponent	=	0.156	b_m = Mean hourly Windspeed Exponent	=	0.660
c = Turbulence Intensity Factor	=	0.200	ε = Integral Length Scale Exponent	=	0.2000

Main Wind Force Resisting System (MWFRS) Wind Calculations per Ch 27



h = Mean structure height	=	26.000 ft	$K_h = 2.41 \cdot (Z/Z_g)^{2/\alpha}$ T:26.10-1	=	0.952
K_{zt} = No Topographic Feature	=	1.000	K_d = Directionality Factor T:26.6-1	=	0.85
GC_{pi} = ± Internal Press Coef T:26.13-1	=	±0.18	LF = ASD Load Factor	=	0.60
K_e = Ground Elev Factor T:26.10-1	=	1.000	$q_h = .00256 \cdot K_h \cdot K_{zt} \cdot K_e \cdot V^2 \cdot LF$ E:26.10-1	=	44.79 psf
q_{in} = Negative Internal Pressure: q_h	=	44.79 psf	q_{ip} = For $+GC_{pi}$ use q_h	=	44.79 psf
$q_p = .00256 \cdot K_z \cdot K_{zt} \cdot K_e \cdot V^2 \cdot LF$ E:26.10-1	=	45.37 psf	A_{roof} = Roof Area	=	14,630.00 ft^2

MWFRS Wind Loads [Normal to Ridge]

h = Mean Roof Height of Building = 26.0000 ft

R_{Ht} = Ridge Height Of Roof = 26.0000 ft

L = Building Width Parallel To Wind = 110.0000 ft

h/L = Ratio: h/L = 0.236

Cp_{LW} = Leeward Wall Coefficient = -0.500

GC_{pn_ww} = Parapet Windward Net Coeff = 1.500

h_p = Height To the top Of the Parapet = 27.670 ft

B = Building Width Normal To Wind = 133.0000 ft

L/B = Ratio: L/B = 0.827

Cp_{WW} = Windward Wall Coefficient = 0.800

Cp_{SW} = Side Wall Coefficient = -0.700

GC_{pn_lw} = Parapet Leeward Net Coeff = -1.000

Gust Factor Calculation for Wind: [Normal to Ridge]

Gust Factor Category I Rigid Structures - Simplified Method

G_1 = Simplified: For Rigid Structures can use 0.85 = 0.85

Gust Factor Category II Rigid Structures - Complete Analysis

Z_m = Equiv Struc Height: Max(0.6•h, Z_{min}) = 15.600 ft

I_{zm} = Turbulence Intensity: $c\bullet(33/Z_m)^{1/6}$ [E:26.11-7] = 0.227

L_{zm} = Turbulence Integral Length Scale: $\ell\bullet(Z_m/33)^{\varepsilon}$ [E:26.11-9] = 430.420 ft

B = Building Width Width Normal to Wind Direction = 133.000 ft

Q = $[1/(1+0.63\bullet[(B+h)/L_{zm}]^{0.63})]^{0.5}$ [E:26.11-8] = 0.865

G_2 = Detailed: $0.925\bullet[(1+1.7\bullet g_q\bullet I_{zm}\bullet Q)/(1+1.7\bullet g_v\bullet I_{zm})]$ [E:26.11-6] = 0.854

Gust Factor Used in Analysis

G = Gust Factor: Min(G_1, G_2) = 0.850

Wall Wind Pressures [Normal to Ridge]
All wind pressures include a Load Factor (LF) of 0.6

Elev ft	GC_{pi}	q_i psf	K_z	K_{zt}	q_z psf	Windward Press psf	Leeward Press psf	Side Press psf	Total Press psf	Minimum Pressure* psf
27.670	Parapet	44.79	0.964	1.000	45.37	57.84	-38.56	0.00	96.41	9.60
26.000	+0.18	44.79	0.952	1.000	44.79	19.04	-23.04	-29.51	42.07	9.60
21.000	+0.18	44.79	0.912	1.000	42.88	17.93	-23.04	-29.51	40.97	9.60
16.000	+0.18	44.79	0.862	1.000	40.57	16.60	-23.04	-29.51	39.63	9.60
11.000	+0.18	44.79	0.851	1.000	40.04	16.29	-23.04	-29.51	39.32	9.60
6.000	+0.18	44.79	0.851	1.000	40.04	16.29	-23.04	-29.51	39.32	9.60
1.000	+0.18	44.79	0.851	1.000	40.04	16.29	-23.04	-29.51	39.32	9.60
27.670	Parapet	44.79	0.964	1.000	45.37	57.84	-38.56	0.00	96.41	9.60
26.000	-0.18	44.79	0.952	1.000	44.79	32.74	-9.33	-15.80	42.07	9.60
21.000	-0.18	44.79	0.912	1.000	42.88	31.64	-9.33	-15.80	40.97	9.60
16.000	-0.18	44.79	0.862	1.000	40.57	30.30	-9.33	-15.80	39.63	9.60
11.000	-0.18	44.79	0.851	1.000	40.04	30.00	-9.33	-15.80	39.32	9.60
6.000	-0.18	44.79	0.851	1.000	40.04	30.00	-9.33	-15.80	39.32	9.60
1.000	-0.18	44.79	0.851	1.000	40.04	30.00	-9.33	-15.80	39.32	9.60

K_z = $2.41\bullet(Z/Z_g)^{2/\alpha}$
GC_{pi} = +Internal Coef T:26.13-1
q_{ip} = For +GC_{pi} use q_h
Side = $q_h\bullet K_d\bullet G\bullet Cp_{SW}-q_{ip}\bullet K_d\bullet(GC_{pi+})$ E:27.3-1
Windward = $q_z\bullet K_d\bullet G\bullet Cp_{WW}-q_{ip}\bullet K_d\bullet(GC_{pi+})$ E:27.3-1
+Press = Pressure Acting Toward Surface
§27.1.5 = MWFRS Min Wall Pressure = 9.60 psf
p_p = $q_h\bullet K_d\bullet(GC_{pn_lw})$ E:27.3-3

K_{zt} = No Topographic Feature
q_z = $.00256\bullet K_z\bullet K_{zt}\bullet K_e\bullet V^2\bullet LF$ E:26.10-1
q_{in} = Negative Internal Pressure: q_h
Leeward = $q_h\bullet K_d\bullet G\bullet Cp_{LW}-q_{ip}\bullet K_d\bullet(GC_{pi+})$ E:27.3-1
Total = Windward - Leeward
-Press = Pressure Acting Away from Surface
p_p = $q_h\bullet K_d\bullet(GC_{pn_ww})$ E:27.3-3

Roof Wind Pressures [Normal to Ridge]
All wind pressures include a Load Factor (LF) of 0.6

Component	Description	Location	Start ft	End ft	θ °	Basis	GC_{pi}	C_{pMin}	C_{pMax}	P_{min} psf	P_{max} psf	P_{min} psf
Roof	Roof 0 to h	All	0.000	26.000	0.0	P	+0.18	-0.9	-0.18	-35.98	-12.68	4.80
Roof	Roof h to 2•h	All	26.000	52.000	0.0	P	+0.18	-0.5	-0.18	-23.04	-12.68	4.80
Roof	Roof ≥ 2•h	All	52.000	110.000	0.0	P	+0.18	-0.3	-0.18	-16.56	-12.68	4.80
Roof	Roof 0 to h	All	0.000	26.000	0.0	P	-0.18	-0.9	-0.18	-22.27	1.03	4.80
Roof	Roof h to 2•h	All	26.000	52.000	0.0	P	-0.18	-0.5	-0.18	-9.33	1.03	4.80
Roof	Roof ≥ 2•h	All	52.000	110.000	0.0	P	-0.18	-0.3	-0.18	-2.86	1.03	4.80

Roof Pressures based upon Ch 27:
Component = The building component for pressures
Start = Start Dist from Windward Edge
C_{pMin} = Smallest Coefficient Magnitude

Location = Reference Graphic in Output for Values
End = End Dist from Windward Edge
C_{pMax} = Largest Coefficient Magnitude

P_{min} = $q_h \cdot K_d \cdot G \cdot C_{pMin} - q_{ip} \cdot K_d \cdot GC_{piE:27.3-1}$
GC_{pi} = +Internal Coef $_{T:26.13-1}$
P_{min} = Min Press projected on vertical plane $_{§27.1.5}$
§27.1.5 = MWFRS Min Wall Pressure = 9.60 psf
-Press = Pressure Acting Away from Surface

P_{max} = $q_h \cdot K_d \cdot G \cdot C_{pMax} - q_{in} \cdot K_d \cdot GC_{piE:27.3-1}$
Basis = P=Parallel to Ridge: N=Normal to Ridge
θ = Roof Slope Relative to Wind
+Press = Pressure Acting Toward Surface

• The smaller uplift pressures due to C_{pMin} can become critical when wind is combined with roof live load or snow load; load combinations are given in ASCE 7

Reactions Wind Walls+Roof +GCPi: [Normal to Ridge]

Description	Pressure psf	Area ft²	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	222.11	0.00	-55.00	-26.84	0.00	-8.57	0.00	229.84	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-23.50	0.00	-15.32	0.00	359.99	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-18.50	0.00	-15.32	0.00	283.40	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-13.50	0.00	-15.32	0.00	206.80	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-8.50	0.00	-15.32	0.00	130.21	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-3.50	0.00	-15.32	0.00	53.62	0.00	0.00
Leeward Wall	-23.04	133.00	0.00	-55.00	-0.50	0.00	-3.06	0.00	1.53	0.00	0.00
Roof	-16.56	7,714.00	0.00	-26.00	-26.00	0.00	0.00	-127.77	-3,321.91	0.00	0.00
Roof	-23.04	3,458.00	0.00	16.00	-26.00	0.00	0.00	-79.66	1,274.52	0.00	0.00
Roof	-35.98	1,729.00	0.00	48.50	-26.00	0.00	0.00	-62.21	3,017.27	0.00	0.00
Roof	-35.98	1,729.00	0.00	35.50	-26.00	0.00	0.00	-62.21	2,208.52	0.00	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-23.50	-16.23	0.00	0.00	0.00	-381.40	0.00
Side Wall	-29.51	550.00	66.50	0.00	-23.50	16.23	0.00	0.00	0.00	381.40	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-18.50	-16.23	0.00	0.00	0.00	-300.25	0.00
Side Wall	-29.51	550.00	66.50	0.00	-18.50	16.23	0.00	0.00	0.00	300.25	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-13.50	-16.23	0.00	0.00	0.00	-219.10	0.00
Side Wall	-29.51	550.00	66.50	0.00	-13.50	16.23	0.00	0.00	0.00	219.10	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-8.50	-16.23	0.00	0.00	0.00	-137.95	0.00
Side Wall	-29.51	550.00	66.50	0.00	-8.50	16.23	0.00	0.00	0.00	137.95	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-3.50	-16.23	0.00	0.00	0.00	-56.80	0.00
Side Wall	-29.51	550.00	66.50	0.00	-3.50	16.23	0.00	0.00	0.00	56.80	0.00
Side Wall	-29.51	110.00	-66.50	0.00	-0.50	-3.25	0.00	0.00	0.00	-1.62	0.00
Side Wall	-29.51	110.00	66.50	0.00	-0.50	3.25	0.00	0.00	0.00	1.62	0.00
Windward Parapet	57.84	222.11	0.00	55.00	-26.84	0.00	-12.85	0.00	344.77	0.00	0.00
Windward Wall	19.04	665.00	0.00	55.00	-23.50	0.00	-12.66	0.00	297.51	0.00	0.00
Windward Wall	17.93	665.00	0.00	55.00	-18.50	0.00	-11.93	0.00	220.63	0.00	0.00
Windward Wall	16.60	665.00	0.00	55.00	-13.50	0.00	-11.04	0.00	148.98	0.00	0.00
Windward Wall	16.29	665.00	0.00	55.00	-8.50	0.00	-10.83	0.00	92.07	0.00	0.00
Windward Wall	16.29	665.00	0.00	55.00	-3.50	0.00	-10.83	0.00	37.91	0.00	0.00
Windward Wall	16.29	133.00	0.00	55.00	-0.50	0.00	-2.17	0.00	1.08	0.00	0.00
Total		27,710.22					-160.52	-331.85	5,586.74		

Reactions Wind Walls Only +GCPi: [Normal to Ridge]

Description	Pressure psf	Area ft²	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	222.11	0.00	-55.00	-26.84	0.00	-8.57	0.00	229.84	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-23.50	0.00	-15.32	0.00	359.99	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-18.50	0.00	-15.32	0.00	283.40	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-13.50	0.00	-15.32	0.00	206.80	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-8.50	0.00	-15.32	0.00	130.21	0.00	0.00
Leeward Wall	-23.04	665.00	0.00	-55.00	-3.50	0.00	-15.32	0.00	53.62	0.00	0.00
Leeward Wall	-23.04	133.00	0.00	-55.00	-0.50	0.00	-3.06	0.00	1.53	0.00	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-23.50	-16.23	0.00	0.00	0.00	-381.40	0.00
Side Wall	-29.51	550.00	66.50	0.00	-23.50	16.23	0.00	0.00	0.00	381.40	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-18.50	-16.23	0.00	0.00	0.00	-300.25	0.00
Side Wall	-29.51	550.00	66.50	0.00	-18.50	16.23	0.00	0.00	0.00	300.25	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-13.50	-16.23	0.00	0.00	0.00	-219.10	0.00
Side Wall	-29.51	550.00	66.50	0.00	-13.50	16.23	0.00	0.00	0.00	219.10	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-8.50	-16.23	0.00	0.00	0.00	-137.95	0.00
Side Wall	-29.51	550.00	66.50	0.00	-8.50	16.23	0.00	0.00	0.00	137.95	0.00
Side Wall	-29.51	550.00	-66.50	0.00	-3.50	-16.23	0.00	0.00	0.00	-56.80	0.00
Side Wall	-29.51	550.00	66.50	0.00	-3.50	16.23	0.00	0.00	0.00	56.80	0.00
Side Wall	-29.51	110.00	-66.50	0.00	-0.50	-3.25	0.00	0.00	0.00	-1.62	0.00
Side Wall	-29.51	110.00	66.50	0.00	-0.50	3.25	0.00	0.00	0.00	1.62	0.00
Windward Parapet	57.84	222.11	0.00	55.00	-26.84	0.00	-12.85	0.00	344.77	0.00	0.00
Windward Wall	19.04	665.00	0.00	55.00	-23.50	0.00	-12.66	0.00	297.51	0.00	0.00
Windward Wall	17.93	665.00	0.00	55.00	-18.50	0.00	-11.93	0.00	220.63	0.00	0.00
Windward Wall	16.60	665.00	0.00	55.00	-13.50	0.00	-11.04	0.00	148.98	0.00	0.00
Windward Wall	16.29	665.00	0.00	55.00	-8.50	0.00	-10.83	0.00	92.07	0.00	0.00
Windward Wall	16.29	665.00	0.00	55.00	-3.50	0.00	-10.83	0.00	37.91	0.00	0.00
Windward Wall	16.29	133.00	0.00	55.00	-0.50	0.00	-2.17	0.00	1.08	0.00	0.00
Total		13,080.22					-160.52		2,408.35		

Reactions Wind Walls+Roof -GCPi: [Normal to Ridge]

Description	Pressure psf	Area ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	222.11	0.00	-55.00	-26.84	0.00	-8.57	0.00	229.84	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-23.50	0.00	-6.20	0.00	145.78	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-18.50	0.00	-6.20	0.00	114.76	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-13.50	0.00	-6.20	0.00	83.75	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-8.50	0.00	-6.20	0.00	52.73	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-3.50	0.00	-6.20	0.00	21.71	0.00	0.00
Leeward Wall	-9.33	133.00	0.00	-55.00	-0.50	0.00	-1.24	0.00	0.62	0.00	0.00
Roof	1.03	7,714.00	0.00	-26.00	-26.00	0.00	0.00	7.93	206.19	0.00	0.00
Roof	1.03	3,458.00	0.00	16.00	-26.00	0.00	0.00	3.55	-56.88	0.00	0.00
Roof	1.03	1,729.00	0.00	48.50	-26.00	0.00	0.00	1.78	-86.21	0.00	0.00
Roof	1.03	1,729.00	0.00	35.50	-26.00	0.00	0.00	1.78	-63.10	0.00	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-23.50	-8.69	0.00	0.00	0.00	-204.23	0.00
Side Wall	-15.80	550.00	66.50	0.00	-23.50	8.69	0.00	0.00	0.00	204.23	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-18.50	-8.69	0.00	0.00	0.00	-160.78	0.00
Side Wall	-15.80	550.00	66.50	0.00	-18.50	8.69	0.00	0.00	0.00	160.78	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-13.50	-8.69	0.00	0.00	0.00	-117.32	0.00
Side Wall	-15.80	550.00	66.50	0.00	-13.50	8.69	0.00	0.00	0.00	117.32	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-8.50	-8.69	0.00	0.00	0.00	-73.87	0.00
Side Wall	-15.80	550.00	66.50	0.00	-8.50	8.69	0.00	0.00	0.00	73.87	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-3.50	-8.69	0.00	0.00	0.00	-30.42	0.00
Side Wall	-15.80	550.00	66.50	0.00	-3.50	8.69	0.00	0.00	0.00	30.42	0.00
Side Wall	-15.80	110.00	-66.50	0.00	-0.50	-1.74	0.00	0.00	0.00	-0.87	0.00
Side Wall	-15.80	110.00	66.50	0.00	-0.50	1.74	0.00	0.00	0.00	0.87	0.00
Windward Parapet	57.84	222.11	0.00	55.00	-26.84	0.00	-12.85	0.00	344.77	0.00	0.00
Windward Wall	32.74	665.00	0.00	55.00	-23.50	0.00	-21.78	0.00	511.72	0.00	0.00
Windward Wall	31.64	665.00	0.00	55.00	-18.50	0.00	-21.04	0.00	389.26	0.00	0.00
Windward Wall	30.30	665.00	0.00	55.00	-13.50	0.00	-20.15	0.00	272.04	0.00	0.00
Windward Wall	30.00	665.00	0.00	55.00	-8.50	0.00	-19.95	0.00	169.55	0.00	0.00
Windward Wall	30.00	665.00	0.00	55.00	-3.50	0.00	-19.95	0.00	69.82	0.00	0.00
Windward Wall	30.00	133.00	0.00	55.00	-0.50	0.00	-3.99	0.00	1.99	0.00	0.00
Total		27,710.22					-160.52	15.04	2,408.35		

Reactions Wind Walls Only -GCPi: [Normal to Ridge]

Description	Pressure psf	Area ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	222.11	0.00	-55.00	-26.84	0.00	-8.57	0.00	229.84	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-23.50	0.00	-6.20	0.00	145.78	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-18.50	0.00	-6.20	0.00	114.76	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-13.50	0.00	-6.20	0.00	83.75	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-8.50	0.00	-6.20	0.00	52.73	0.00	0.00
Leeward Wall	-9.33	665.00	0.00	-55.00	-3.50	0.00	-6.20	0.00	21.71	0.00	0.00
Leeward Wall	-9.33	133.00	0.00	-55.00	-0.50	0.00	-1.24	0.00	0.62	0.00	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-23.50	-8.69	0.00	0.00	0.00	-204.23	0.00
Side Wall	-15.80	550.00	66.50	0.00	-23.50	8.69	0.00	0.00	0.00	204.23	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-18.50	-8.69	0.00	0.00	0.00	-160.78	0.00
Side Wall	-15.80	550.00	66.50	0.00	-18.50	8.69	0.00	0.00	0.00	160.78	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-13.50	-8.69	0.00	0.00	0.00	-117.32	0.00
Side Wall	-15.80	550.00	66.50	0.00	-13.50	8.69	0.00	0.00	0.00	117.32	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-8.50	-8.69	0.00	0.00	0.00	-73.87	0.00
Side Wall	-15.80	550.00	66.50	0.00	-8.50	8.69	0.00	0.00	0.00	73.87	0.00
Side Wall	-15.80	550.00	-66.50	0.00	-3.50	-8.69	0.00	0.00	0.00	-30.42	0.00
Side Wall	-15.80	550.00	66.50	0.00	-3.50	8.69	0.00	0.00	0.00	30.42	0.00
Side Wall	-15.80	110.00	-66.50	0.00	-0.50	-1.74	0.00	0.00	0.00	-0.87	0.00
Side Wall	-15.80	110.00	66.50	0.00	-0.50	1.74	0.00	0.00	0.00	0.87	0.00
Windward Parapet	57.84	222.11	0.00	55.00	-26.84	0.00	-12.85	0.00	344.77	0.00	0.00
Windward Wall	32.74	665.00	0.00	55.00	-23.50	0.00	-21.78	0.00	511.72	0.00	0.00
Windward Wall	31.64	665.00	0.00	55.00	-18.50	0.00	-21.04	0.00	389.26	0.00	0.00
Windward Wall	30.30	665.00	0.00	55.00	-13.50	0.00	-20.15	0.00	272.04	0.00	0.00
Windward Wall	30.00	665.00	0.00	55.00	-8.50	0.00	-19.95	0.00	169.55	0.00	0.00
Windward Wall	30.00	665.00	0.00	55.00	-3.50	0.00	-19.95	0.00	69.82	0.00	0.00
Windward Wall	30.00	133.00	0.00	55.00	-0.50	0.00	-3.99	0.00	1.99	0.00	0.00
Total		13,080.22					-160.52		2,408.35		

Reactions Wind Walls+Roof Min Pressure: [Normal to Ridge]

Description	Pressure psf	Area* ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Windward Parapet	9.60	222.11	0.00	55.00	-26.84	0.00	-2.13	0.00	57.22	0.00	0.00
Windward Wall	9.60	665.00	0.00	55.00	-23.50	0.00	-6.38	0.00	150.02	0.00	0.00
Windward Wall	9.60	665.00	0.00	55.00	-18.50	0.00	-6.38	0.00	118.10	0.00	0.00

Windward Wall	9.60	665.00	0.00	55.00	-13.50	0.00	-6.38	0.00	86.18	0.00	0.00
Windward Wall	9.60	665.00	0.00	55.00	-8.50	0.00	-6.38	0.00	54.26	0.00	0.00
Windward Wall	9.60	665.00	0.00	55.00	-3.50	0.00	-6.38	0.00	22.34	0.00	0.00
Windward Wall	9.60	133.00	0.00	55.00	-0.50	0.00	-1.28	0.00	0.64	0.00	0.00
Total		3,680.11					-35.33		488.78		

Notes:
Moments are calculated relative to the origin (0,0,0) of the building
X= Along Building ridge, Y = Normal to Building Ridge, Z = Vertical
X_c = X Distance from Origin (0,0,0) to the center of the Component being considered
Y_c = Y Distance from Origin (0,0,0) to the center of the Component being considered
Z_c = Z Distance from Origin (0,0,0) to the center of the Component being considered
Moments calculated using cross product of Force Vector (F_x, F_y, F_z) with Moment Vector (X_c, Y_c, Z_c)
MIN = Minimum pressures on Walls = 9.60 psf and Roof = 4.80 psf
Area* = Area of the surface projected onto a vertical plane normal to wind.

MWFRS Wind Loads [Parallel to Ridge]

h = Mean Roof Height of Building = 26.0000 ft
R_{Ht} = Ridge Height Of Roof = 26.0000 ft
L = Building Width Parallel To Wind = 133.0000 ft
h/L = Ratio: h/L = 0.195
Cp_{LW} = Leeward Wall Coefficient = -0.458
GC_{pn_ww} = Parapet Windward Net Coeff = 1.500

h_p = Height To the top Of the Parapet = 27.670 ft
B = Building Width Normal To Wind = 110.0000 ft
L/B = Ratio: L/B = 1.209
Cp_{WW} = Windward Wall Coefficient = 0.800
Cp_{SW} = Side Wall Coefficient = -0.700
GC_{pn_lw} = Parapet Leeward Net Coeff = -1.000

Gust Factor Calculation for Wind: [Parallel to Ridge]

Gust Factor Category I Rigid Structures - Simplified Method

G_1 = Simplified: For Rigid Structures can use 0.85 = 0.85

Gust Factor Category II Rigid Structures - Complete Analysis

Z_m = Equiv Struc Height: Max(0.6•h, Z_{min}) = 15.600 ft
I_{zm} = Turbulence Intensity: $c\bullet(33/Z_m)^{1/6}$ [E:26.11-7] = 0.227
L_{zm} = Turbulence Integral Length Scale: $\ell\bullet(Z_m/33)^{\varepsilon}$ [E:26.11-9] = 430.420 ft
B = Building Width Width Normal to Wind Direction = 110.000 ft
Q = $[1/(1+0.63\bullet[(B+h)/L_{zm}]^{0.63})]^{0.5}$ [E:26.11-8] = 0.875
G_2 = Detailed: $0.925\bullet[(1+1.7\bullet g_q\bullet I_{zm}\bullet Q)/(1+1.7\bullet g_v\bullet I_{zm})]$ [E:26.11-6] = 0.860

Gust Factor Used in Analysis

G = Gust Factor: Min(G_1, G_2) = 0.850

Wall Wind Pressures [Parallel to Ridge]
All wind pressures include a Load Factor (LF) of 0.6

Elev ft	GC_{pi}	q_i psf	K_z	K_{zt}	q_z psf	Windward Press psf	Leeward Press psf	Side Press psf	Total Press psf	Minimum Pressure* psf
27.670	Parapet	44.79	0.964	1.000	45.37	57.84	-38.56	0.00	96.41	9.60
26.000	+0.18	44.79	0.952	1.000	44.79	19.04	-21.68	-29.51	40.72	9.60
21.000	+0.18	44.79	0.912	1.000	42.88	17.93	-21.68	-29.51	39.62	9.60
16.000	+0.18	44.79	0.862	1.000	40.57	16.60	-21.68	-29.51	38.28	9.60
11.000	+0.18	44.79	0.851	1.000	40.04	16.29	-21.68	-29.51	37.97	9.60
6.000	+0.18	44.79	0.851	1.000	40.04	16.29	-21.68	-29.51	37.97	9.60
1.000	+0.18	44.79	0.851	1.000	40.04	16.29	-21.68	-29.51	37.97	9.60
27.670	Parapet	44.79	0.964	1.000	45.37	57.84	-38.56	0.00	96.41	9.60
26.000	-0.18	44.79	0.952	1.000	44.79	32.74	-7.98	-15.80	40.72	9.60
21.000	-0.18	44.79	0.912	1.000	42.88	31.64	-7.98	-15.80	39.62	9.60
16.000	-0.18	44.79	0.862	1.000	40.57	30.30	-7.98	-15.80	38.28	9.60
11.000	-0.18	44.79	0.851	1.000	40.04	30.00	-7.98	-15.80	37.97	9.60
6.000	-0.18	44.79	0.851	1.000	40.04	30.00	-7.98	-15.80	37.97	9.60
1.000	-0.18	44.79	0.851	1.000	40.04	30.00	-7.98	-15.80	37.97	9.60

K_z = $2.41\bullet(Z/Z_g)^{2/\alpha}$
GC_{pi} = +Internal Coef $_{T:26.13-1}$
q_{ip} = For +GC_{pi} use q_h
Side = $q_h\bullet K_d\bullet G\bullet Cp_{SW}-q_{ip}\bullet K_d\bullet(GC_{pi+})$ E:27.3-1
Windward = $q_z\bullet K_d\bullet G\bullet Cp_{WW}-q_{ip}\bullet K_d\bullet(GC_{pi+})$ E:27.3-1
+Press = Pressure Acting Toward Surface
§27.1.5 = MWFRS Min Wall Pressure = 9.60 psf
p_p = $q_h\bullet K_d\bullet(GC_{pn_lw})$ E:27.3-3

K_{zt} = No Topographic Feature
q_z = $.00256\bullet K_z\bullet K_{zt}\bullet K_e\bullet V^2\bullet LF_{E:26.10-1}$
q_{in} = Negative Internal Pressure: q_h
Leeward = $q_h\bullet K_d\bullet G\bullet Cp_{LW}-q_{ip}\bullet K_d\bullet(GC_{pi+})$ E:27.3-1
Total = Windward - Leeward
-Press = Pressure Acting Away from Surface
p_p = $q_h\bullet K_d\bullet(GC_{pn_ww})$ E:27.3-3

Roof Wind Pressures [Parallel to Ridge]
All wind pressures include a Load Factor (LF) of 0.6

Component	Description	Location	Start ft	End ft	θ °	Basis	GC_{pi}	C_{pMin}	C_{pMax}	P_{min} psf	P_{max} psf	P_{min} psf
Roof	Roof 0 to h	All	0.000	26.000	0.0	P	+0.18	-0.9	-0.18	-35.98	-12.68	4.80
Roof	Roof h to 2•h	All	26.000	52.000	0.0	P	+0.18	-0.5	-0.18	-23.04	-12.68	4.80
Roof	Roof ≥ 2•h	All	52.000	133.000	0.0	P	+0.18	-0.3	-0.18	-16.56	-12.68	4.80
Roof	Roof 0 to h	All	0.000	26.000	0.0	P	-0.18	-0.9	-0.18	-22.27	1.03	4.80
Roof	Roof h to 2•h	All	26.000	52.000	0.0	P	-0.18	-0.5	-0.18	-9.33	1.03	4.80
Roof	Roof ≥ 2•h	All	52.000	133.000	0.0	P	-0.18	-0.3	-0.18	-2.86	1.03	4.80

Roof Pressures based upon Ch 27:
Component = The building component for pressures
Start = Start Dist from Windward Edge
C_{pMin} = Smallest Coefficient Magnitude
P_{min} = $q_h \cdot K_d \cdot G \cdot C_{pMin} - q_{ip} \cdot K_d \cdot GC_{piE:27.3-1}$
GC_{pi} = +Internal Coef $_{T:26.13-1}$
P_{min} = Min Press projected on vertical plane $_{§27.1.5}$
§27.1.5 = MWFRS Min Wall Pressure = 9.60 psf
-Press = Pressure Acting Away from Surface
Location = Reference Graphic in Output for Values
End = End Dist from Windward Edge
C_{pMax} = Largest Coefficient Magnitude
P_{max} = $q_h \cdot K_d \cdot G \cdot C_{pMax} - q_{in} \cdot K_d \cdot GC_{piE:27.3-1}$
Basis = P=Parallel to Ridge: N=Normal to Ridge
θ = Roof Slope Relative to Wind
+Press = Pressure Acting Toward Surface

• The smaller uplift pressures due to C_{pMin} can become critical when wind is combined with roof live load or snow load; load combinations are given in ASCE 7

Reactions Wind Walls+Roof +GCPi: [Parallel to Ridge]

Description	Pressure psf	Area ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	183.70	-66.50	0.00	-26.84	-7.08	0.00	0.00	0.00	-190.10	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-23.50	-11.93	0.00	0.00	0.00	-280.24	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-18.50	-11.93	0.00	0.00	0.00	-220.62	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-13.50	-11.93	0.00	0.00	0.00	-160.99	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-8.50	-11.93	0.00	0.00	0.00	-101.36	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-3.50	-11.93	0.00	0.00	0.00	-41.74	0.00
Leeward Wall	-21.68	110.00	-66.50	0.00	-0.50	-2.39	0.00	0.00	0.00	-1.19	0.00
Roof	-16.56	8,910.00	-26.00	0.00	-26.00	0.00	0.00	-147.57	0.00	3,836.95	0.00
Roof	-23.04	2,860.00	27.50	0.00	-26.00	0.00	0.00	-65.88	0.00	-1,811.76	0.00
Roof	-35.98	1,430.00	60.00	0.00	-26.00	0.00	0.00	-51.45	0.00	-3,087.20	0.00
Roof	-35.98	1,430.00	47.00	0.00	-26.00	0.00	0.00	-51.45	0.00	-2,418.31	0.00
Side Wall	-29.51	665.00	0.00	55.00	-23.50	0.00	19.62	0.00	-461.14	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-23.50	0.00	-19.62	0.00	461.14	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-18.50	0.00	19.62	0.00	-363.03	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-18.50	0.00	-19.62	0.00	363.03	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-13.50	0.00	19.62	0.00	-264.91	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-13.50	0.00	-19.62	0.00	264.91	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-8.50	0.00	19.62	0.00	-166.80	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-8.50	0.00	-19.62	0.00	166.80	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-3.50	0.00	19.62	0.00	-68.68	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-3.50	0.00	-19.62	0.00	68.68	0.00	0.00
Side Wall	-29.51	133.00	0.00	55.00	-0.50	0.00	3.92	0.00	-1.96	0.00	0.00
Side Wall	-29.51	133.00	0.00	-55.00	-0.50	0.00	-3.92	0.00	1.96	0.00	0.00
Windward Parapet	57.84	183.70	66.50	0.00	-26.84	-10.63	0.00	0.00	0.00	-285.14	0.00
Windward Wall	19.04	550.00	66.50	0.00	-23.50	-10.47	0.00	0.00	0.00	-246.06	0.00
Windward Wall	17.93	550.00	66.50	0.00	-18.50	-9.86	0.00	0.00	0.00	-182.47	0.00
Windward Wall	16.60	550.00	66.50	0.00	-13.50	-9.13	0.00	0.00	0.00	-123.22	0.00
Windward Wall	16.29	550.00	66.50	0.00	-8.50	-8.96	0.00	0.00	0.00	-76.15	0.00
Windward Wall	16.29	550.00	66.50	0.00	-3.50	-8.96	0.00	0.00	0.00	-31.36	0.00
Windward Wall	16.29	110.00	66.50	0.00	-0.50	-1.79	0.00	0.00	0.00	-0.90	0.00
Total		27,633.40				-128.89		-316.36		-5,421.86	

Reactions Wind Walls Only +GCPi: [Parallel to Ridge]

Description	Pressure psf	Area ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	183.70	-66.50	0.00	-26.84	-7.08	0.00	0.00	0.00	-190.10	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-23.50	-11.93	0.00	0.00	0.00	-280.24	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-18.50	-11.93	0.00	0.00	0.00	-220.62	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-13.50	-11.93	0.00	0.00	0.00	-160.99	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-8.50	-11.93	0.00	0.00	0.00	-101.36	0.00
Leeward Wall	-21.68	550.00	-66.50	0.00	-3.50	-11.93	0.00	0.00	0.00	-41.74	0.00
Leeward Wall	-21.68	110.00	-66.50	0.00	-0.50	-2.39	0.00	0.00	0.00	-1.19	0.00
Side Wall	-29.51	665.00	0.00	55.00	-23.50	0.00	19.62	0.00	-461.14	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-23.50	0.00	-19.62	0.00	461.14	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-18.50	0.00	19.62	0.00	-363.03	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-18.50	0.00	-19.62	0.00	363.03	0.00	0.00

Side Wall	-29.51	665.00	0.00	55.00	-13.50	0.00	19.62	0.00	-264.91	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-13.50	0.00	-19.62	0.00	264.91	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-8.50	0.00	19.62	0.00	-166.80	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-8.50	0.00	-19.62	0.00	166.80	0.00	0.00
Side Wall	-29.51	665.00	0.00	55.00	-3.50	0.00	19.62	0.00	-68.68	0.00	0.00
Side Wall	-29.51	665.00	0.00	-55.00	-3.50	0.00	-19.62	0.00	68.68	0.00	0.00
Side Wall	-29.51	133.00	0.00	55.00	-0.50	0.00	3.92	0.00	-1.96	0.00	0.00
Side Wall	-29.51	133.00	0.00	-55.00	-0.50	0.00	-3.92	0.00	1.96	0.00	0.00
Windward Parapet	57.84	183.70	66.50	0.00	-26.84	-10.63	0.00	0.00	0.00	-285.14	0.00
Windward Wall	19.04	550.00	66.50	0.00	-23.50	-10.47	0.00	0.00	0.00	-246.06	0.00
Windward Wall	17.93	550.00	66.50	0.00	-18.50	-9.86	0.00	0.00	0.00	-182.47	0.00
Windward Wall	16.60	550.00	66.50	0.00	-13.50	-9.13	0.00	0.00	0.00	-123.22	0.00
Windward Wall	16.29	550.00	66.50	0.00	-8.50	-8.96	0.00	0.00	0.00	-76.15	0.00
Windward Wall	16.29	550.00	66.50	0.00	-3.50	-8.96	0.00	0.00	0.00	-31.36	0.00
Windward Wall	16.29	110.00	66.50	0.00	-0.50	-1.79	0.00	0.00	0.00	-0.90	0.00
Total		13,003.40				-128.89				-1,941.55	

Reactions Wind Walls+Roof -GCPi: [Parallel to Ridge]

Description	Pressure psf	Area ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	183.70	-66.50	0.00	-26.84	-7.08	0.00	0.00	0.00	-190.10	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-23.50	-4.39	0.00	0.00	0.00	-103.08	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-18.50	-4.39	0.00	0.00	0.00	-81.15	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-13.50	-4.39	0.00	0.00	0.00	-59.22	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-8.50	-4.39	0.00	0.00	0.00	-37.28	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-3.50	-4.39	0.00	0.00	0.00	-15.35	0.00
Leeward Wall	-7.98	110.00	-66.50	0.00	-0.50	-0.88	0.00	0.00	0.00	-0.44	0.00
Roof	1.03	8,910.00	-26.00	0.00	-26.00	0.00	0.00	9.16	0.00	-238.16	0.00
Roof	1.03	2,860.00	27.50	0.00	-26.00	0.00	0.00	2.94	0.00	80.86	0.00
Roof	1.03	1,430.00	60.00	0.00	-26.00	0.00	0.00	1.47	0.00	88.21	0.00
Roof	1.03	1,430.00	47.00	0.00	-26.00	0.00	0.00	1.47	0.00	69.09	0.00
Side Wall	-15.80	665.00	0.00	55.00	-23.50	0.00	10.51	0.00	-246.94	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-23.50	0.00	-10.51	0.00	246.94	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-18.50	0.00	10.51	0.00	-194.40	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-18.50	0.00	-10.51	0.00	194.40	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-13.50	0.00	10.51	0.00	-141.86	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-13.50	0.00	-10.51	0.00	141.86	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-8.50	0.00	10.51	0.00	-89.32	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-8.50	0.00	-10.51	0.00	89.32	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-3.50	0.00	10.51	0.00	-36.78	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-3.50	0.00	-10.51	0.00	36.78	0.00	0.00
Side Wall	-15.80	133.00	0.00	55.00	-0.50	0.00	2.10	0.00	-1.05	0.00	0.00
Side Wall	-15.80	133.00	0.00	-55.00	-0.50	0.00	-2.10	0.00	1.05	0.00	0.00
Windward Parapet	57.84	183.70	66.50	0.00	-26.84	-10.63	0.00	0.00	0.00	-285.14	0.00
Windward Wall	32.74	550.00	66.50	0.00	-23.50	-18.01	0.00	0.00	0.00	-423.23	0.00
Windward Wall	31.64	550.00	66.50	0.00	-18.50	-17.40	0.00	0.00	0.00	-321.94	0.00
Windward Wall	30.30	550.00	66.50	0.00	-13.50	-16.67	0.00	0.00	0.00	-225.00	0.00
Windward Wall	30.00	550.00	66.50	0.00	-8.50	-16.50	0.00	0.00	0.00	-140.23	0.00
Windward Wall	30.00	550.00	66.50	0.00	-3.50	-16.50	0.00	0.00	0.00	-57.74	0.00
Windward Wall	30.00	110.00	66.50	0.00	-0.50	-3.30	0.00	0.00	0.00	-1.65	0.00
Total		27,633.40				-128.89		15.04		-1,941.55	

Reactions Wind Walls Only -GCPi: [Parallel to Ridge]

Description	Pressure psf	Area ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Leeward Parapet	-38.56	183.70	-66.50	0.00	-26.84	-7.08	0.00	0.00	0.00	-190.10	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-23.50	-4.39	0.00	0.00	0.00	-103.08	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-18.50	-4.39	0.00	0.00	0.00	-81.15	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-13.50	-4.39	0.00	0.00	0.00	-59.22	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-8.50	-4.39	0.00	0.00	0.00	-37.28	0.00
Leeward Wall	-7.98	550.00	-66.50	0.00	-3.50	-4.39	0.00	0.00	0.00	-15.35	0.00
Leeward Wall	-7.98	110.00	-66.50	0.00	-0.50	-0.88	0.00	0.00	0.00	-0.44	0.00
Side Wall	-15.80	665.00	0.00	55.00	-23.50	0.00	10.51	0.00	-246.94	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-23.50	0.00	-10.51	0.00	246.94	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-18.50	0.00	10.51	0.00	-194.40	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-18.50	0.00	-10.51	0.00	194.40	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-13.50	0.00	10.51	0.00	-141.86	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-13.50	0.00	-10.51	0.00	141.86	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-8.50	0.00	10.51	0.00	-89.32	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-8.50	0.00	-10.51	0.00	89.32	0.00	0.00
Side Wall	-15.80	665.00	0.00	55.00	-3.50	0.00	10.51	0.00	-36.78	0.00	0.00
Side Wall	-15.80	665.00	0.00	-55.00	-3.50	0.00	-10.51	0.00	36.78	0.00	0.00
Side Wall	-15.80	133.00	0.00	55.00	-0.50	0.00	2.10	0.00	-1.05	0.00	0.00

Side Wall	-15.80	133.00	0.00	-55.00	-0.50	0.00	-2.10	0.00	1.05	0.00	0.00
Windward Parapet	57.84	183.70	66.50	0.00	-26.84	-10.63	0.00	0.00	0.00	-285.14	0.00
Windward Wall	32.74	550.00	66.50	0.00	-23.50	-18.01	0.00	0.00	0.00	-423.23	0.00
Windward Wall	31.64	550.00	66.50	0.00	-18.50	-17.40	0.00	0.00	0.00	-321.94	0.00
Windward Wall	30.30	550.00	66.50	0.00	-13.50	-16.67	0.00	0.00	0.00	-225.00	0.00
Windward Wall	30.00	550.00	66.50	0.00	-8.50	-16.50	0.00	0.00	0.00	-140.23	0.00
Windward Wall	30.00	550.00	66.50	0.00	-3.50	-16.50	0.00	0.00	0.00	-57.74	0.00
Windward Wall	30.00	110.00	66.50	0.00	-0.50	-3.30	0.00	0.00	0.00	-1.65	0.00
Total		13,003.40				-128.89				-1,941.55	

Reactions Wind Walls+Roof Min Pressure: [Parallel to Ridge]

Description	Pressure psf	Area* ft^2	X_c ft	Y_c ft	Z_c ft	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Windward Parapet	9.60	183.70	66.50	0.00	-26.84	-1.76	0.00	0.00	0.00	-47.32	0.00
Windward Wall	9.60	550.00	66.50	0.00	-23.50	-5.28	0.00	0.00	0.00	-124.08	0.00
Windward Wall	9.60	550.00	66.50	0.00	-18.50	-5.28	0.00	0.00	0.00	-97.68	0.00
Windward Wall	9.60	550.00	66.50	0.00	-13.50	-5.28	0.00	0.00	0.00	-71.28	0.00
Windward Wall	9.60	550.00	66.50	0.00	-8.50	-5.28	0.00	0.00	0.00	-44.88	0.00
Windward Wall	9.60	550.00	66.50	0.00	-3.50	-5.28	0.00	0.00	0.00	-18.48	0.00
Windward Wall	9.60	110.00	66.50	0.00	-0.50	-1.06	0.00	0.00	0.00	-0.53	0.00
Total		3,043.70				-29.22				-404.25	

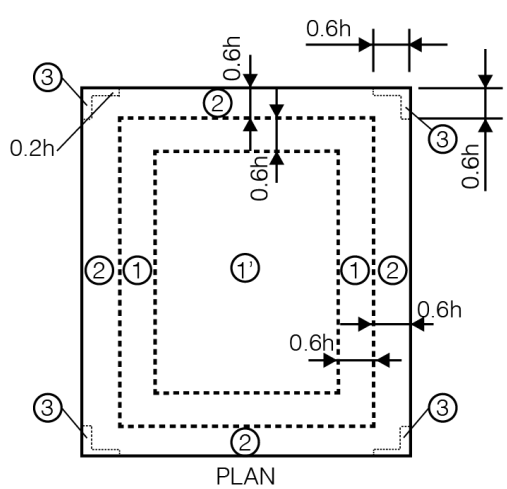
Notes:
Moments are calculated relative to the origin (0,0,0) of the building
X= Along Building ridge, Y = Normal to Building Ridge, Z = Vertical
X_c = X Distance from Origin (0,0,0) to the center of the Component being considered
Y_c = Y Distance from Origin (0,0,0) to the center of the Component being considered
Z_c = Z Distance from Origin (0,0,0) to the center of the Component being considered
Moments calculated using cross product of Force Vector (F_x, F_y, F_z) with Moment Vector (X_c, Y_c, Z_c)
MIN = Minimum pressures on Walls = 9.60 psf and Roof = 4.80 psf
Area* = Area of the surface projected onto a vertical plane normal to wind.

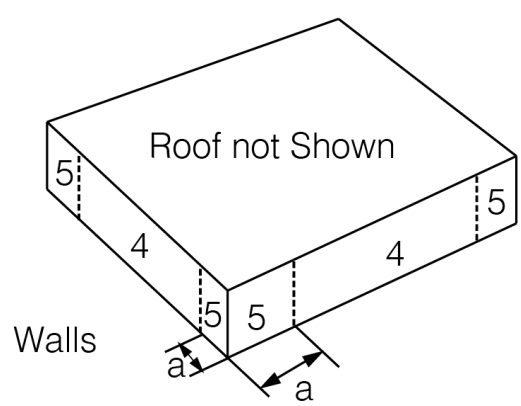
Reaction Summary Wind (MWFRS)

Description	F_x Kip	F_y Kip	F_z Kip	M_x k•ft	M_y k•ft	M_z k•ft
Normal to Ridge: Walls+Roof|+GCPi	0.00	-160.52	-331.85	5,586.74	0.00	0.00
Normal to Ridge: Walls Only|+GCPi	0.00	-160.52	0.00	2,408.35	0.00	0.00
Normal to Ridge: Walls+Roof|-GCPi	0.00	-160.52	15.04	2,408.35	0.00	0.00
Normal to Ridge: Walls Only|-GCPi	0.00	-160.52	0.00	2,408.35	0.00	0.00
Normal to Ridge: Walls+Roof|Min Pressure	0.00	-35.33	0.00	488.78	0.00	0.00
Parallel to Ridge: Walls+Roof|+GCPi	-128.89	0.00	-316.36	0.00	-5,421.86	0.00
Parallel to Ridge: Walls Only|+GCPi	-128.89	0.00	0.00	0.00	-1,941.55	0.00
Parallel to Ridge: Walls+Roof|-GCPi	-128.89	0.00	15.04	0.00	-1,941.55	0.00
Parallel to Ridge: Walls Only|-GCPi	-128.89	0.00	0.00	0.00	-1,941.55	0.00
Parallel to Ridge: Walls+Roof|Min Pressure	-29.22	0.00	0.00	0.00	-404.25	0.00

** Per F:27.3-1, Use greater of Shear calculated with or without roof.*
** X= Along Building ridge, Y = Normal to Building Ridge, Z = Vertical*
** Minimum Pressures applied to a vertical plane normal to wind.*
** Reactions calculated about the geometric center of the footprint*

Components and Cladding (C&C) Wind Loads per Ch 30 Pt 1 Roof & Wall





h = Mean structure height	= 26.000 ft	$K_h = 2.41 \cdot (Z/Z_g)^{2/\alpha}$	= 0.952
K_{zt} = No Topographic Feature	= 1.000	K_d = Directionality Factor $_{T:26.6-1}$	= 0.85
GC_{pi} = ± Internal Press Coef $_{T:26.13-1}$	= ±0.18	LF = ASD Load Factor	= 0.60
K_e = Ground Elev Factor $_{T:26.10-1}$	= 1.000	$q_h = .00256 \cdot K_h \cdot K_{zt} \cdot K_e \cdot V^2 \cdot LF_{E:26.10-1}$	= 44.79 psf
θ = Slope of Roof	= 0.00 °	a_1 = Min(0.1•B, 0.4•h)	= 10.400 ft
a = Max(a_1, 0.04•B, 3 ft [0.9 m])	= 10.400 ft	0.2•h = Zone 3 Parameter	= 5.2000 ft
0.6•h = Zone 1 & 2 Parameter	= 15.6000 ft		

C&C Wind Roof & Wall Detailed per Ch 30 Pt 1
All wind pressures include a Load Factor (LF) of 0.6

Description	Zone	Width ft	Span ft	Area ft^2	1/3 Rule	Reference	a ft	GC_{pi}	GC_{pd}	GC_{pu}	P_{max} psf	P_{min} psf
10 sq. ft.	1'	1.0000	5.5000	10.08	Yes	F:30.3-2A	15.6	±0.18	0.30	-0.90	18.26	-41.12
10 sq. ft.	1	1.0000	5.5000	10.08	Yes	F:30.3-2A	15.6	±0.18	0.30	-1.70	18.26	-71.53
10 sq. ft.	2	1.0000	5.5000	10.08	Yes	F:30.3-2A	15.6	±0.18	0.30	-2.30	18.26	-94.35
10 sq. ft.	3	1.0000	5.5000	10.08	Yes	F:30.3-2A	15.6	±0.18	0.30	-3.20	18.26	-128.55
10 sq. ft.	4	1.0000	5.5000	10.08	Yes	F:30.3-1*	15.6	±0.18	0.90	-0.99	41.10	-44.53
10 sq. ft.	5	1.0000	5.5000	10.08	Yes	F:30.3-1*	15.6	±0.18	0.90	-1.26	41.10	-54.79
20 sq. ft.	1'	1.0000	7.7500	20.02	Yes	F:30.3-2A	15.6	±0.18	0.27	-0.90	17.13	-41.12
20 sq. ft.	1	1.0000	7.7500	20.02	Yes	F:30.3-2A	15.6	±0.18	0.27	-1.58	17.13	-66.85
20 sq. ft.	2	1.0000	7.7500	20.02	Yes	F:30.3-2A	15.6	±0.18	0.27	-2.14	17.13	-88.35
20 sq. ft.	3	1.0000	7.7500	20.02	Yes	F:30.3-2A	15.6	±0.18	0.27	-2.88	17.13	-116.53
20 sq. ft.	4	1.0000	7.7500	20.02	Yes	F:30.3-1*	15.6	±0.18	0.85	-0.94	39.30	-42.72
20 sq. ft.	5	1.0000	7.7500	20.02	Yes	F:30.3-1*	15.6	±0.18	0.85	-1.16	39.30	-51.18
50 sq. ft.	1'	1.0000	12.0000	48.00	Yes	F:30.3-2A	15.6	±0.18	0.23	-0.90	15.68	-41.12
50 sq. ft.	1	1.0000	12.0000	48.00	Yes	F:30.3-2A	15.6	±0.18	0.23	-1.42	15.68	-60.89
50 sq. ft.	2	1.0000	12.0000	48.00	Yes	F:30.3-2A	15.6	±0.18	0.23	-1.94	15.68	-80.69
50 sq. ft.	3	1.0000	12.0000	48.00	Yes	F:30.3-2A	15.6	±0.18	0.23	-2.48	15.68	-101.21
50 sq. ft.	4	1.0000	12.0000	48.00	Yes	F:30.3-1*	15.6	±0.18	0.79	-0.88	37.00	-40.43
50 sq. ft.	5	1.0000	12.0000	48.00	Yes	F:30.3-1*	15.6	±0.18	0.79	-1.04	37.00	-46.58
100 sq. ft.	1'	1.0000	18.0000	108.00	Yes	F:30.3-2A	15.6	±0.18	0.20	-0.88	14.47	-40.49
100 sq. ft.	1	1.0000	18.0000	108.00	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.27	14.47	-55.37
100 sq. ft.	2	1.0000	18.0000	108.00	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.75	14.47	-73.58
100 sq. ft.	3	1.0000	18.0000	108.00	Yes	F:30.3-2A	15.6	±0.18	0.20	-2.11	14.47	-87.01
100 sq. ft.	4	1.0000	18.0000	108.00	Yes	F:30.3-1*	15.6	±0.18	0.74	-0.83	34.87	-38.30
100 sq. ft.	5	1.0000	18.0000	108.00	Yes	F:30.3-1*	15.6	±0.18	0.74	-0.93	34.87	-42.32
200 sq. ft.	1'	1.0000	25.0000	208.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-0.74	14.47	-35.05
200 sq. ft.	1	1.0000	25.0000	208.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.16	14.47	-50.89
200 sq. ft.	2	1.0000	25.0000	208.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.60	14.47	-67.83
200 sq. ft.	3	1.0000	25.0000	208.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.80	14.47	-75.50
200 sq. ft.	4	1.0000	25.0000	208.33	Yes	F:30.3-1*	15.6	±0.18	0.69	-0.78	33.14	-36.57
200 sq. ft.	5	1.0000	25.0000	208.33	Yes	F:30.3-1*	15.6	±0.18	0.69	-0.84	33.14	-38.87
500 sq. ft.	1'	1.0000	40.0000	533.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-0.54	14.47	-27.28
500 sq. ft.	1	1.0000	40.0000	533.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.00	14.47	-44.93
500 sq. ft.	2	1.0000	40.0000	533.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.40	14.47	-60.16
500 sq. ft.	3	1.0000	40.0000	533.33	Yes	F:30.3-2A	15.6	±0.18	0.20	-1.40	14.47	-60.16
500 sq. ft.	4	1.0000	40.0000	533.33	Yes	F:30.3-1*	15.6	±0.18	0.63	-0.72	30.84	-34.27
500 sq. ft.	5	1.0000	40.0000	533.33	Yes	F:30.3-1*	15.6	±0.18	0.63	-0.72	30.84	-34.27

GC_{pd} = Down (+) External Coefficient
P_{max} = $q_h \cdot K_d \cdot [GC_{pd} - GC_{pi}]$ $[_{E:30.3-1}]$
+Press = Pressure Acting Toward Surface
§30.2.2 = C&C Min Pressure = 9.60 psf
Width = Width of Component
Area = Span • Width
a = Zone 2 width: 0.6•h $_{F:30.3-2A}$
GC_{pi} = Internal Coef $_{T:26.13-1}$
*F:30.3-1 = *Since θ≤10°: Zone 4 & 5 GC_p reduced 10%*

GC_{pu} = Uplift (-) External Coefficient
P_{min} = $q_h \cdot K_d \cdot [GC_{pu} - GC_{pi}]$ $[_{E:30.3-1}]$
-Press = Pressure Acting Away from Surface
Zone = Applicable Zone per Figure
Span = Span of Component
1/3 Rule = Width limited to Span/3
a = Zone 2 width: 0.6•h $_{F:30.3-1}$
Reference = Applicable Reference from Standard

C&C Wind Roof & Wall Summary per Ch 30 Pt 1

Zone	Reference	P_{max} A ≤ 10 ft^2 psf	P_{min} A ≤ 10 ft^2 psf	P_{max} A = 20 ft^2 psf	P_{min} A = 20 ft^2 psf	P_{max} A = 50 ft^2 psf	P_{min} A = 50 ft^2 psf	P_{max} A = 100 ft^2 psf	P_{min} A = 100 ft^2 psf
1'	F:30.3-2A	18.28	-41.12	17.13	-41.12	15.61	-41.12	14.47	-41.12

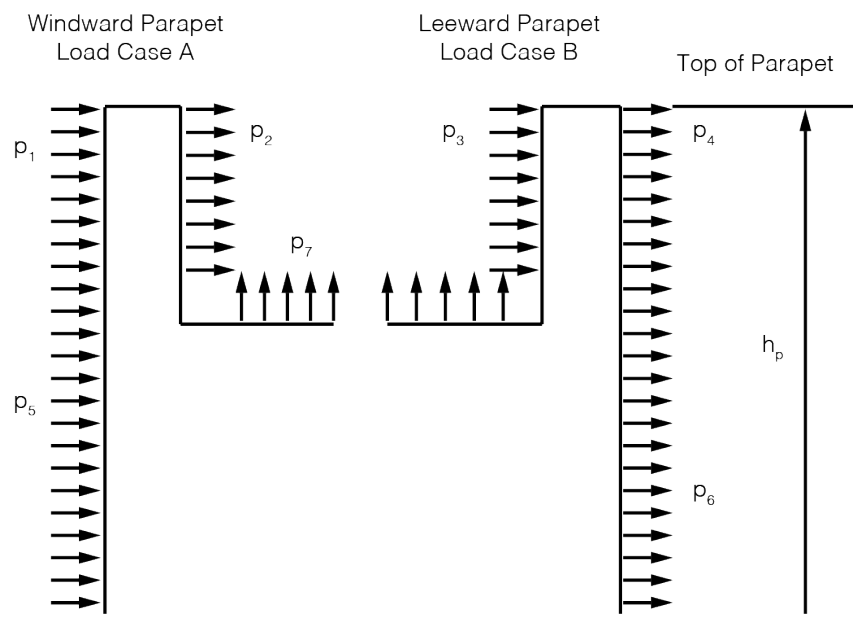
1	F:30.3-2A	18.28	-71.58	17.13	-66.86	15.61	-60.62	14.47	-55.89
2	F:30.3-2A	18.28	-94.43	17.13	-88.36	15.61	-80.33	14.47	-74.26
3	F:30.3-2A	18.28	-128.70	17.13	-116.55	15.61	-100.50	14.47	-88.36
4	F:30.3-1*	41.12	-44.55	39.30	-42.73	36.89	-40.32	35.07	-38.50
5	F:30.3-1*	41.12	-54.83	39.30	-51.19	36.89	-46.37	35.07	-42.73

Zone	Reference	P_{max} A = 200 ft² psf	P_{min} A = 200 ft² psf	P_{max} A = 500 ft² psf	P_{min} A = 500 ft² psf	P_{max} A > 1,000 ft² psf	P_{min} A > 1,000 ft² psf
1'	F:30.3-2A	14.47	-35.39	14.47	-27.81	14.47	-22.08
1	F:30.3-2A	14.47	-51.17	14.47	-44.93	14.47	-44.93
2	F:30.3-2A	14.47	-68.19	14.47	-60.16	14.47	-60.16
3	F:30.3-2A	14.47	-76.21	14.47	-60.16	14.47	-60.16
4	F:30.3-1*	33.25	-36.68	30.84	-34.27	30.84	-34.27
5	F:30.3-1*	33.25	-39.08	30.84	-34.27	30.84	-34.27

P_{max} = Maximum Pressure
Area = Span • Width
Span = Span of Component
§30.2.2 = C&C Min Pressure = 9.60 psf

P_{min} = Minimum Pressure
Width = Width of Component
Reference = Applicable Reference from Standard
Interpolate = Interpolate for Areas between columns

Components and Cladding (C&C) Wind Loads per Ch 30 Pt 6 Parapet



C&C Wind Roof & Wall Summary per Ch 30 Pt 6

Zone	Reference	P_{max} A ≤ 10 ft² psf	P_{min} A ≤ 10 ft² psf	P_{max} A = 20 ft² psf	P_{min} A = 20 ft² psf	P_{max} A = 50 ft² psf	P_{min} A = 50 ft² psf	P_{max} A = 100 ft² psf	P_{min} A = 100 ft² psf
4_P ($P_1/P_3/P_5$)	F:30.3-1/F:30.3-2A	34.71	0.00	32.86	0.00	30.42	0.00	28.58	0.00
4_P (P_2/P_7)	F:30.3-1/F:30.3-2A	0.00	-88.69	0.00	-82.54	0.00	-74.41	0.00	-68.27
4_P (P_4/P_6)	F:30.3-1/F:30.3-2A	0.00	-38.18	0.00	-36.33	0.00	-33.89	0.00	-32.05
4_P (P_{netA})	F:30.3-1/F:30.3-2A	123.40	0.00	115.41	0.00	104.84	0.00	96.84	0.00
4_P (P_{netB})	F:30.3-1/F:30.3-2A	72.88	0.00	69.19	0.00	64.32	0.00	60.63	0.00
5_P ($P_1/P_3/P_5$)	F:30.3-1/F:30.3-2A	34.71	0.00	32.86	0.00	30.42	0.00	28.58	0.00
5_P (P_2/P_7)	F:30.3-1/F:30.3-2A	0.00	-123.40	0.00	-111.10	0.00	-94.84	0.00	-82.54
5_P (P_4/P_6)	F:30.3-1/F:30.3-2A	0.00	-48.59	0.00	-44.90	0.00	-40.02	0.00	-36.33
5_P (P_{netA})	F:30.3-1/F:30.3-2A	158.11	0.00	143.96	0.00	125.27	0.00	111.12	0.00
5_P (P_{netB})	F:30.3-1/F:30.3-2A	83.29	0.00	77.76	0.00	70.44	0.00	64.91	0.00

Zone	Reference	P_{max} A = 200 ft^2 psf	P_{min} A = 200 ft^2 psf	P_{max} A = 500 ft^2 psf	P_{min} A = 500 ft^2 psf	P_{max} A > 1,000 ft^2 psf	P_{min} A > 1,000 ft^2 psf
4_P ($P_1/P_3/P_5$)	F:30.3-1/F:30.3-2A	26.73	0.00	24.29	0.00	24.29	0.00
4_P (P_2/P_7)	F:30.3-1/F:30.3-2A	0.00	-62.12	0.00	-53.99	0.00	-53.99
4_P (P_4/P_6)	F:30.3-1/F:30.3-2A	0.00	-30.20	0.00	-27.76	0.00	-27.76
4_P (P_{netA})	F:30.3-1/F:30.3-2A	88.85	0.00	78.28	0.00	78.28	0.00
4_P (P_{netB})	F:30.3-1/F:30.3-2A	56.94	0.00	52.06	0.00	52.06	0.00
5_P ($P_1/P_3/P_5$)	F:30.3-1/F:30.3-2A	26.73	0.00	24.29	0.00	24.29	0.00
5_P (P_2/P_7)	F:30.3-1/F:30.3-2A	0.00	-70.25	0.00	-53.99	0.00	-53.99
5_P (P_4/P_6)	F:30.3-1/F:30.3-2A	0.00	-32.64	0.00	-27.76	0.00	-27.76
5_P (P_{netA})	F:30.3-1/F:30.3-2A	96.98	0.00	78.28	0.00	78.28	0.00
5_P (P_{netB})	F:30.3-1/F:30.3-2A	59.38	0.00	52.06	0.00	52.06	0.00

P_{max} = Maximum Pressure
Area = Span • Width
Span = Span of Component
§30.2.2 = C&C Min Pressure = 9.60 psf
P_2/P_7 = $q_p \cdot K_d \cdot (GC_{p2} - GC_{pip})$ E:30.6-1
P_{netA} = Load Case A Windward Net Press: $P_1 - P_2$
Interpolate = Interpolate for Areas between columns

P_{min} = Minimum Pressure
Width = Width of Component
Reference = Applicable Reference from Standard
$P_1/P_3/P_5$ = $q_p \cdot K_d \cdot (GC_{p1} - GC_{pip})$ E:30.6-1
P_4/P_6 = $q_p \cdot K_d \cdot (GC_{p4} - GC_{pip})$ E:30.6-1
P_{netB} = Load Case B Leeward Net Press: $P_3 - P_4$

PALACIOS
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Roof Concrete Slab Design

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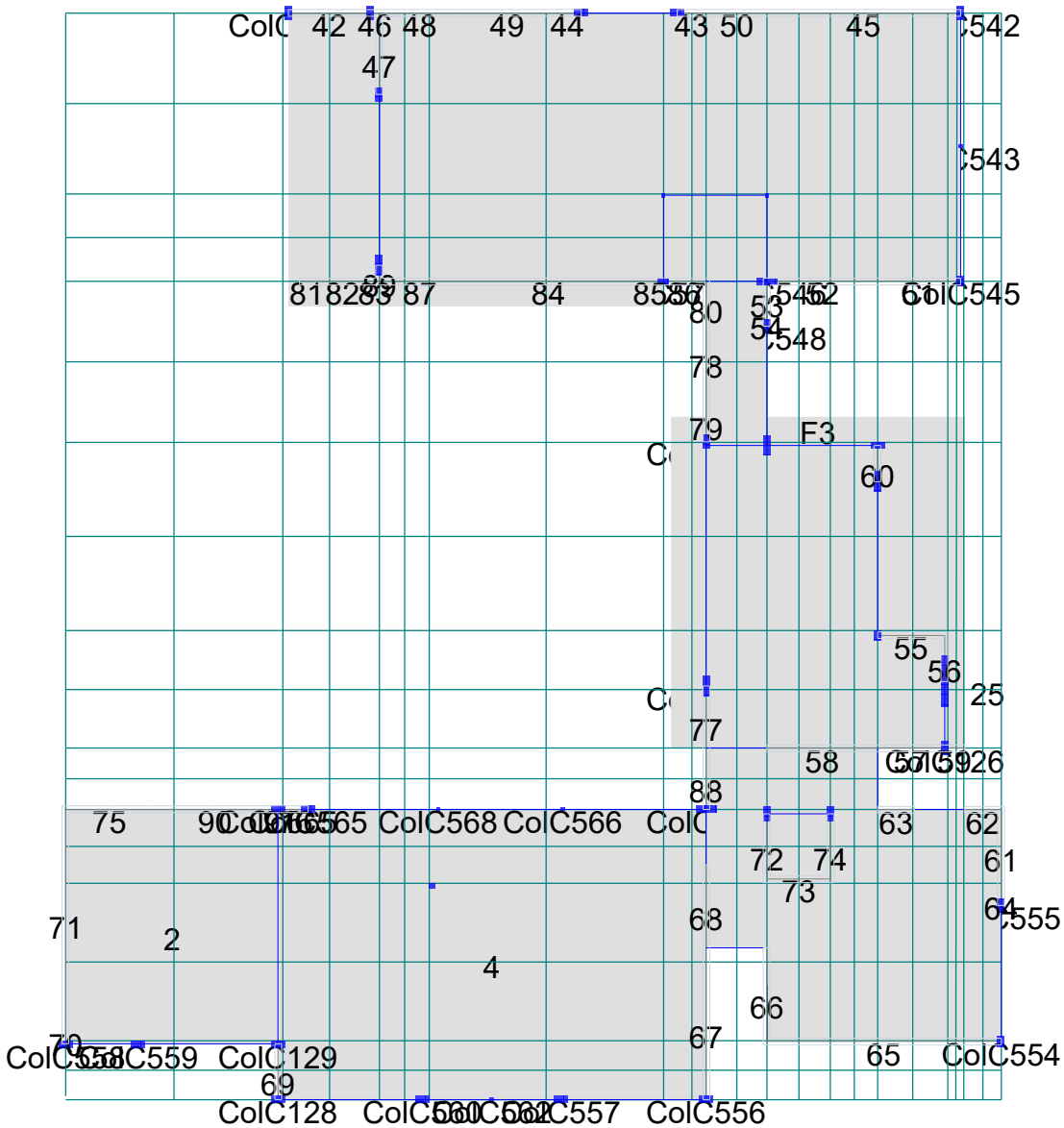
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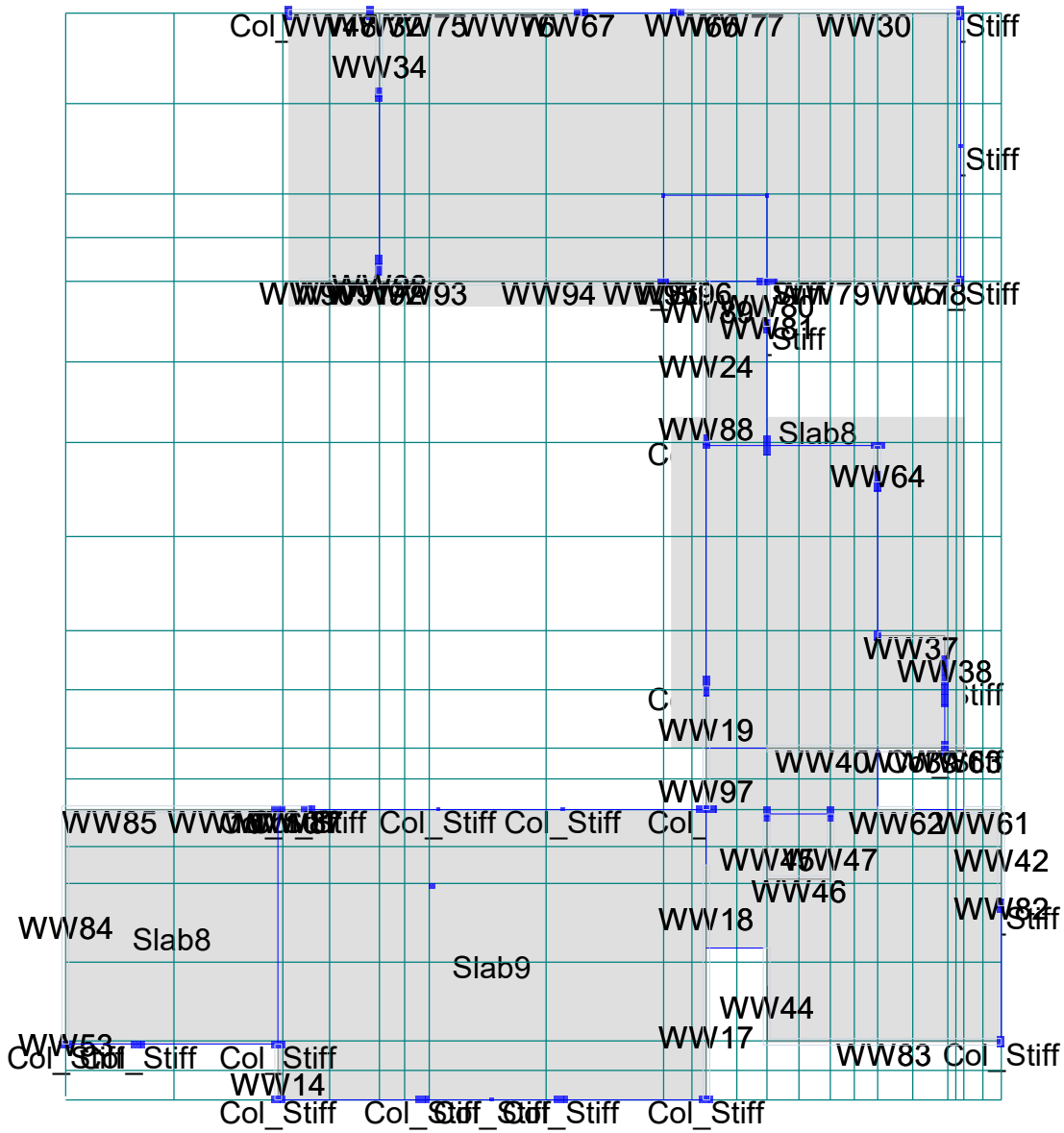
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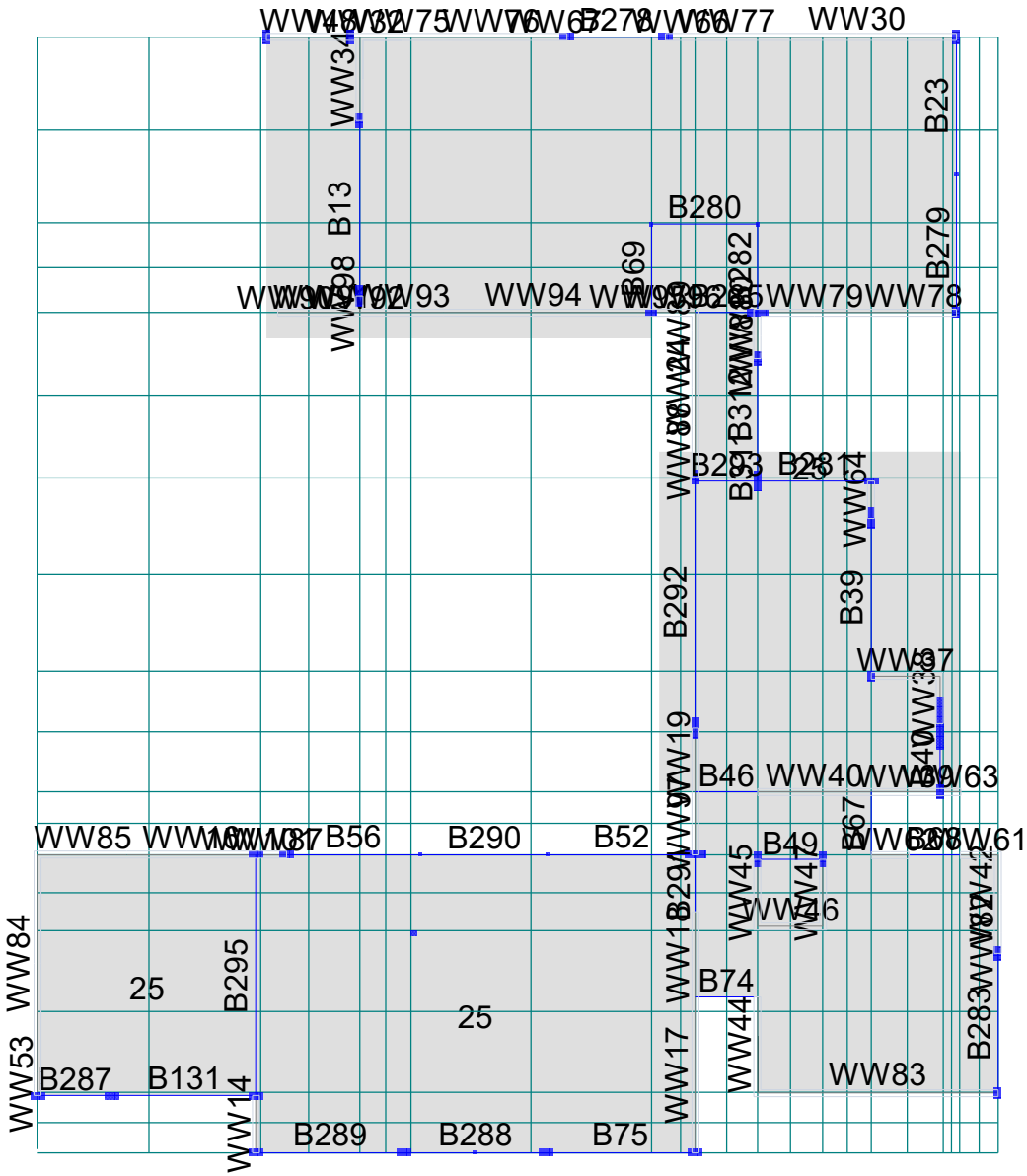
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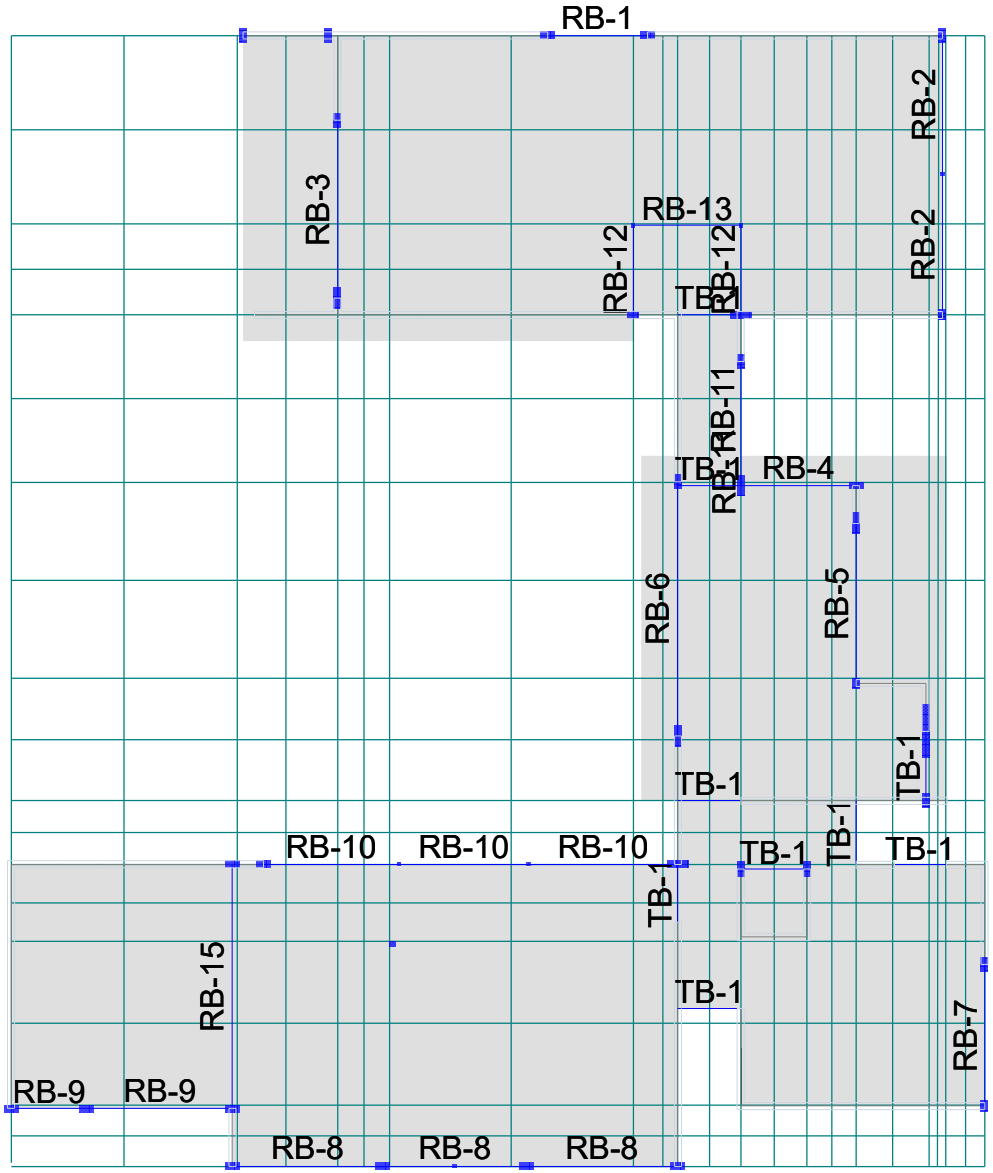
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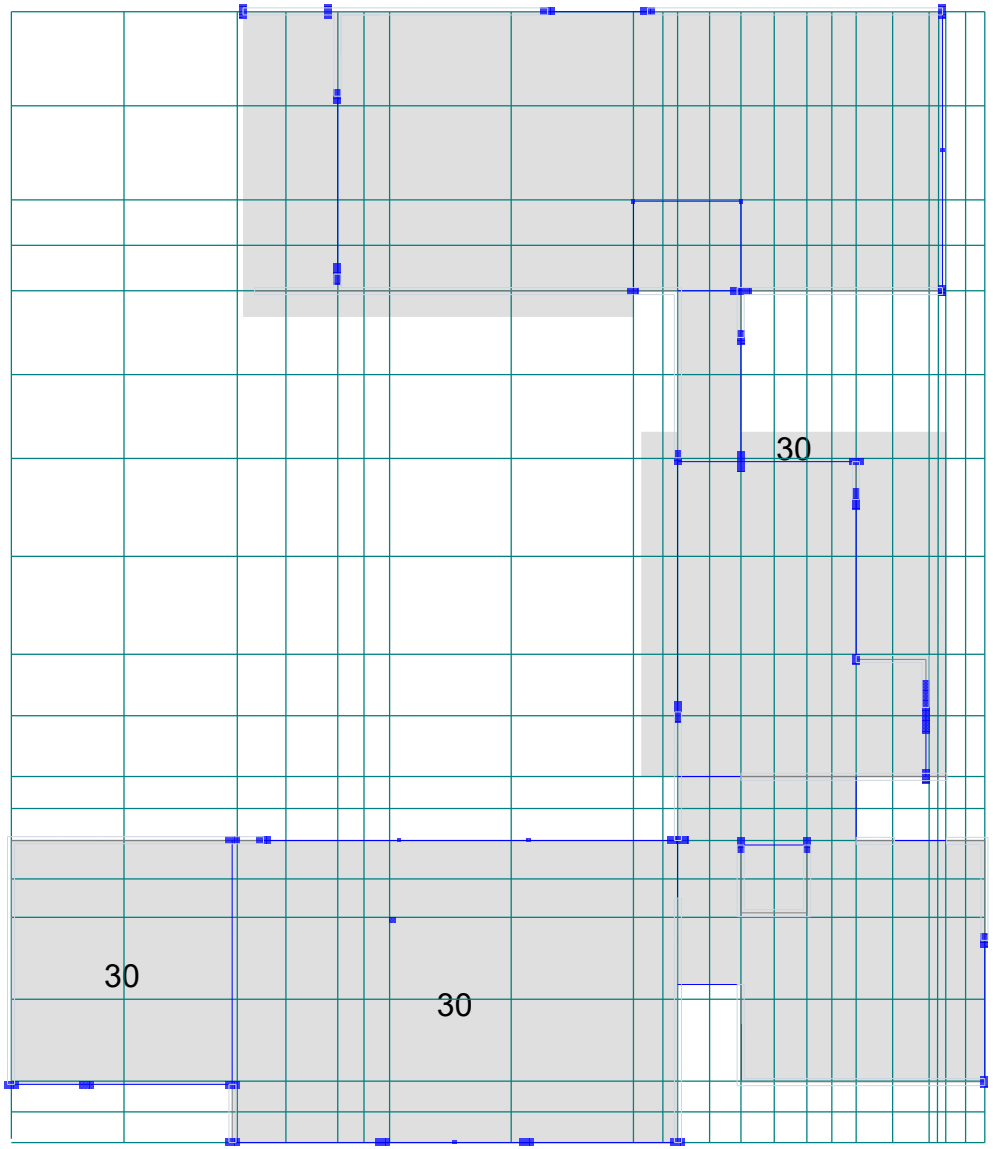
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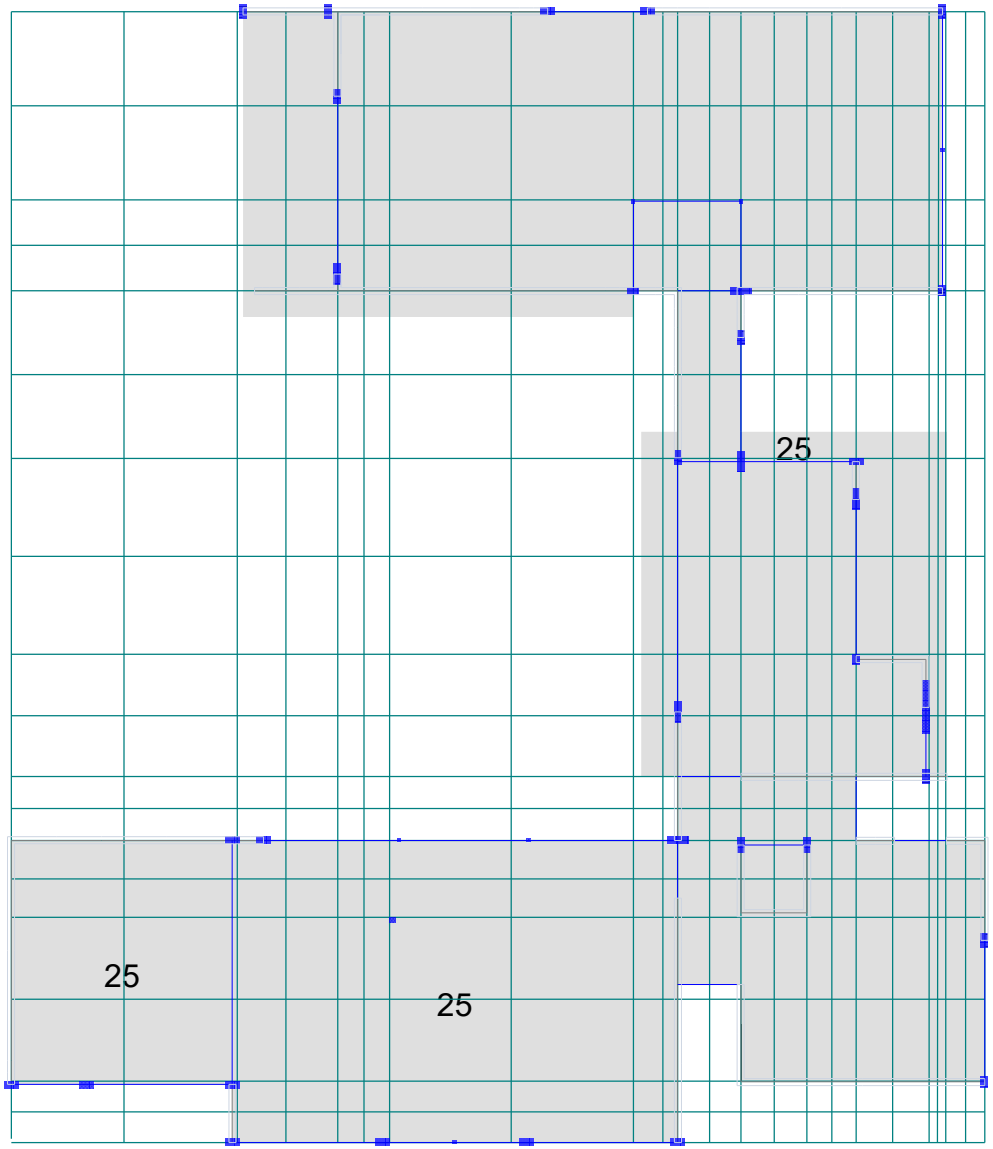
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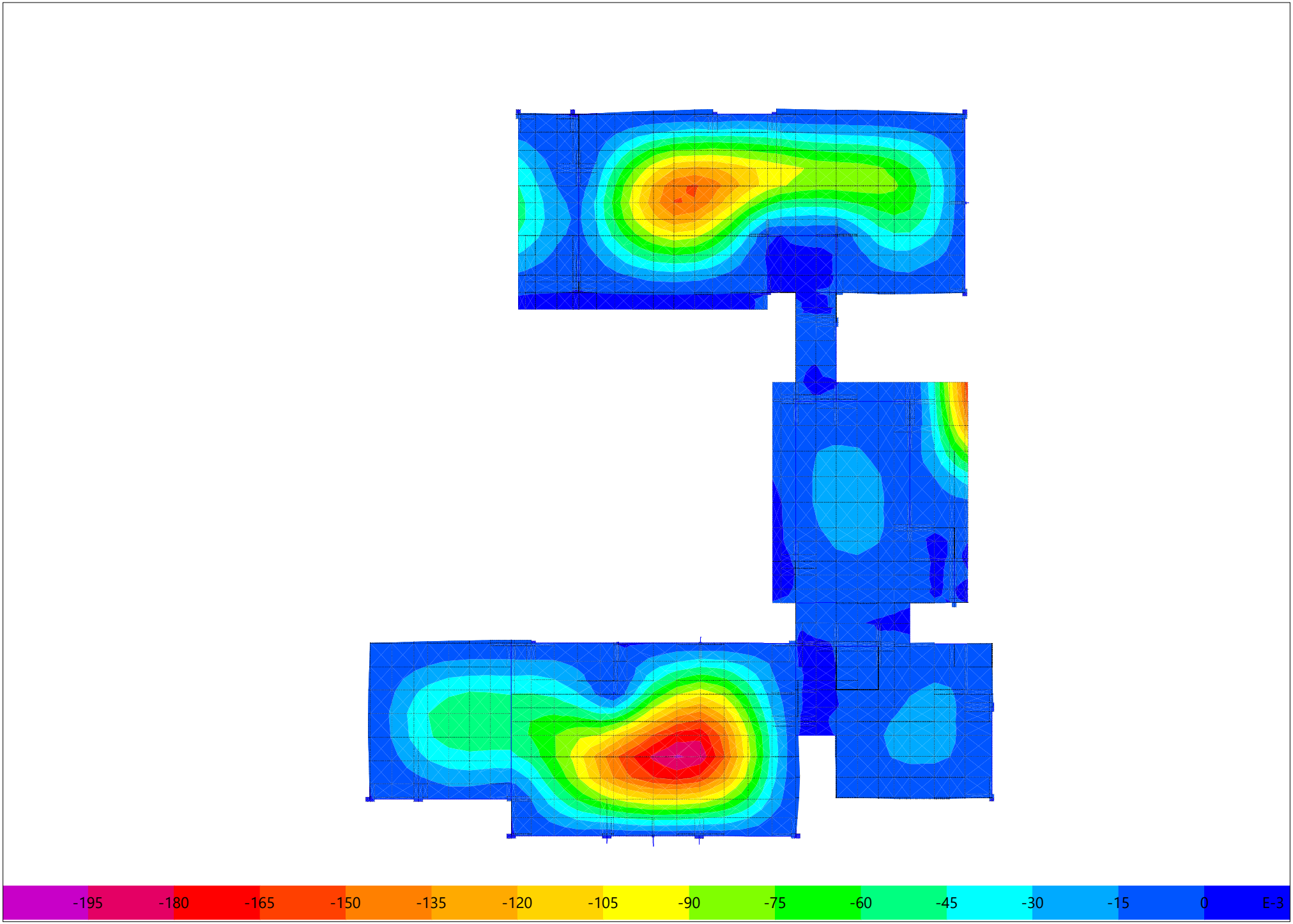

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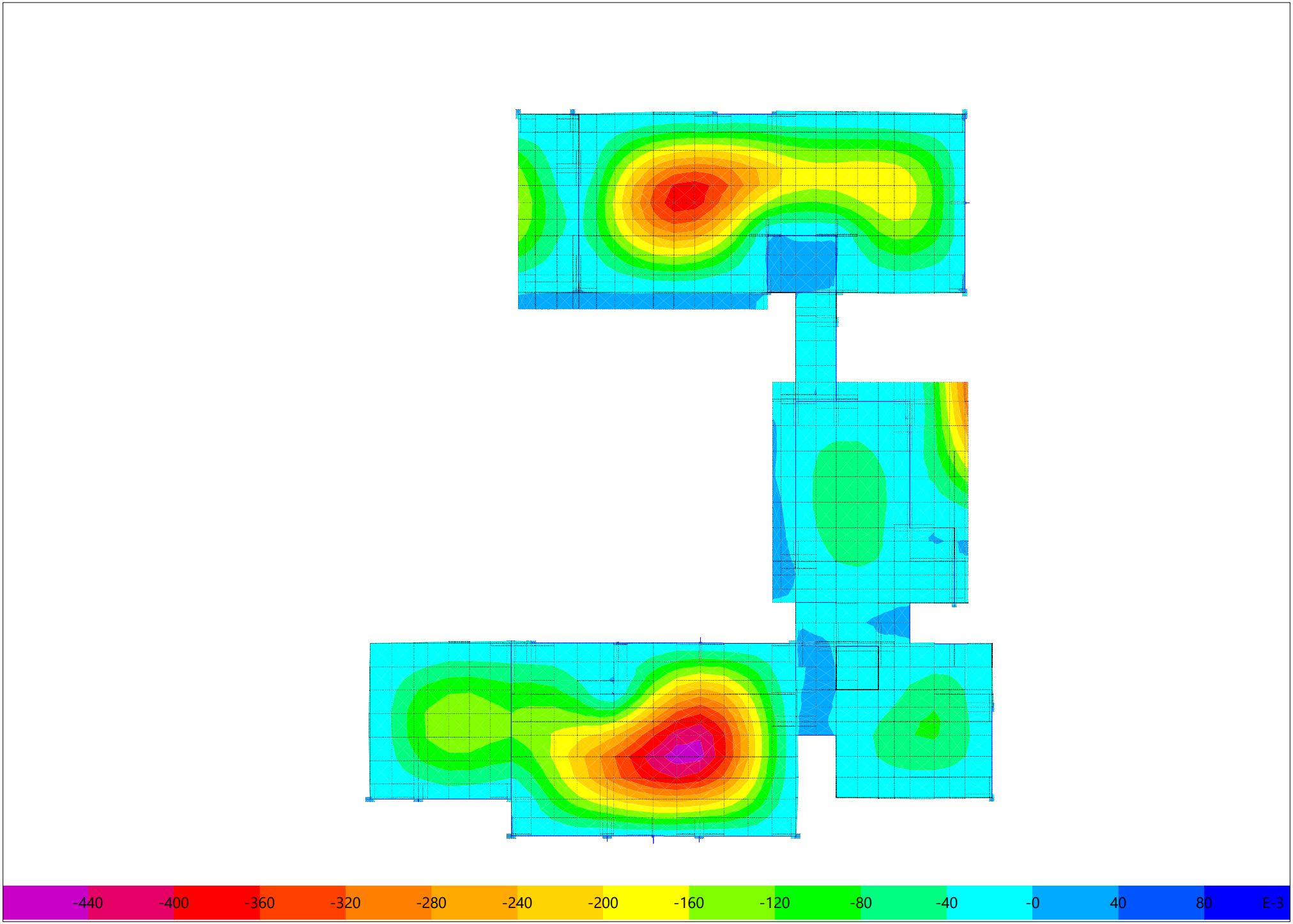

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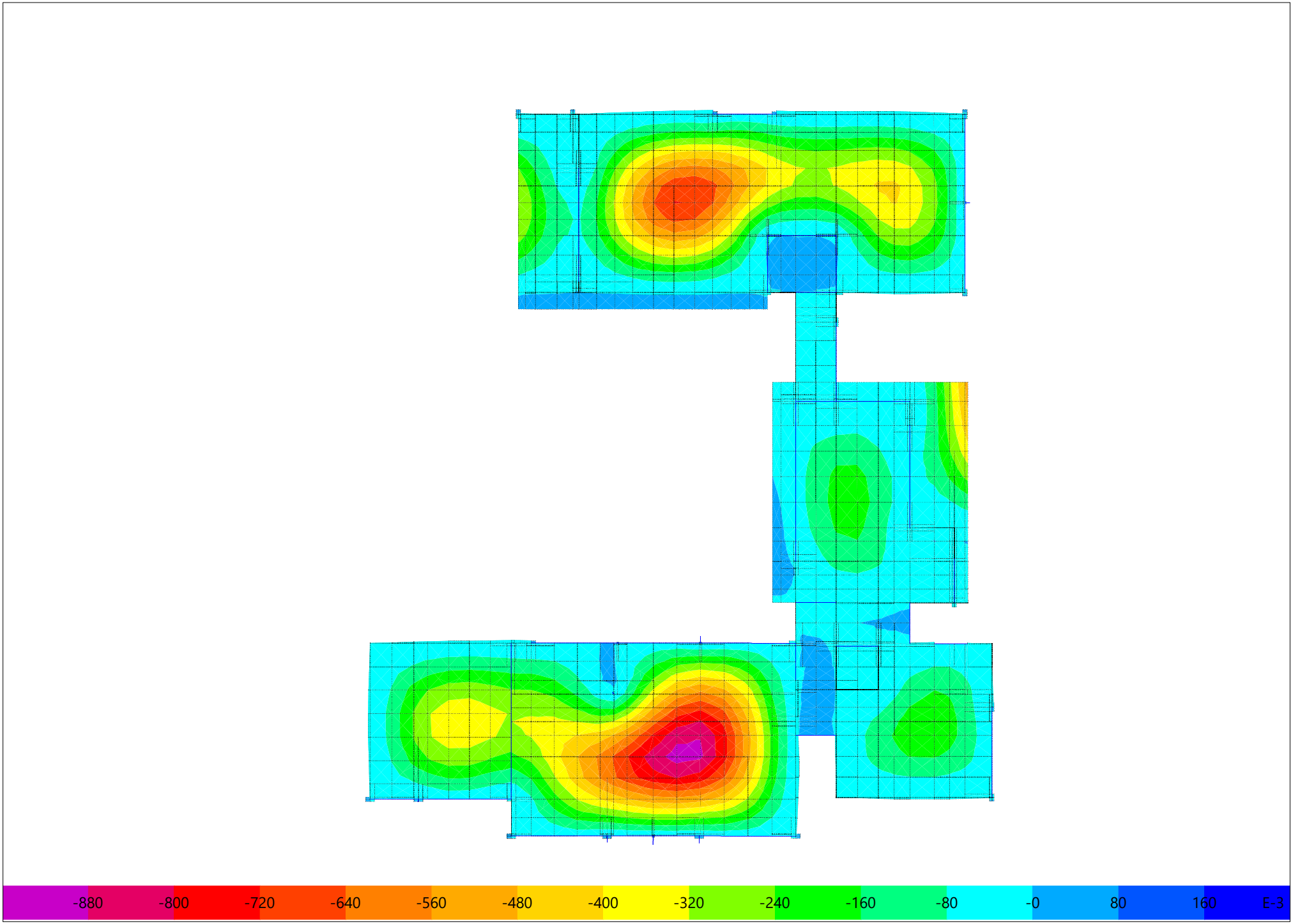

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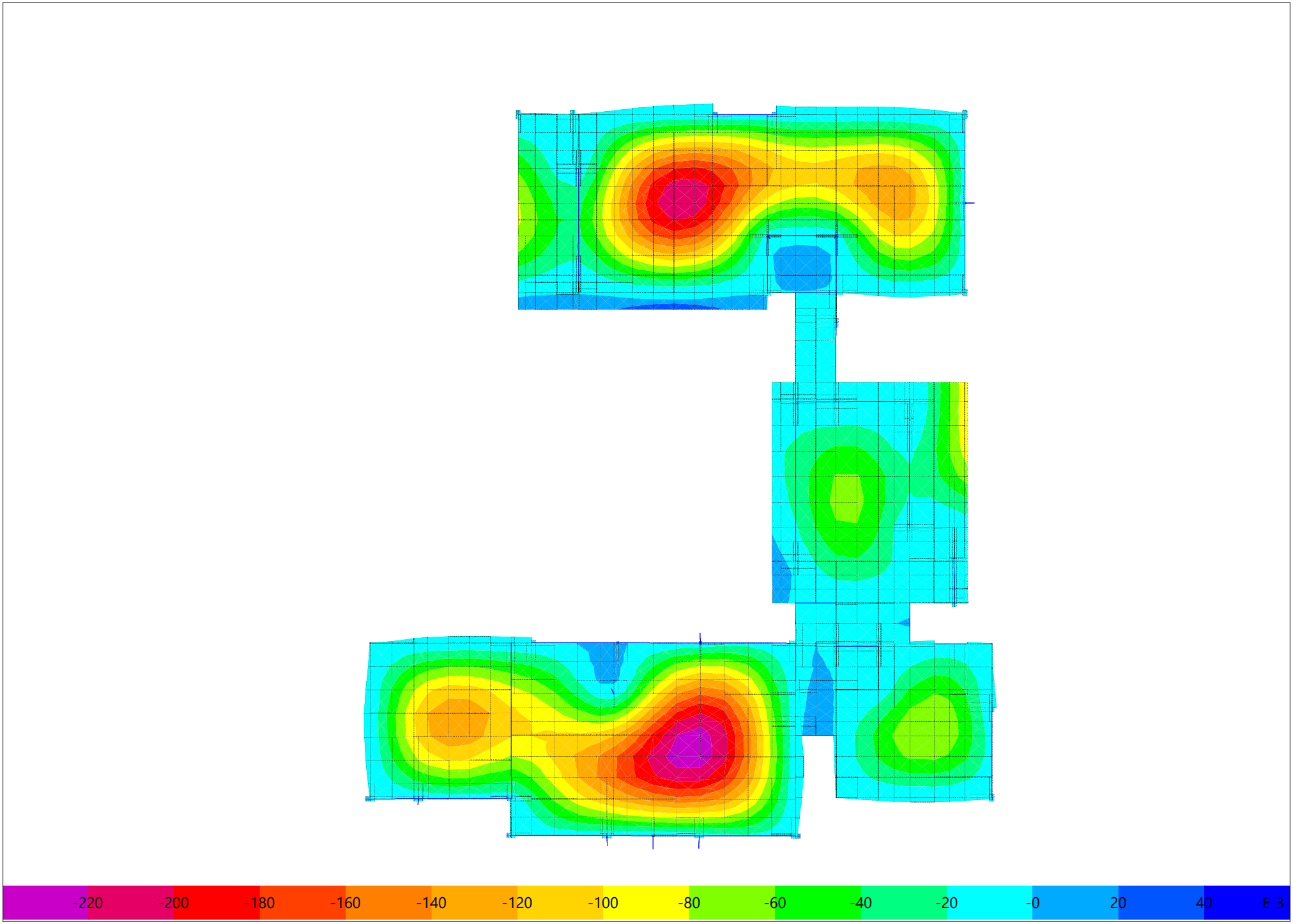

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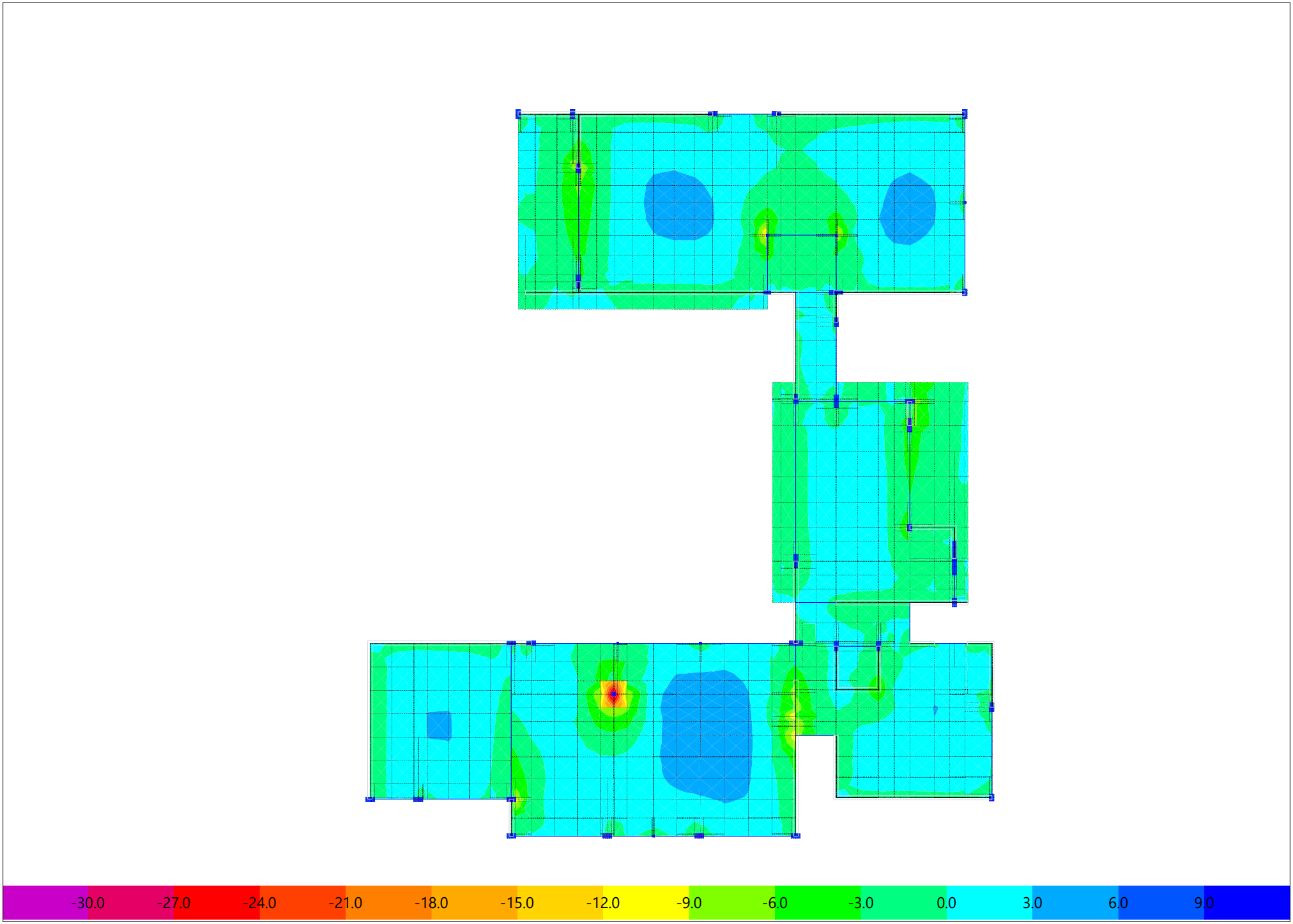

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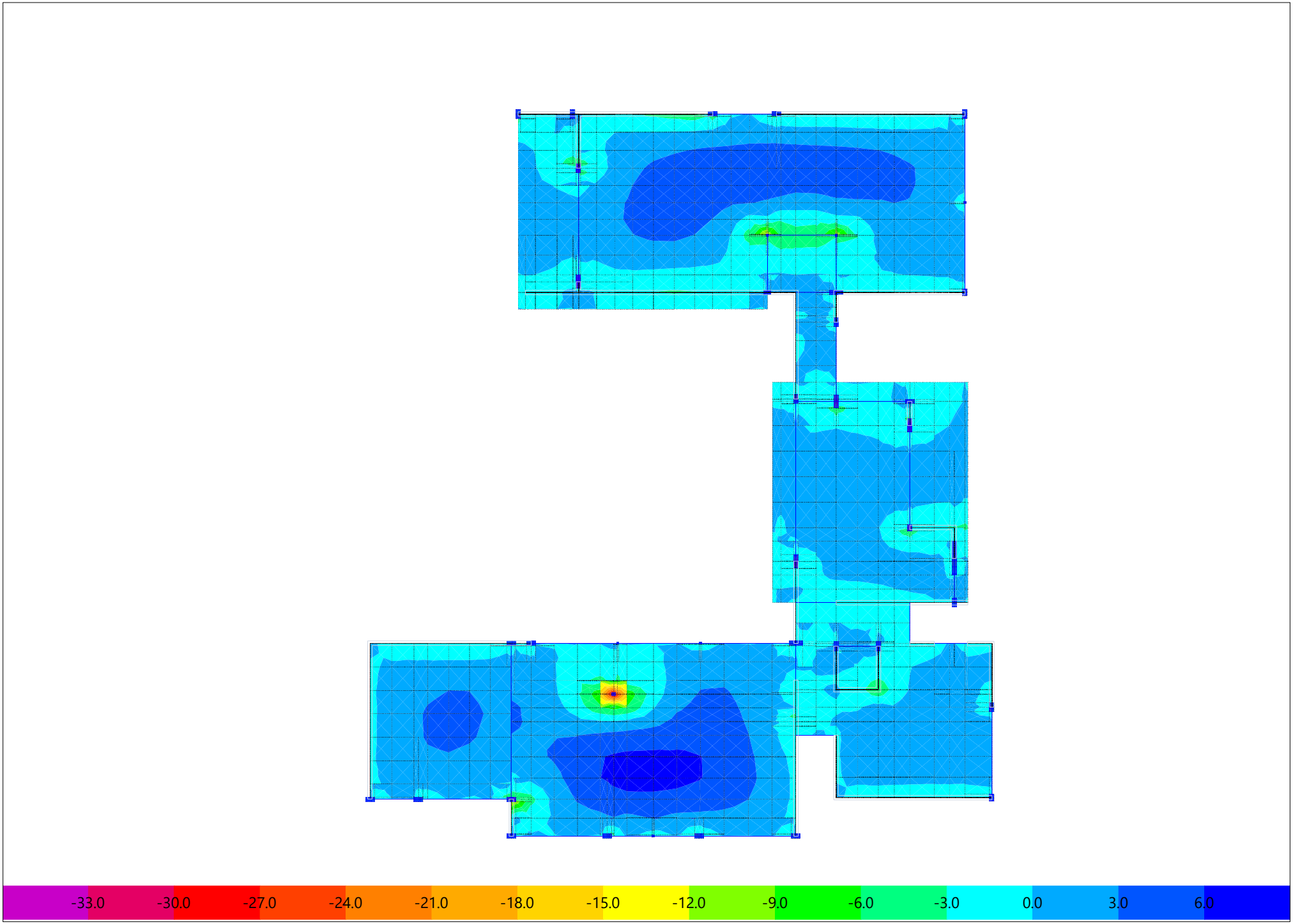

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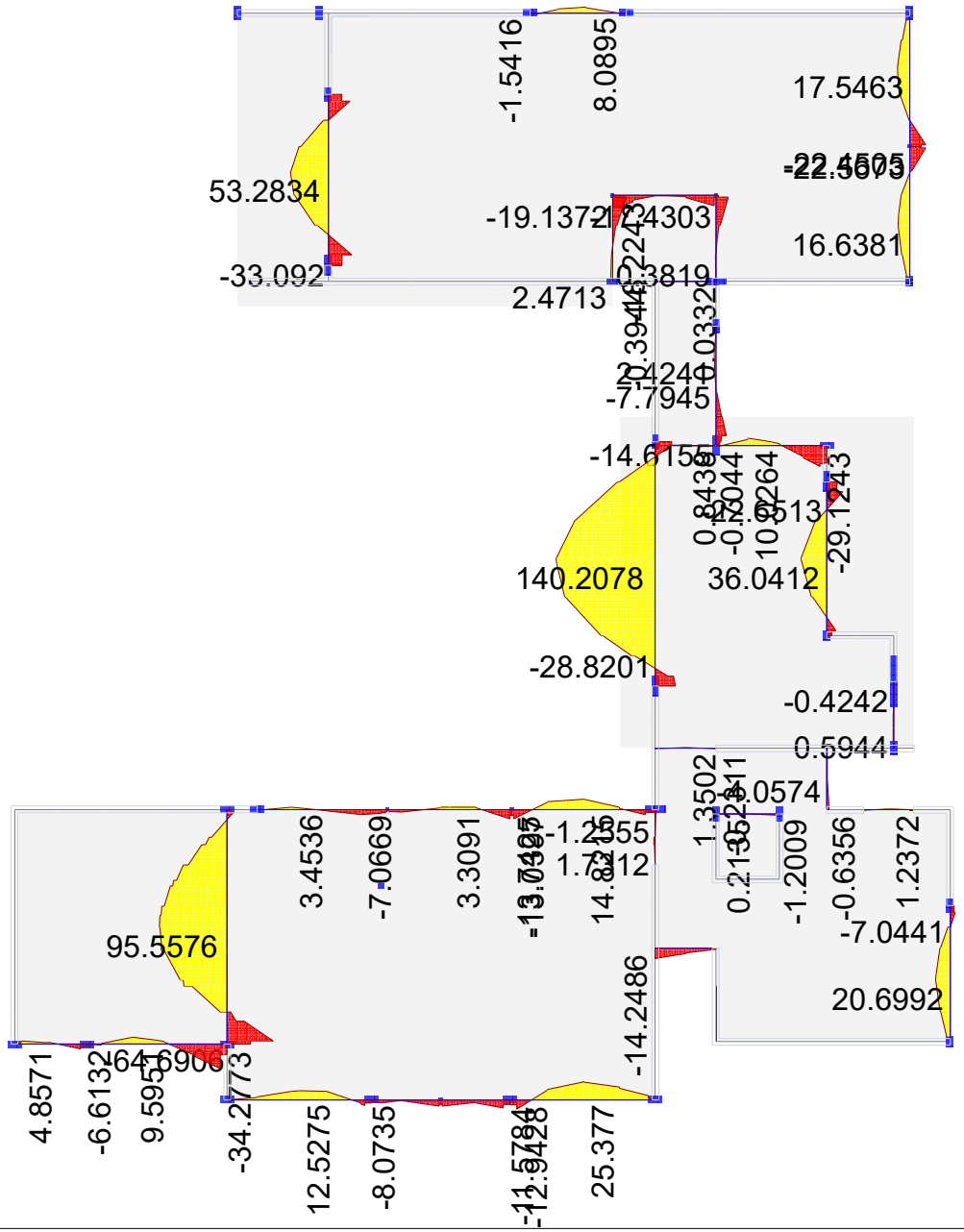
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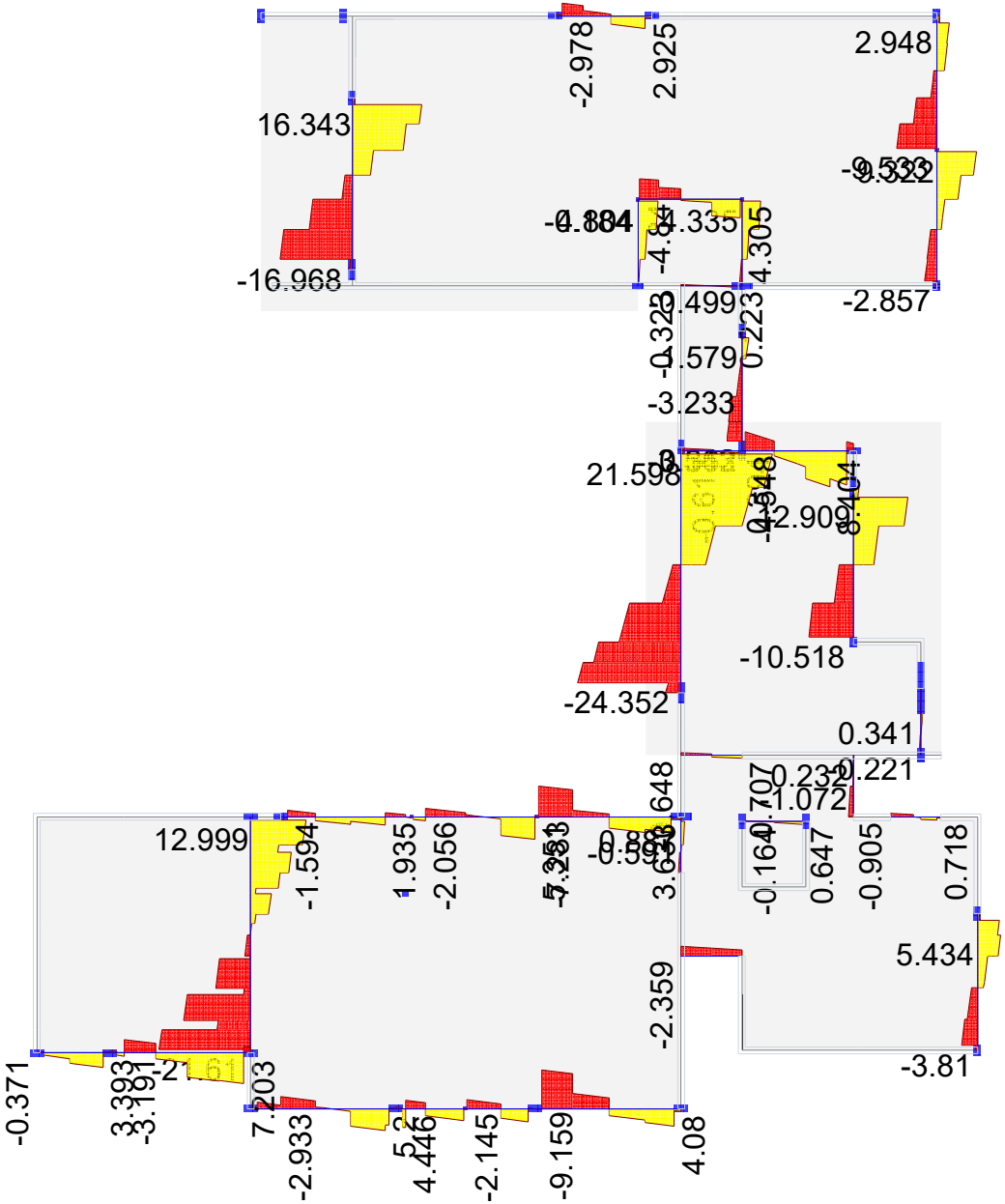
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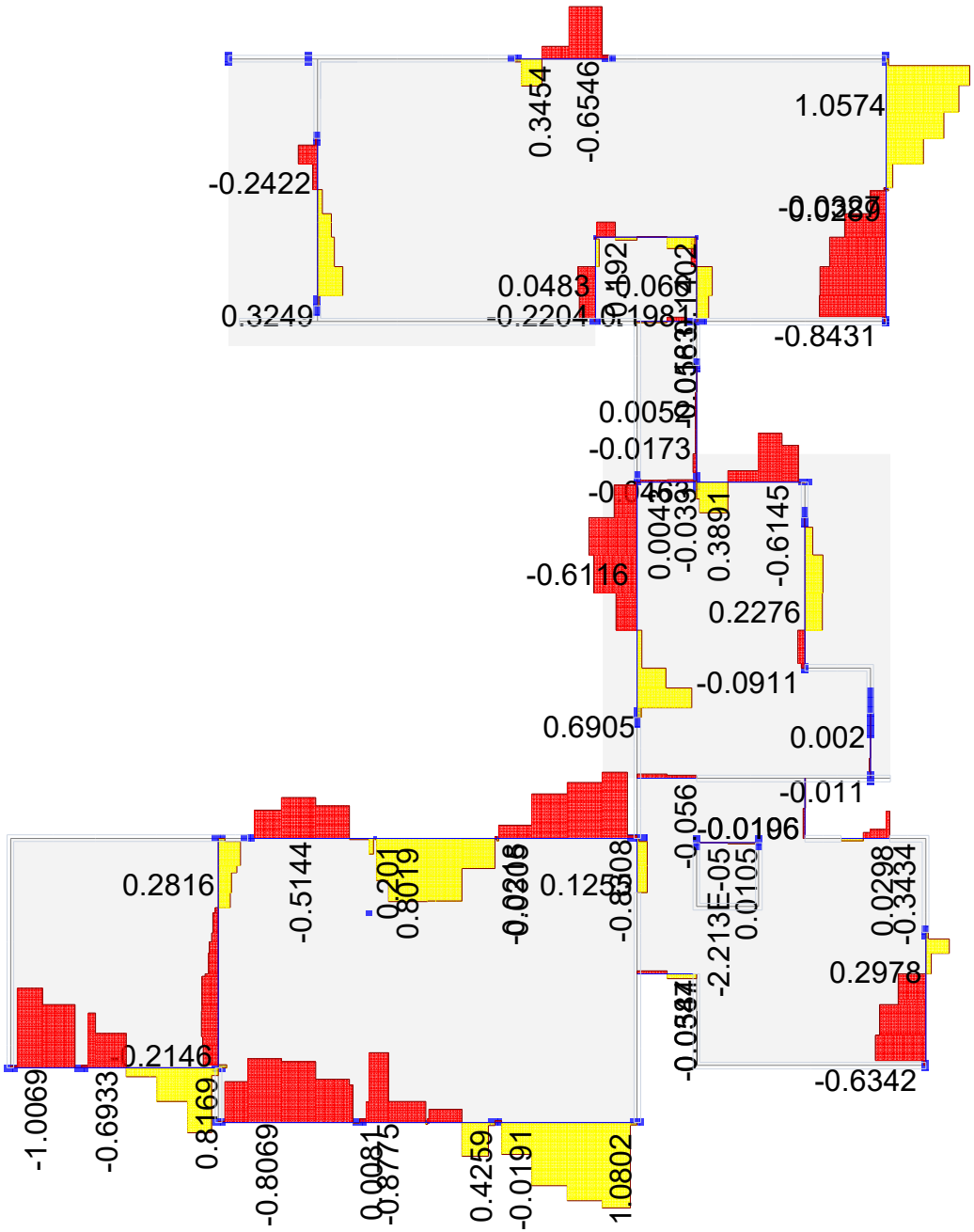
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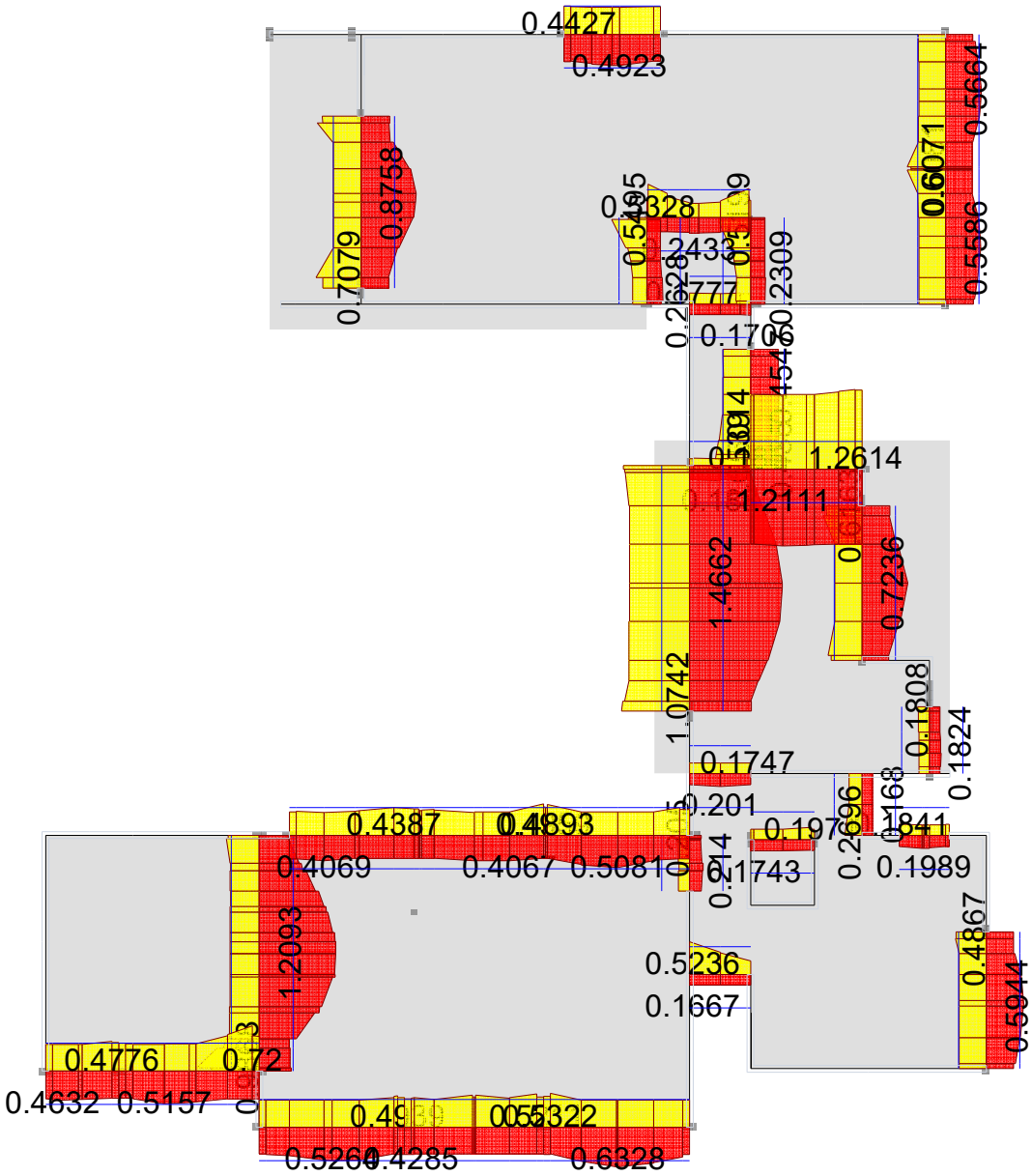
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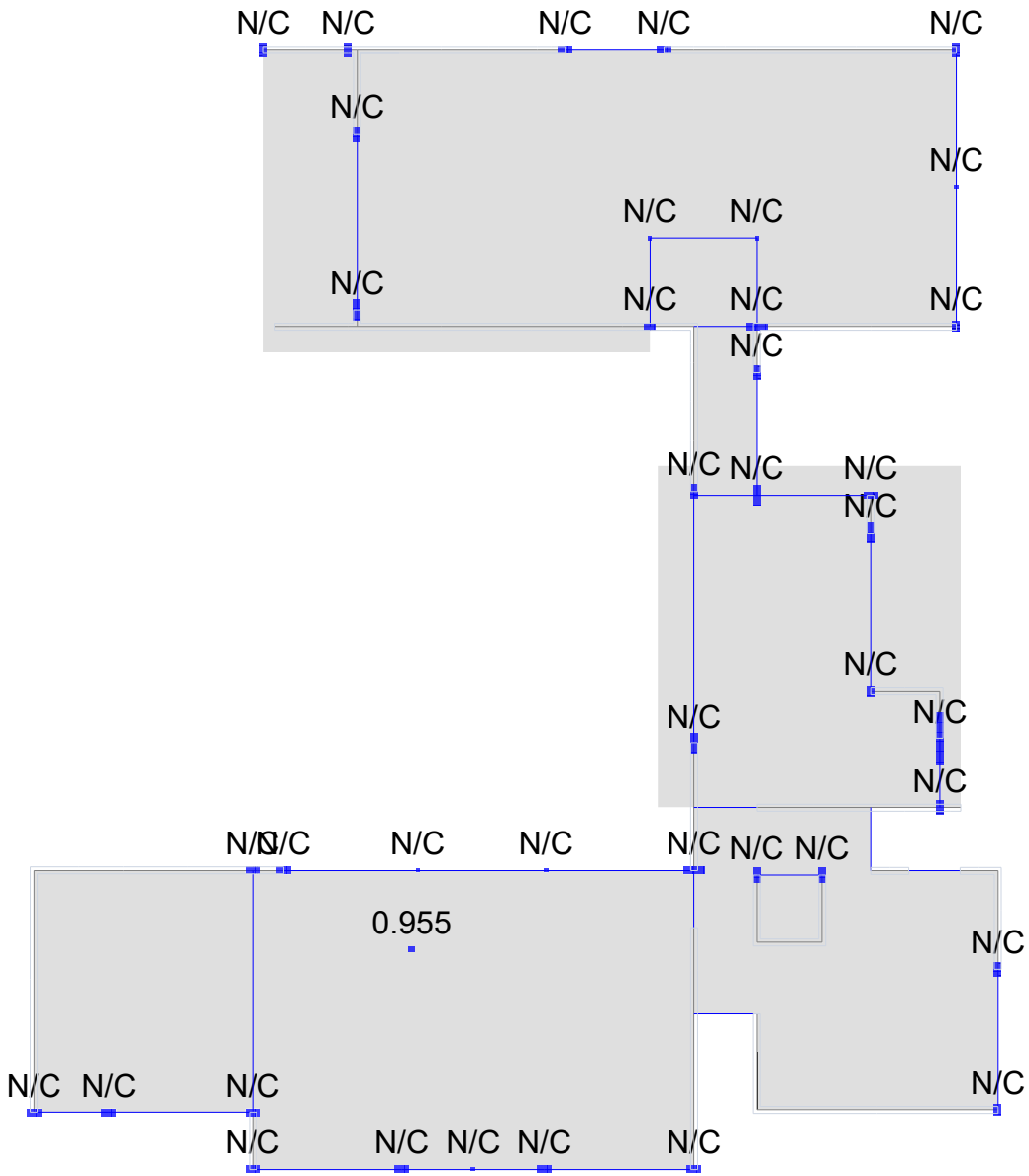
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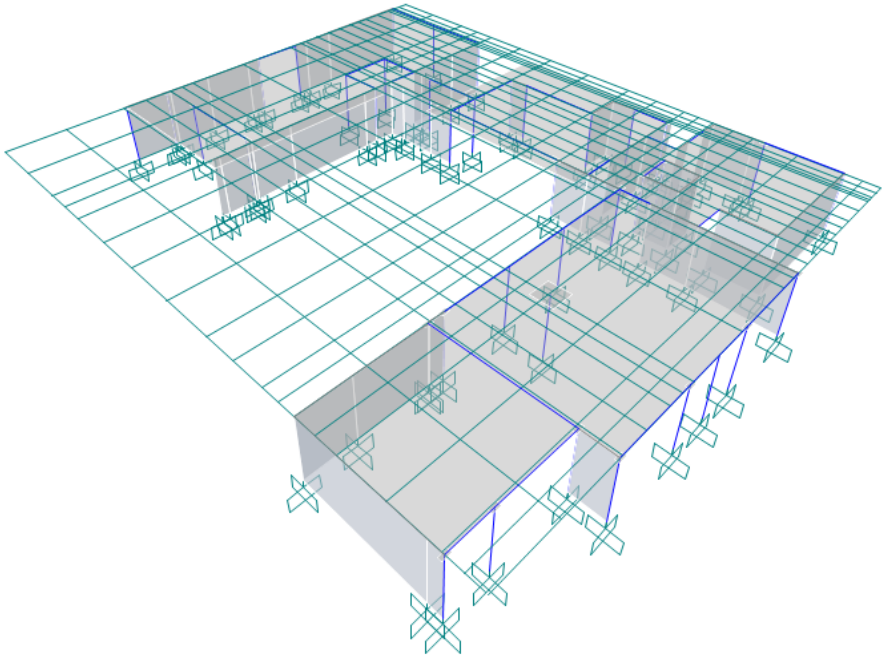

ROOF SLAB DESIGN

10840 SW 67 ave model

Model File: 10840 SW 67 ave ROOF SLAB, Revision 0

4/3/2025

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1 Structure Data

This chapter provides model geometry information, including items such as story levels, point coordinates, and element connectivity.

1.1 Grid Data

Table 1.1 - Grid Definitions - General

Name	Type	Ux ft	Uy ft	Rz deg	Datum Name	Story Name Above	Story Name Below	Model Datum ft	Story Height Above ft	Story Height Below ft	Bubble Size in	Color
GLOBAL	Cartesian	0	0	0	Story1		Base	0		11.5	60	10461087

Table 1.2 - Grid Definitions - Grid Lines

Name	Grid Line Type	ID	Ordinate ft	Bubble Location	Visible
GLOBAL	X (Cartesian)	6	88.9584	End	Yes
GLOBAL	X (Cartesian)	7	110.4257	End	Yes
GLOBAL	X (Cartesian)	2	119.9576	End	Yes
GLOBAL	X (Cartesian)	10	124.9321	End	Yes
GLOBAL	X (Cartesian)	11	148.0508	End	Yes
GLOBAL	X (Cartesian)	3	152.292	End	Yes
GLOBAL	X (Cartesian)	1	158.2872	End	Yes
GLOBAL	X (Cartesian)	12	164.5789	End	Yes
GLOBAL	X (Cartesian)	4	169.2247	End	Yes
GLOBAL	X (Cartesian)	9	176.1934	End	Yes
GLOBAL	X (Cartesian)	8	177.7767	End	Yes
GLOBAL	X (Cartesian)	5	181.4463	End	Yes
GLOBAL	Y (Cartesian)	1	-0.4167	Start	Yes
GLOBAL	Y (Cartesian)	8	5.4063	Start	Yes
GLOBAL	Y (Cartesian)	10	20.9613	Start	Yes
GLOBAL	Y (Cartesian)	4	28.2917	Start	Yes
GLOBAL	Y (Cartesian)	5	34.3229	Start	Yes
GLOBAL	Y (Cartesian)	7	45.9896	Start	Yes
GLOBAL	Y (Cartesian)	6	64.6042	Start	Yes
GLOBAL	Y (Cartesian)	3	80.5052	Start	Yes
GLOBAL	Y (Cartesian)	9	89.1719	Start	Yes
GLOBAL	Y (Cartesian)	2	107.0521	Start	Yes

1.2 Line Connectivity

Table 1.3 - Column Object Connectivity

Unique Name	UniquePtI	UniquePtJ	Length ft
82	260	119	11.5
83	261	120	11.5
84	262	121	11.5
85	263	541	11.5
86	264	542	11.5

Table 1.3 - Column Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
87	265	544	11.5
88	266	543	11.5
89	267	545	11.5
90	268	546	11.5
91	269	122	11.5
92	270	547	11.5
93	271	548	11.5
94	272	123	11.5
95	273	124	11.5
96	274	125	11.5
97	275	126	11.5
98	276	555	11.5
99	277	554	11.5
100	278	556	11.5
101	279	128	11.5
102	280	129	11.5
103	281	558	11.5
104	282	559	11.5
105	283	560	11.5
106	284	557	11.5
107	285	562	11.5
108	286	130	11.5
109	287	131	11.5
110	288	565	11.5
111	289	568	11.5
112	290	566	11.5
113	291	567	11.5
114	292	134	11.5
115	293	570	11.5
116	294	574	11.5
117	295	135	11.5
118	296	136	11.5
119	297	577	11.5
120	298	662	11.5
121	299	665	11.5

Table 1.4 - Beam Object Connectivity

Unique Name	UniquePtI	UniquePtJ	Length ft
B23	543	542	13.2071
B278	121	541	9.5
B279	545	543	13.3398
B281	547	122	10.9375
B39	124	123	15.2188
B40	126	125	6.625

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B67	41	42	6.0833
B68	43	44	4.93
B283	554	555	13.4773
B75	557	556	14.3434
B287	558	559	7.1731
B131	559	129	13.8432
B288	560	557	13.7344
B289	128	560	14.2396
B74	45	46	5.9951
B49	130	131	6.2918
B52	566	567	14.1962
B56	565	568	12.8452
B290	568	566	12.3073
B291	47	567	5.4896
B292	134	570	24.156
B46	48	49	5.9951
B293	50	547	5.9951
B13	577	544	16.8982
B311	547	51	2.8747
B312	51	548	8.9414
B69	574	136	8.5
B280	136	135	10.2364
B282	546	135	8.5
B285	52	546	5.9951
B295	129	665	23.2188

Table 1.5 - Null Line Object Connectivity

Unique Name	UniquePtI	UniquePtJ	Length ft
WW48	120	119	8.1177
WW66	541	53	2.8679
WW67	54	121	2.6479
WW30	55	542	19.1562
WW32	119	56	0.8475
WW34	544	56	8.0412
WW75	56	57	8.0379
WW76	57	54	9.2808
WW77	53	55	5.9951
WW78	58	545	8.2187
WW79	546	58	10.9375
WW80	59	546	2.2486
WW81	548	59	2.1697
WW37	124	60	6.6354
WW38	125	60	4.5417
WW39	42	126	6.6354

Table 1.5 - Null Line Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
WW40	49	42	10.9375
WW63	126	61	2
WW64	123	122	3.5625
WW42	62	63	7.5208
WW61	44	63	3.6458
WW62	41	43	3.6458
WW82	555	62	1.9271
WW83	64	554	23.1592
WW44	64	46	9.2481
WW17	556	45	14.9792
WW18	45	47	8.2396
WW14	128	129	5.4896
WW53	558	65	2.2519
WW84	65	66	20.9668
WW45	67	130	6.4354
WW46	67	68	6.2918
WW47	68	131	6.4354
WW85	66	69	8.6048
WW87	70	565	2.5176
WW19	48	134	6.1667
WW24	71	72	7.4372
WW88	570	71	4.9869
WW89	72	52	3.4356
WW90	74	73	1.4577
WW91	73	75	5.5736
WW92	75	76	0.8475
WW94	78	77	17.4226
WW95	77	574	2.6327
WW96	574	52	4.2413
WW93	76	78	8.0379
WW97	567	48	6.0313
WW98	76	577	1.6075
WW16	69	665	12.4115
WW101	665	70	0.451

1.3 Area Connectivity

Table 1.6 - Floor Object Connectivity

Unique Name	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2	Order
ColC119	85	86	87	88	4	0.89	
ColC120	89	90	91	92	4	0.89	
ColC121	93	94	95	96	4	0.89	
ColC541	97	98	99	100	4	0.89	
ColC542	101	102	103	104	4	0.89	
ColC544	105	106	107	108	4	0.89	

Table 1.6 - Floor Object Connectivity (continued)

Unique Name	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2	Order
ColC543	109	110	111	112	1.3333	0.11	
ColC545	113	114	115	116	3.3333	0.67	
ColC546	117	118	127	132	5.3333	1.33	
ColC122	133	137	138	139	4	0.89	
ColC547	140	141	142	143	5.3333	1.33	
ColC548	144	145	146	147	4	0.89	
ColC123	148	149	150	151	5.3333	1.33	
ColC124	152	153	154	155	3.3333	0.67	
ColC125	156	157	158	159	11.3333	3.33	
ColC126	160	161	162	163	4	0.89	
ColC555	164	165	166	167	4	0.89	
ColC554	168	169	170	171	3.3333	0.67	
ColC556	172	173	174	175	4	0.89	
ColC128	176	177	178	179	4	0.89	
ColC129	180	181	182	183	4	0.89	
ColC558	184	185	186	187	4	0.89	
ColC559	188	189	190	191	4	0.89	
ColC560	192	193	194	195	4	0.89	
ColC557	196	197	198	199	4	0.89	
ColC562	200	201	202	203	1.3333	0.11	
ColC130	204	205	206	207	4	0.89	
ColC131	208	209	210	211	4	0.89	
ColC565	212	213	214	215	4	0.89	
ColC568	216	217	218	219	1.3333	0.11	
ColC566	220	221	222	223	1.3333	0.11	
ColC567	224	225	226	227	5.3333	1.33	
ColC134	228	229	230	231	5.3333	1.33	
ColC570	232	233	234	235	4	0.89	
ColC574	236	237	238	239	3.3333	0.67	
ColC135	240	241	242	243	1.3333	0.11	
ColC136	244	245	246	247	1.3333	0.11	
ColC577	248	249	250	251	5.3333	1.33	
ColC665	256	257	258	259	4	0.89	
2	665	66	558	129	88.47	487.97	
4	567	47	45	556	142.0514	1214.86	1
4	128	129	665				2
F3	51	546	545	542	411.9666	3606.83	1
F3	120	84	83	574			2
F3	52	82	81	80			3
F3	48	567	47	372			4
F3	373	376	375	45			5
F3	46	64	554	63			6
F3	41	42	61	79			7
1	252	253	254	255	16	16	

Table 1.7 - Wall Object Connectivity

UniqueName	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2
42	261	260	119	120	39.2355	93.35
43	263	300	53	541	28.7357	32.98
44	301	262	121	54	28.2957	30.45
45	302	264	542	55	61.3125	220.3
46	260	303	56	119	24.6951	9.75
47	265	303	56	544	39.0824	92.47
48	303	304	57	56	39.0758	92.44
49	304	301	54	57	41.5615	106.73
50	300	302	55	53	34.9903	68.94
51	305	267	545	58	39.4375	94.52
52	268	305	58	546	44.875	125.78
53	306	268	546	59	27.4971	25.86
54	271	306	59	548	27.3394	24.95
55	273	307	60	124	36.2708	76.31
56	274	307	60	125	32.0833	52.23
57	308	275	126	42	36.2708	76.31
58	309	308	42	49	44.875	125.78
59	275	310	61	126	27	23
60	272	269	122	123	30.125	40.97
61	311	312	63	62	38.0417	86.49
62	313	312	63	44	30.2917	41.93
63	314	315	43	41	30.2917	41.93
64	276	311	62	555	26.8542	22.16
65	316	277	554	64	69.3183	266.33
66	316	317	46	64	41.4963	106.35
67	278	318	45	556	52.9583	172.26
68	318	319	47	45	39.4792	94.76
69	279	280	129	128	33.9792	63.13
70	281	320	65	558	27.5038	25.9
71	320	321	66	65	64.9337	241.12
72	322	286	130	67	35.8708	74.01
73	322	323	68	67	35.5835	72.36
74	323	287	131	68	35.8708	74.01
75	321	324	69	66	40.2095	98.95
76	325	288	565	70	28.0353	28.95
77	326	292	134	48	35.3333	70.92
78	327	328	72	71	37.8743	85.53
79	293	327	71	570	32.9738	57.35
80	328	329	52	72	29.8712	39.51
81	330	331	73	74	25.9154	16.76
82	331	332	75	73	34.1472	64.1
83	332	333	76	75	24.6951	9.75
84	334	335	77	78	57.8452	200.36
85	335	294	574	77	28.2653	30.28
86	294	329	52	574	31.4826	48.77

Table 1.7 - Wall Object Connectivity (continued)

UniqueName	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2
87	333	334	78	76	39.0758	92.44
88	291	326	48	567	35.0625	69.36
89	333	297	577	76	26.2149	18.49
90	324	299	665	69	47.823	142.73
91	299	325	70	665	23.902	5.19

1.4 Strip Connectivity

Table 1.8 - Strip Object Connectivity

Name	Number Segments	Strip Start Point	Segment End Point	Start Width Left ft	Start Width Right ft	End Width Left ft	End Width Right ft	Auto Widen	Layer
CSA1	1	1	2	5.3668	0	5.3668	0	Yes	A
CSA10	1	15	16	0.9174	0.3333	0.9174	0.3958	Yes	A
CSA11	1	17	18	0.9174	0	0.9174	0	Yes	A
CSA12	1	19	20	1.1614	1.5729	1.1614	1.5729	Yes	A
CSA2	1	3	4	2.3128	5.3668	2.3128	5.3668	Yes	A
CSA3	1	56	5	1.2436	2.4532	1.2436	2.4532	Yes	A
CSA4	1	6	7	5.7797	1.2436	5.7797	1.2436	Yes	A
CSA5	1	8	9	1.4037	5.7797	1.4037	5.7797	Yes	A
CSA6	1	53	556	1.4988	0.717	1.4988	0.717	Yes	A
CSA7	1	55	10	1.5729	1.4988	1.5729	1.4988	Yes	A
CSA8	1	11	12	1.7422	1.1614	1.7422	1.1614	Yes	A
CSA9	1	13	14	1.7422	0.3958	1.7422	0.4583	Yes	A
CSB1	1	1	18	0	4.4701	0	4.4701	Yes	B
CSB10	1	353	17	1.4557	0	1.4557	0	Yes	B
CSB2	1	338	339	4.4701	2.1667	4.4701	2.1667	Yes	B
CSB3	1	340	341	2.1667	3.9753	2.1667	3.9753	Yes	B
CSB4	1	342	343	3.9753	4.6536	3.9753	4.6536	Yes	B
CSB5	1	344	345	4.6536	2.9167	4.6536	2.9167	Yes	B
CSB6	1	346	347	2.9167	1.5078	2.9167	1.5078	Yes	B
CSB7	1	66	348	1.5078	1.8326	1.5078	1.8326	Yes	B
CSB8	1	349	350	1.8326	3.8888	1.8326	3.8888	Yes	B
CSB9	1	351	352	3.8888	1.4557	3.8888	1.4557	Yes	B
MSA1	1	21	22	0.9174	0.9174	0.9174	0.9174	Yes	A
MSA10	1	39	40	2.4532	2.3128	2.4532	2.3128	Yes	A
MSA11	1	336	337	5.3668	5.3668	5.3668	5.3668	Yes	A
MSA2	1	23	24	0.3333	0.4583	0.3958	0.3958	Yes	A
MSA3	1	25	26	1.7422	1.7422	1.7422	1.7422	Yes	A
MSA4	1	27	28	1.1614	1.1614	1.1614	1.1614	Yes	A
MSA5	1	29	30	1.5729	1.5729	1.5729	1.5729	Yes	A
MSA6	1	31	32	1.4988	1.4988	1.4988	1.4988	Yes	A
MSA7	1	33	34	0.717	1.4037	0.717	1.4037	Yes	A
MSA8	1	35	36	5.7797	5.7797	5.7797	5.7797	Yes	A
MSA9	1	37	38	1.2436	1.2436	1.2436	1.2436	Yes	A

Table 1.8 - Strip Object Connectivity (continued)

Name	Number Segments	Strip Start Point	Segment End Point	Start Width Left ft	Start Width Right ft	End Width Left ft	End Width Right ft	Auto Widen	Layer
MSB1	1	354	355	1.4557	1.4557	1.4557	1.4557	Yes	B
MSB2	1	356	357	3.8888	3.8888	3.8888	3.8888	Yes	B
MSB3	1	358	359	1.8326	1.8326	1.8326	1.8326	Yes	B
MSB4	1	360	361	1.5078	1.5078	1.5078	1.5078	Yes	B
MSB5	1	362	363	2.9167	2.9167	2.9167	2.9167	Yes	B
MSB6	1	364	365	4.6536	4.6536	4.6536	4.6536	Yes	B
MSB7	1	366	367	3.9753	3.9753	3.9753	3.9753	Yes	B
MSB8	1	368	369	2.1667	2.1667	2.1667	2.1667	Yes	B
MSB9	1	370	371	4.4701	4.4701	4.4701	4.4701	Yes	B

1.5 Mass

Table 1.9 - Mass Source Definition

Name	Is Default	Include Lateral Mass?	Include Vertical Mass?	Lump Mass?	Source Self Mass?	Source Added Mass?	Source Load Patterns?	Move Mass Centroid?
MsSrc1	Yes	No	Yes	Yes	Yes	Yes	No	No

Table 1.10 - Mass Summary by Group

Group	Self Mass lb-s2/ft	Self Weight kip	Mass X lb-s2/ft	Mass Y lb-s2/ft	Mass Z lb-s2/ft
All	33423.57	0	33423.57	33423.57	33423.57

2 Properties

This chapter provides property information for materials, frame sections, shell sections, and links.

2.1 Materials

Table 2.1 - Material Properties - General

Material	Type	SymType	Grade	Color	Notes
A416Gr270	Tendon	Uniaxial	Unknown	Magenta	ASTM A416 Grade 270 added 4/3/2025 4:47:13 PM
A500GrB46	Steel	Isotropic	Grade B, Fy 46 (HSS Rect.)	Magenta	
A615Gr60	Rebar	Uniaxial	Unknown	Cyan	ASTM A615 Grade 60 added 4/3/2025 4:47:13 PM
MAT1	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 4:47:13 PM
MAT2	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 4:47:13 PM
MAT3	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 4:47:13 PM
MAT4	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 4:47:13 PM
MAT5	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 4:47:13 PM

2.2 Frame Sections

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 3)

Name	Material	Shape	Color	Area in2	J in4	I33 in4	I22 in4	I23 in4	As2 in2
C119	MAT3	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67
C120	MAT3	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67
C121	MAT3	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67
C122	MAT3	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67
C123	MAT3	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160
C124	MAT3	Concrete Rectangular	Red	96	1205.11	1152	512	0	80
C125	MAT3	Concrete Rectangular	Magenta	480	9391.99	144000	2560	0	400
C126	MAT3	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67
C128	MAT3	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67
C129	MAT3	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67
C130	MAT3	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67
C131	MAT3	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67
C134	MAT3	Concrete Rectangular	Magenta	192	3240.89	9216	1024	0	160
C135	MAT4	Concrete Rectangular	Red	16	36.07	21.33	21.33	0	13.33
C136	MAT4	Concrete Rectangular	Magenta	16	36.07	21.33	21.33	0	13.33
C541	MAT3	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67
C542	MAT3	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67
C543	MAT4	Concrete Rectangular	Blue	16	36.07	21.33	21.33	0	13.33
C544	MAT3	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67
C545	MAT3	Concrete Rectangular	Green	96	1205.11	1152	512	0	80
C546	MAT3	Concrete Rectangular	Cyan	192	3240.89	9216	1024	0	160
C547	MAT3	Concrete Rectangular	Magenta	192	3240.89	9216	1024	0	160
C548	MAT3	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67
C554	MAT3	Concrete Rectangular	Blue	96	1205.11	1152	512	0	80
C555	MAT3	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67
C556	MAT3	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67
C557	MAT3	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 3, continued)

Name	Material	Shape	Color	Area in2	J in4	I33 in4	I22 in4	I23 in4	As2 in2
C558	MAT3	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67
C559	MAT3	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67
C560	MAT3	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67
C562	MAT4	Concrete Rectangular	Magenta	16	36.07	21.33	21.33	0	13.33
C565	MAT3	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67
C566	MAT4	Concrete Rectangular	Cyan	16	36.07	21.33	21.33	0	13.33
C567	MAT3	Concrete Rectangular	Red	192	3240.89	9216	1024	0	160
C568	MAT4	Concrete Rectangular	Green	16	36.07	21.33	21.33	0	13.33
C570	MAT3	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67
C574	MAT3	Concrete Rectangular	Cyan	96	1205.11	1152	512	0	80
C577	MAT3	Concrete Rectangular	Yellow	192	3240.89	9216	1024	0	160
C665	MAT3	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67
RB-1	MAT1	Concrete Rectangular	Blue	240	4265.95	18000	1280	0	200
RB-10	MAT1	Concrete Rectangular	Yellow	208	3582.29	11717.33	1109.33	0	173.33
RB-11	MAT1	Concrete Rectangular	Gray8Dark	240	4265.95	18000	1280	0	200
RB-12	MAT1	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67
RB-13	MAT1	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67
RB-15	MAT1	Concrete Rectangular	Cyan	256	4608.18	21845.33	1365.33	0	213.33
RB-2	MAT1	Concrete Rectangular	Green	240	4265.95	18000	1280	0	200
RB-3	MAT1	Concrete Rectangular	Cyan	240	4265.95	18000	1280	0	200
RB-4	MAT1	Concrete Rectangular	Red	640	12809.12	341333.33	3413.33	0	533.33
RB-5	MAT1	Concrete Rectangular	Magenta	240	4265.95	18000	1280	0	200
RB-6	MAT1	Concrete Rectangular	Yellow	512	10075.05	174762.67	2730.67	0	426.67
RB-7	MAT1	Concrete Rectangular	Gray8Dark	240	4265.95	18000	1280	0	200
RB-8	MAT1	Concrete Rectangular	Red	240	4265.95	18000	1280	0	200
RB-9	MAT1	Concrete Rectangular	Magenta	240	4265.95	18000	1280	0	200
STEEL COLUMN	A500GrB46	Concrete Rectangular	Blue	36	182.59	108	108	0	30
TB-1	MAT1	Concrete Rectangular	Gray8Dark	96	1205.11	1152	512	0	80

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 3)

Name	As3 in2	S33Pos in3	S33Neg in3	S22Pos in3	S22Neg in3	Z33 in3	Z22 in3	R33 in	R22 in	CG Offset 3 in	CG Offset 2 in
C119	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C120	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C121	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C122	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C123	160	768	768	256	256	1152	384	6.9282	2.3094	0	0
C124	80	192	192	128	128	288	192	3.4641	2.3094	0	0
C125	400	4800	4800	640	640	7200	960	17.3205	2.3094	0	0
C126	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C128	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C129	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C130	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C131	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 3, continued)

Name	As3 in2	S33Pos in3	S33Neg in3	S22Pos in3	S22Neg in3	Z33 in3	Z22 in3	R33 in	R22 in	CG Offset 3 in	CG Offset 2 in
C134	160	768	768	256	256	1152	384	6.9282	2.3094	0	0
C135	13.33	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0
C136	13.33	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0
C541	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C542	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C543	13.33	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0
C544	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C545	80	192	192	128	128	288	192	3.4641	2.3094	0	0
C546	160	768	768	256	256	1152	384	6.9282	2.3094	0	0
C547	160	768	768	256	256	1152	384	6.9282	2.3094	0	0
C548	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C554	80	192	192	128	128	288	192	3.4641	2.3094	0	0
C555	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C556	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C557	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C558	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C559	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C560	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C562	13.33	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0
C565	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C566	13.33	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0
C567	160	768	768	256	256	1152	384	6.9282	2.3094	0	0
C568	13.33	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0
C570	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
C574	80	192	192	128	128	288	192	3.4641	2.3094	0	0
C577	160	768	768	256	256	1152	384	6.9282	2.3094	0	0
C665	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
RB-1	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-10	173.33	901.33	901.33	277.33	277.33	1352	416	7.5056	2.3094	0	0
RB-11	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-12	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
RB-13	106.67	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0
RB-15	213.33	1365.33	1365.33	341.33	341.33	2048	512	9.2376	2.3094	0	0
RB-2	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-3	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-4	533.33	8533.33	8533.33	853.33	853.33	12800	1280	23.094	2.3094	0	0
RB-5	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-6	426.67	5461.33	5461.33	682.67	682.67	8192	1024	18.4752	2.3094	0	0
RB-7	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-8	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
RB-9	200	1200	1200	320	320	1800	480	8.6603	2.3094	0	0
STEEL COLUMN	30	36	36	36	36	54	54	1.7321	1.7321	0	0
TB-1	80	192	192	128	128	288	192	3.4641	2.3094	0	0

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3)

Name	PNA Offset 2 in	Area Modifier	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
C119	0	1	1	1	1	1	1	1	1
C120	0	1	1	1	1	1	1	1	1
C121	0	1	1	1	1	1	1	1	1
C122	0	1	1	1	1	1	1	1	1
C123	0	1	1	1	1	1	1	1	1
C124	0	1	1	1	1	1	1	1	1
C125	0	1	1	1	1	1	1	1	1
C126	0	1	1	1	1	1	1	1	1
C128	0	1	1	1	1	1	1	1	1
C129	0	1	1	1	1	1	1	1	1
C130	0	1	1	1	1	1	1	1	1
C131	0	1	1	1	1	1	1	1	1
C134	0	1	1	1	1	1	1	1	1
C135	0	1	1	1	1	1	1	1	1
C136	0	1	1	1	1	1	1	1	1
C541	0	1	1	1	1	1	1	1	1
C542	0	1	1	1	1	1	1	1	1
C543	0	1	1	1	1	1	1	1	1
C544	0	1	1	1	1	1	1	1	1
C545	0	1	1	1	1	1	1	1	1
C546	0	1	1	1	1	1	1	1	1
C547	0	1	1	1	1	1	1	1	1
C548	0	1	1	1	1	1	1	1	1
C554	0	1	1	1	1	1	1	1	1
C555	0	1	1	1	1	1	1	1	1
C556	0	1	1	1	1	1	1	1	1
C557	0	1	1	1	1	1	1	1	1
C558	0	1	1	1	1	1	1	1	1
C559	0	1	1	1	1	1	1	1	1
C560	0	1	1	1	1	1	1	1	1
C562	0	1	1	1	1	1	1	1	1
C565	0	1	1	1	1	1	1	1	1
C566	0	1	1	1	1	1	1	1	1
C567	0	1	1	1	1	1	1	1	1
C568	0	1	1	1	1	1	1	1	1
C570	0	1	1	1	1	1	1	1	1
C574	0	1	1	1	1	1	1	1	1
C577	0	1	1	1	1	1	1	1	1
C665	0	1	1	1	1	1	1	1	1
RB-1	0	1	1	1	1	1	1	1	1
RB-10	0	1	1	1	1	1	1	1	1
RB-11	0	1	1	1	1	1	1	1	1
RB-12	0	1	1	1	1	1	1	1	1
RB-13	0	1	1	1	1	1	1	1	1

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3, continued)

Name	PNA Offset 2 in	Area Modifier	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
RB-15	0	1	1	1	1	1	1	1	1
RB-2	0	1	1	1	1	1	1	1	1
RB-3	0	1	1	1	1	1	1	1	1
RB-4	0	1	1	1	1	1	1	1	1
RB-5	0	1	1	1	1	1	1	1	1
RB-6	0	1	1	1	1	1	1	1	1
RB-7	0	1	1	1	1	1	1	1	1
RB-8	0	1	1	1	1	1	1	1	1
RB-9	0	1	1	1	1	1	1	1	1
STEEL COLUMN	0	1	1	1	1	1	1	1	1
TB-1	0	1	1	1	1	1	1	1	1

2.3 Shell Sections

Table 2.3 - Area Section Property Definitions - Summary

Name	Type	Element Type	Material	Total Thickness in
Col_{Stiff}	Slab	Shell-Thin	MAT2	8
DROP CAP	Slab	Shell-Thin	MAT1	12
Slab8	Slab	Shell-Thin	MAT1	8
Slab9	Slab	Shell-Thin	MAT1	9
WW101	Wall	Shell-Thick	MAT5	8
WW14	Wall	Shell-Thick	MAT5	8
WW16	Wall	Shell-Thick	MAT5	8
WW17	Wall	Shell-Thick	MAT5	8
WW18	Wall	Shell-Thick	MAT5	8
WW19	Wall	Shell-Thick	MAT5	8
WW24	Wall	Shell-Thick	MAT5	8
WW30	Wall	Shell-Thick	MAT5	8
WW32	Wall	Shell-Thick	MAT5	8
WW34	Wall	Shell-Thick	MAT5	8
WW37	Wall	Shell-Thick	MAT5	8
WW38	Wall	Shell-Thick	MAT5	8
WW39	Wall	Shell-Thick	MAT5	8
WW40	Wall	Shell-Thick	MAT5	8
WW42	Wall	Shell-Thick	MAT5	8
WW44	Wall	Shell-Thick	MAT5	8
WW45	Wall	Shell-Thick	MAT5	8
WW46	Wall	Shell-Thick	MAT5	8
WW47	Wall	Shell-Thick	MAT5	8
WW48	Wall	Shell-Thick	MAT5	8
WW53	Wall	Shell-Thick	MAT5	8
WW61	Wall	Shell-Thick	MAT5	8

Table 2.3 - Area Section Property Definitions - Summary (continued)

Name	Type	Element Type	Material	Total Thickness in
WW62	Wall	Shell-Thick	MAT5	8
WW63	Wall	Shell-Thick	MAT5	8
WW64	Wall	Shell-Thick	MAT5	8
WW66	Wall	Shell-Thick	MAT5	8
WW67	Wall	Shell-Thick	MAT5	8
WW75	Wall	Shell-Thick	MAT5	8
WW76	Wall	Shell-Thick	MAT5	8
WW77	Wall	Shell-Thick	MAT5	8
WW78	Wall	Shell-Thick	MAT5	8
WW79	Wall	Shell-Thick	MAT5	8
WW80	Wall	Shell-Thick	MAT5	8
WW81	Wall	Shell-Thick	MAT5	8
WW82	Wall	Shell-Thick	MAT5	8
WW83	Wall	Shell-Thick	MAT5	8
WW84	Wall	Shell-Thick	MAT5	8
WW85	Wall	Shell-Thick	MAT5	8
WW87	Wall	Shell-Thick	MAT5	8
WW88	Wall	Shell-Thick	MAT5	8
WW89	Wall	Shell-Thick	MAT5	8
WW90	Wall	Shell-Thick	MAT5	8
WW91	Wall	Shell-Thick	MAT5	8
WW92	Wall	Shell-Thick	MAT5	8
WW93	Wall	Shell-Thick	MAT5	8
WW94	Wall	Shell-Thick	MAT5	8
WW95	Wall	Shell-Thick	MAT5	8
WW96	Wall	Shell-Thick	MAT5	8
WW97	Wall	Shell-Thick	MAT5	8
WW98	Wall	Shell-Thick	MAT5	8

2.4 Reinforcement Sizes

Table 2.4 - Reinforcing Bar Sizes

Name	Diameter in	Area in2
#4	0.5	0.2
#9	1.128	1

3 Assignments

This chapter provides a listing of the assignments applied to the model.

3.1 Joint Assignments

Table 3.1 - Joint Assignments - Summary

UniqueName	Diaphragm	Restraints
119	From Area	
120	From Area	
121	From Area	
122	From Area	
123	From Area	
124	From Area	
125	From Area	
126	From Area	
128	From Area	
129	From Area	
130	From Area	
131	From Area	
134	From Area	
135	From Area	
136	From Area	
541	From Area	
542	From Area	
543	From Area	
544	From Area	
545	From Area	
546	From Area	
547	From Area	
548	From Area	
554	From Area	
555	From Area	
556	From Area	
557	From Area	
558	From Area	
559	From Area	
560	From Area	
562	From Area	
565	From Area	
566	From Area	
567	From Area	
568	From Area	
570	From Area	
574	From Area	
577	From Area	
662	From Area	
665	From Area	
41	From Area	
42	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
43	From Area	
44	From Area	
45	From Area	
46	From Area	
47	From Area	
48	From Area	
49	From Area	
50	From Area	
51	From Area	
52	From Area	
53	From Area	
54	From Area	
55	From Area	
56	From Area	
57	From Area	
58	From Area	
59	From Area	
60	From Area	
61	From Area	
62	From Area	
63	From Area	
64	From Area	
65	From Area	
66	From Area	
67	From Area	
68	From Area	
69	From Area	
70	From Area	
71	From Area	
72	From Area	
73	From Area	
74	From Area	
75	From Area	
76	From Area	
77	From Area	
78	From Area	
79	From Area	
80	From Area	
81	From Area	
82	From Area	
83	From Area	
84	From Area	
85	From Area	
86	From Area	
87	From Area	
88	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
89	From Area	
90	From Area	
91	From Area	
92	From Area	
93	From Area	
94	From Area	
95	From Area	
96	From Area	
97	From Area	
98	From Area	
99	From Area	
100	From Area	
101	From Area	
102	From Area	
103	From Area	
104	From Area	
105	From Area	
106	From Area	
107	From Area	
108	From Area	
109	From Area	
110	From Area	
111	From Area	
112	From Area	
113	From Area	
114	From Area	
115	From Area	
116	From Area	
117	From Area	
118	From Area	
127	From Area	
132	From Area	
133	From Area	
137	From Area	
138	From Area	
139	From Area	
140	From Area	
141	From Area	
142	From Area	
143	From Area	
144	From Area	
145	From Area	
146	From Area	
147	From Area	
148	From Area	
149	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
150	From Area	
151	From Area	
152	From Area	
153	From Area	
154	From Area	
155	From Area	
156	From Area	
157	From Area	
158	From Area	
159	From Area	
160	From Area	
161	From Area	
162	From Area	
163	From Area	
164	From Area	
165	From Area	
166	From Area	
167	From Area	
168	From Area	
169	From Area	
170	From Area	
171	From Area	
172	From Area	
173	From Area	
174	From Area	
175	From Area	
176	From Area	
177	From Area	
178	From Area	
179	From Area	
180	From Area	
181	From Area	
182	From Area	
183	From Area	
184	From Area	
185	From Area	
186	From Area	
187	From Area	
188	From Area	
189	From Area	
190	From Area	
191	From Area	
192	From Area	
193	From Area	
194	From Area	
195	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
196	From Area	
197	From Area	
198	From Area	
199	From Area	
200	From Area	
201	From Area	
202	From Area	
203	From Area	
204	From Area	
205	From Area	
206	From Area	
207	From Area	
208	From Area	
209	From Area	
210	From Area	
211	From Area	
212	From Area	
213	From Area	
214	From Area	
215	From Area	
216	From Area	
217	From Area	
218	From Area	
219	From Area	
220	From Area	
221	From Area	
222	From Area	
223	From Area	
224	From Area	
225	From Area	
226	From Area	
227	From Area	
228	From Area	
229	From Area	
230	From Area	
231	From Area	
232	From Area	
233	From Area	
234	From Area	
235	From Area	
236	From Area	
237	From Area	
238	From Area	
239	From Area	
240	From Area	
241	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
242	From Area	
243	From Area	
244	From Area	
245	From Area	
246	From Area	
247	From Area	
248	From Area	
249	From Area	
250	From Area	
251	From Area	
256	From Area	
257	From Area	
258	From Area	
259	From Area	
1	From Area	
2	From Area	
3	From Area	
4	From Area	
5	From Area	
6	From Area	
7	From Area	
8	From Area	
9	From Area	
10	From Area	
11	From Area	
12	From Area	
13	From Area	
14	From Area	
15	From Area	
16	From Area	
17	From Area	
18	From Area	
19	From Area	
20	From Area	
21	From Area	
22	From Area	
23	From Area	
24	From Area	
25	From Area	
26	From Area	
27	From Area	
28	From Area	
29	From Area	
30	From Area	
31	From Area	
32	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
33	From Area	
34	From Area	
35	From Area	
36	From Area	
37	From Area	
38	From Area	
39	From Area	
40	From Area	
336	From Area	
337	From Area	
338	From Area	
339	From Area	
340	From Area	
341	From Area	
342	From Area	
343	From Area	
344	From Area	
345	From Area	
346	From Area	
347	From Area	
348	From Area	
349	From Area	
350	From Area	
351	From Area	
352	From Area	
353	From Area	
354	From Area	
355	From Area	
356	From Area	
357	From Area	
358	From Area	
359	From Area	
360	From Area	
361	From Area	
362	From Area	
363	From Area	
364	From Area	
365	From Area	
366	From Area	
367	From Area	
368	From Area	
369	From Area	
370	From Area	
371	From Area	
372	From Area	
373	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
375	From Area	
376	From Area	
252	From Area	
253	From Area	
254	From Area	
255	From Area	
260	From Area	UX; UY; UZ; RX; RY; RZ
261	From Area	UX; UY; UZ; RX; RY; RZ
262	From Area	UX; UY; UZ; RX; RY; RZ
269	From Area	UX; UY; UZ; RX; RY; RZ
272	From Area	UX; UY; UZ; RX; RY; RZ
273	From Area	UX; UY; UZ; RX; RY; RZ
274	From Area	UX; UY; UZ; RX; RY; RZ
275	From Area	UX; UY; UZ; RX; RY; RZ
279	From Area	UX; UY; UZ; RX; RY; RZ
280	From Area	UX; UY; UZ; RX; RY; RZ
286	From Area	UX; UY; UZ; RX; RY; RZ
287	From Area	UX; UY; UZ; RX; RY; RZ
292	From Area	UX; UY; UZ; RX; RY; RZ
295	From Area	UX; UY; UZ; RX; RY; RZ
296	From Area	UX; UY; UZ; RX; RY; RZ
263	From Area	UX; UY; UZ; RX; RY; RZ
264	From Area	UX; UY; UZ; RX; RY; RZ
266	From Area	UX; UY; UZ; RX; RY; RZ
265	From Area	UX; UY; UZ; RX; RY; RZ
267	From Area	UX; UY; UZ; RX; RY; RZ
268	From Area	UX; UY; UZ; RX; RY; RZ
270	From Area	UX; UY; UZ; RX; RY; RZ
271	From Area	UX; UY; UZ; RX; RY; RZ
277	From Area	UX; UY; UZ; RX; RY; RZ
276	From Area	UX; UY; UZ; RX; RY; RZ
278	From Area	UX; UY; UZ; RX; RY; RZ
284	From Area	UX; UY; UZ; RX; RY; RZ
281	From Area	UX; UY; UZ; RX; RY; RZ
282	From Area	UX; UY; UZ; RX; RY; RZ
283	From Area	UX; UY; UZ; RX; RY; RZ
285	From Area	UX; UY; UZ; RX; RY; RZ
288	From Area	UX; UY; UZ; RX; RY; RZ
290	From Area	UX; UY; UZ; RX; RY; RZ
291	From Area	UX; UY; UZ; RX; RY; RZ
289	From Area	UX; UY; UZ; RX; RY; RZ
293	From Area	UX; UY; UZ; RX; RY; RZ
294	From Area	UX; UY; UZ; RX; RY; RZ
297	From Area	UX; UY; UZ; RX; RY; RZ
298	From Area	UX; UY; UZ; RX; RY; RZ
299	From Area	UX; UY; UZ; RX; RY; RZ

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
314	From Area	UX; UY; UZ; RX; RY; RZ
308	From Area	UX; UY; UZ; RX; RY; RZ
315	From Area	UX; UY; UZ; RX; RY; RZ
313	From Area	UX; UY; UZ; RX; RY; RZ
318	From Area	UX; UY; UZ; RX; RY; RZ
317	From Area	UX; UY; UZ; RX; RY; RZ
319	From Area	UX; UY; UZ; RX; RY; RZ
326	From Area	UX; UY; UZ; RX; RY; RZ
309	From Area	UX; UY; UZ; RX; RY; RZ
329	From Area	UX; UY; UZ; RX; RY; RZ
300	From Area	UX; UY; UZ; RX; RY; RZ
301	From Area	UX; UY; UZ; RX; RY; RZ
302	From Area	UX; UY; UZ; RX; RY; RZ
303	From Area	UX; UY; UZ; RX; RY; RZ
304	From Area	UX; UY; UZ; RX; RY; RZ
305	From Area	UX; UY; UZ; RX; RY; RZ
306	From Area	UX; UY; UZ; RX; RY; RZ
307	From Area	UX; UY; UZ; RX; RY; RZ
310	From Area	UX; UY; UZ; RX; RY; RZ
311	From Area	UX; UY; UZ; RX; RY; RZ
312	From Area	UX; UY; UZ; RX; RY; RZ
316	From Area	UX; UY; UZ; RX; RY; RZ
320	From Area	UX; UY; UZ; RX; RY; RZ
321	From Area	UX; UY; UZ; RX; RY; RZ
322	From Area	UX; UY; UZ; RX; RY; RZ
323	From Area	UX; UY; UZ; RX; RY; RZ
324	From Area	UX; UY; UZ; RX; RY; RZ
325	From Area	UX; UY; UZ; RX; RY; RZ
327	From Area	UX; UY; UZ; RX; RY; RZ
328	From Area	UX; UY; UZ; RX; RY; RZ
331	From Area	UX; UY; UZ; RX; RY; RZ
330	From Area	UX; UY; UZ; RX; RY; RZ
332	From Area	UX; UY; UZ; RX; RY; RZ
333	From Area	UX; UY; UZ; RX; RY; RZ
335	From Area	UX; UY; UZ; RX; RY; RZ
334	From Area	UX; UY; UZ; RX; RY; RZ

3.2 Frame Assignments

Table 3.2 - Frame Assignments - Summary

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B23	Beam	13.2071	RB-2	RB-2		3
B278	Beam	9.5	RB-1	RB-1		3
B279	Beam	13.3398	RB-2	RB-2		3
B281	Beam	10.9375	RB-4	RB-4		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B39	Beam	15.2188	RB-5	RB-5		3
B40	Beam	6.625	TB-1	TB-1		3
B67	Beam	6.0833	TB-1	TB-1		3
B68	Beam	4.93	TB-1	TB-1		3
B283	Beam	13.4773	RB-7	RB-7		3
B75	Beam	14.3434	RB-8	RB-8		3
B287	Beam	7.1731	RB-9	RB-9		3
B131	Beam	13.8432	RB-9	RB-9		3
B288	Beam	13.7344	RB-8	RB-8		3
B289	Beam	14.2396	RB-8	RB-8		3
B74	Beam	5.9951	TB-1	TB-1		3
B49	Beam	6.2918	TB-1	TB-1		3
B52	Beam	14.1962	RB-10	RB-10		3
B56	Beam	12.8452	RB-10	RB-10		3
B290	Beam	12.3073	RB-10	RB-10		3
B291	Beam	5.4896	TB-1	TB-1		3
B292	Beam	24.156	RB-6	RB-6		3
B46	Beam	5.9951	TB-1	TB-1		3
B293	Beam	5.9951	TB-1	TB-1		3
B13	Beam	16.8982	RB-3	RB-3		3
B311	Beam	2.8747	RB-11	RB-11		3
B312	Beam	8.9414	RB-11	RB-11		3
B69	Beam	8.5	RB-12	RB-12		3
B280	Beam	10.2364	RB-13	RB-13		3
B282	Beam	8.5	RB-12	RB-12		3
B285	Beam	5.9951	TB-1	TB-1		3
B295	Beam	23.2188	RB-15	RB-15		3
82	Column	11.5	C119	N/A	270	3
83	Column	11.5	C120	N/A	270	3
84	Column	11.5	C121	N/A		3
85	Column	11.5	C541	N/A		3
86	Column	11.5	C542	N/A	270	3
87	Column	11.5	C544	N/A	90	3
88	Column	11.5	C543	N/A	90	3
89	Column	11.5	C545	N/A	90	3
90	Column	11.5	C546	N/A		3
91	Column	11.5	C122	N/A	180	3
92	Column	11.5	C547	N/A	90	3
93	Column	11.5	C548	N/A	90	3
94	Column	11.5	C123	N/A	270	3
95	Column	11.5	C124	N/A	90	3
96	Column	11.5	C125	N/A	90	3
97	Column	11.5	C126	N/A	90	3
98	Column	11.5	C555	N/A	90	3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
99	Column	11.5	C554	N/A	90	3
100	Column	11.5	C556	N/A	180	3
101	Column	11.5	C128	N/A	180	3
102	Column	11.5	C129	N/A	180	3
103	Column	11.5	C558	N/A	180	3
104	Column	11.5	C559	N/A	180	3
105	Column	11.5	C560	N/A		3
106	Column	11.5	C557	N/A		3
107	Column	11.5	C562	N/A		3
108	Column	11.5	C130	N/A	90	3
109	Column	11.5	C131	N/A	90	3
110	Column	11.5	C565	N/A		3
111	Column	11.5	C568	N/A		3
112	Column	11.5	C566	N/A		3
113	Column	11.5	C567	N/A		3
114	Column	11.5	C134	N/A	270	3
115	Column	11.5	C570	N/A	90	3
116	Column	11.5	C574	N/A		3
117	Column	11.5	C135	N/A		3
118	Column	11.5	C136	N/A		3
119	Column	11.5	C577	N/A	90	3
120	Column	11.5	STEEL COLUMN	N/A	180	3
121	Column	11.5	C665	N/A		3
WW48	Null	8.1177		N/A		3
WW66	Null	2.8679		N/A		3
WW67	Null	2.6479		N/A		3
WW30	Null	19.1562		N/A		3
WW32	Null	0.8475		N/A		3
WW34	Null	8.0412		N/A		3
WW75	Null	8.0379		N/A		3
WW76	Null	9.2808		N/A		3
WW77	Null	5.9951		N/A		3
WW78	Null	8.2187		N/A		3
WW79	Null	10.9375		N/A		3
WW80	Null	2.2486		N/A		3
WW81	Null	2.1697		N/A		3
WW37	Null	6.6354		N/A		3
WW38	Null	4.5417		N/A		3
WW39	Null	6.6354		N/A		3
WW40	Null	10.9375		N/A		3
WW63	Null	2		N/A		3
WW64	Null	3.5625		N/A		3
WW42	Null	7.5208		N/A		3
WW61	Null	3.6458		N/A		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
WW62	Null	3.6458		N/A		3
WW82	Null	1.9271		N/A		3
WW83	Null	23.1592		N/A		3
WW44	Null	9.2481		N/A		3
WW17	Null	14.9792		N/A		3
WW18	Null	8.2396		N/A		3
WW14	Null	5.4896		N/A		3
WW53	Null	2.2519		N/A		3
WW84	Null	20.9668		N/A		3
WW45	Null	6.4354		N/A		3
WW46	Null	6.2918		N/A		3
WW47	Null	6.4354		N/A		3
WW85	Null	8.6048		N/A		3
WW87	Null	2.5176		N/A		3
WW19	Null	6.1667		N/A		3
WW24	Null	7.4372		N/A		3
WW88	Null	4.9869		N/A		3
WW89	Null	3.4356		N/A		3
WW90	Null	1.4577		N/A		3
WW91	Null	5.5736		N/A		3
WW92	Null	0.8475		N/A		3
WW94	Null	17.4226		N/A		3
WW95	Null	2.6327		N/A		3
WW96	Null	4.2413		N/A		3
WW93	Null	8.0379		N/A		3
WW97	Null	6.0313		N/A		3
WW98	Null	1.6075		N/A		3
WW16	Null	12.4115		N/A		3
WW101	Null	0.451		N/A		3

3.3 Shell Assignments

Table 3.3 - Area Assignments - Summary

UniqueName	Section Property	Property Type	Axis Angle deg
ColC119	Col_{Stiff}	Slab	
ColC120	Col_{Stiff}	Slab	
ColC121	Col_{Stiff}	Slab	
ColC541	Col_{Stiff}	Slab	
ColC542	Col_{Stiff}	Slab	
ColC544	Col_{Stiff}	Slab	
ColC543	Col_{Stiff}	Slab	
ColC545	Col_{Stiff}	Slab	
ColC546	Col_{Stiff}	Slab	

Table 3.3 - Area Assignments - Summary (continued)

UniqueName	Section Property	Property Type	Axis Angle deg
ColC122	Col_{Stiff}	Slab	
ColC547	Col_{Stiff}	Slab	
ColC548	Col_{Stiff}	Slab	
ColC123	Col_{Stiff}	Slab	
ColC124	Col_{Stiff}	Slab	
ColC125	Col_{Stiff}	Slab	
ColC126	Col_{Stiff}	Slab	
ColC555	Col_{Stiff}	Slab	
ColC554	Col_{Stiff}	Slab	
ColC556	Col_{Stiff}	Slab	
ColC128	Col_{Stiff}	Slab	
ColC129	Col_{Stiff}	Slab	
ColC558	Col_{Stiff}	Slab	
ColC559	Col_{Stiff}	Slab	
ColC560	Col_{Stiff}	Slab	
ColC557	Col_{Stiff}	Slab	
ColC562	Col_{Stiff}	Slab	
ColC130	Col_{Stiff}	Slab	
ColC131	Col_{Stiff}	Slab	
ColC565	Col_{Stiff}	Slab	
ColC568	Col_{Stiff}	Slab	
ColC566	Col_{Stiff}	Slab	
ColC567	Col_{Stiff}	Slab	
ColC134	Col_{Stiff}	Slab	
ColC570	Col_{Stiff}	Slab	
ColC574	Col_{Stiff}	Slab	
ColC135	Col_{Stiff}	Slab	
ColC136	Col_{Stiff}	Slab	
ColC577	Col_{Stiff}	Slab	
ColC665	Col_{Stiff}	Slab	
2	Slab8	Slab	
4	Slab9	Slab	
F3	Slab8	Slab	
42	WW48	Wall	
43	WW66	Wall	
44	WW67	Wall	
45	WW30	Wall	
46	WW32	Wall	
47	WW34	Wall	
48	WW75	Wall	
49	WW76	Wall	
50	WW77	Wall	
51	WW78	Wall	
52	WW79	Wall	

Table 3.3 - Area Assignments - Summary (continued)

UniqueName	Section Property	Property Type	Axis Angle deg
53	WW80	Wall	
54	WW81	Wall	
55	WW37	Wall	
56	WW38	Wall	
57	WW39	Wall	
58	WW40	Wall	
59	WW63	Wall	
60	WW64	Wall	
61	WW42	Wall	
62	WW61	Wall	
63	WW62	Wall	
64	WW82	Wall	
65	WW83	Wall	
66	WW44	Wall	
67	WW17	Wall	
68	WW18	Wall	
69	WW14	Wall	
70	WW53	Wall	
71	WW84	Wall	
72	WW45	Wall	
73	WW46	Wall	
74	WW47	Wall	
75	WW85	Wall	
76	WW87	Wall	
77	WW19	Wall	
78	WW24	Wall	
79	WW88	Wall	
80	WW89	Wall	
81	WW90	Wall	
82	WW91	Wall	
83	WW92	Wall	
84	WW94	Wall	
85	WW95	Wall	
86	WW96	Wall	
87	WW93	Wall	
88	WW97	Wall	
89	WW98	Wall	
90	WW16	Wall	
91	WW101	Wall	

4 Loads

This chapter provides loading information as applied to the model.

4.1 Load Patterns

Table 4.1 - Load Pattern Definitions

Name	Is Auto Load	Type	Self Weight Multiplier
~LLRF	No	Other	0
Dead	No	Dead	1
Live	No	Live	0
SD	No	Super Dead	0

4.2 Applied Loads

4.2.1 Area Loads

Table 4.2 - Area Load Assignments - Uniform

UniqueName	Load Pattern	Direction	Load lb/ft2
2	Live	Gravity	30
4	Live	Gravity	30
F3	Live	Gravity	30
2	SD	Gravity	25
4	SD	Gravity	25
F3	SD	Gravity	25

4.3 Load Cases

Table 4.3 - Load Case Definitions - Summary

Name	Type
Dead	Linear Static
Live	Linear Static
SD	Linear Static
LCase1	Nonlinear Static
LCase2	Nonlinear Static
LCase3	Nonlinear Static
LCase4	Nonlinear Static
LCase5	Nonlinear Static

4.4 Load Combinations

Table 4.4 - Load Combination Definitions

Name	Type	Is Auto	Load Name	SF	Notes
Comb1	Linear Add	No	Dead	1	
Comb1			SD	1	
Comb1			Live	1	
LT LL	Linear Add	No	LCase3	1	
LT LL			LCase1	1	

Table 4.4 - Load Combination Definitions (continued)

Name	Type	Is Auto	Load Name	SF	Notes
LT LL			LCase2	-1	
LT LL			LCase5	-1	
LT SD+LL	Linear Add	No	LCase3	1	
LT SD+LL			LCase1	1	
LT SD+LL			LCase2	-1	
LT SD+LL			LCase4	-1	
LT TOTAL	Linear Add	No	LCase3	1	
LT TOTAL			LCase1	1	
LT TOTAL			LCase2	-1	
UDConS1	Linear Add	No	Dead	1.4	Dead [Strength]
UDConS1			SD	1.4	
UDConS2	Linear Add	No	Dead	1.2	Dead + Live [Strength]
UDConS2			Live	1.6	
UDConS2			SD	1.2	

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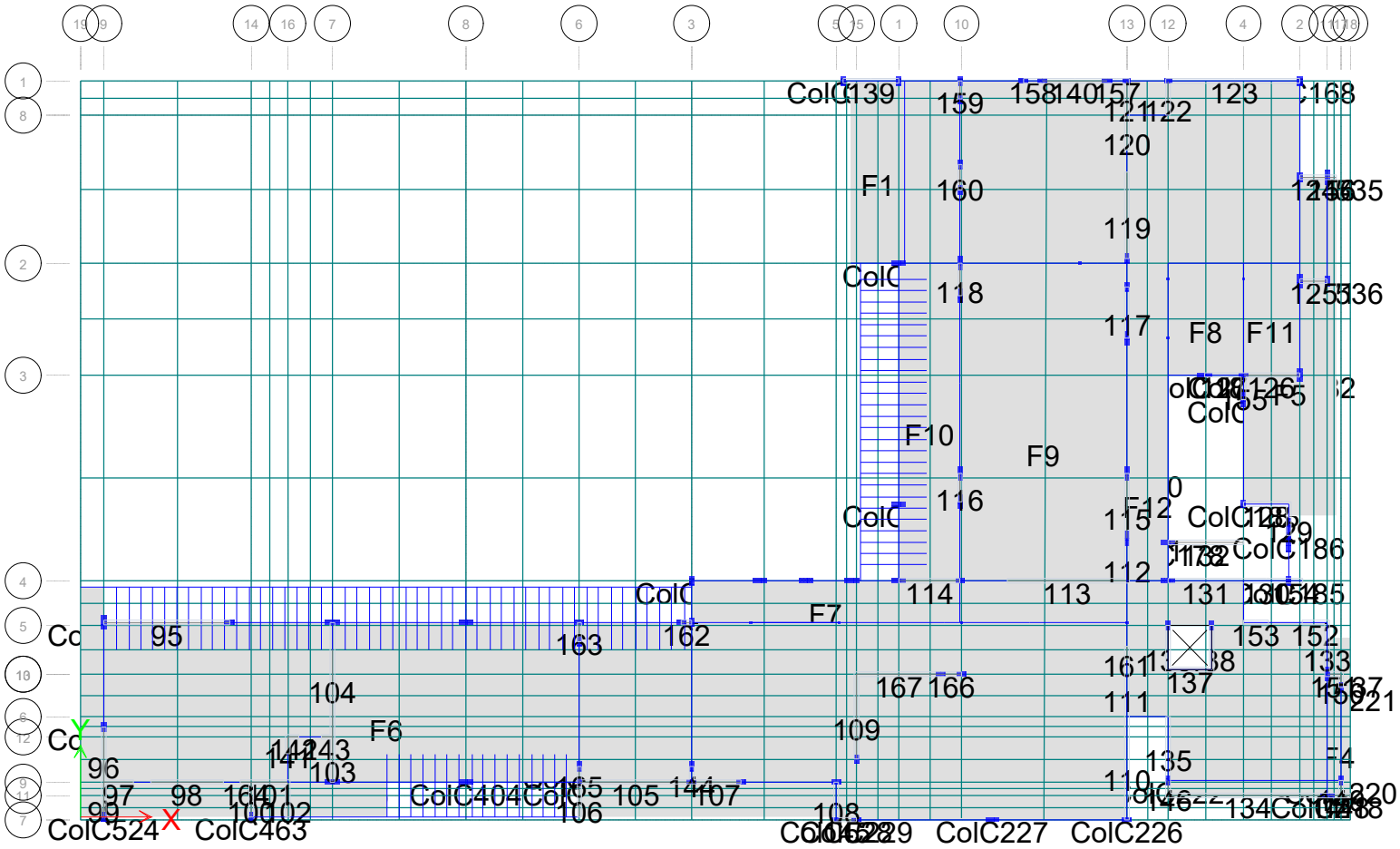
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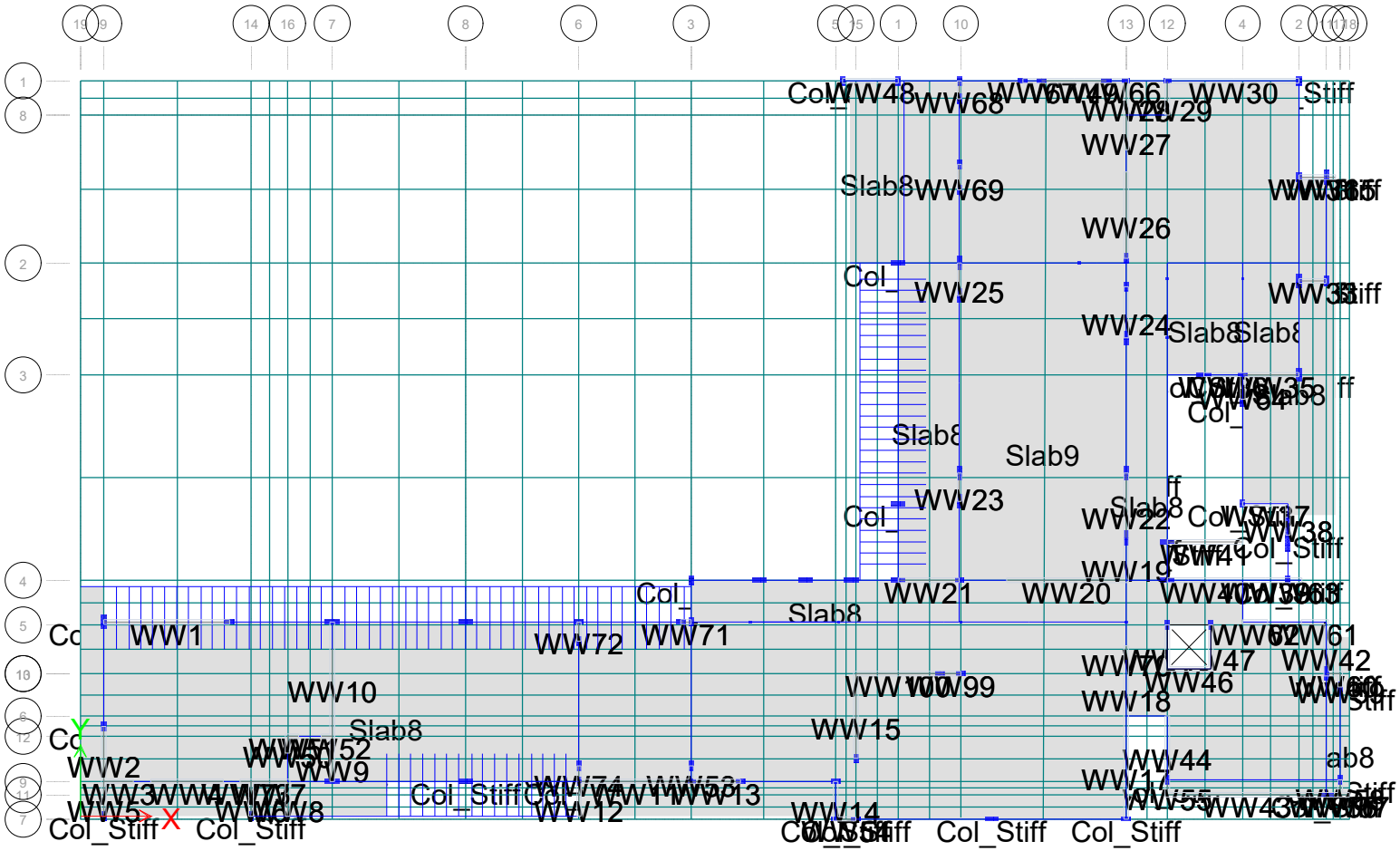
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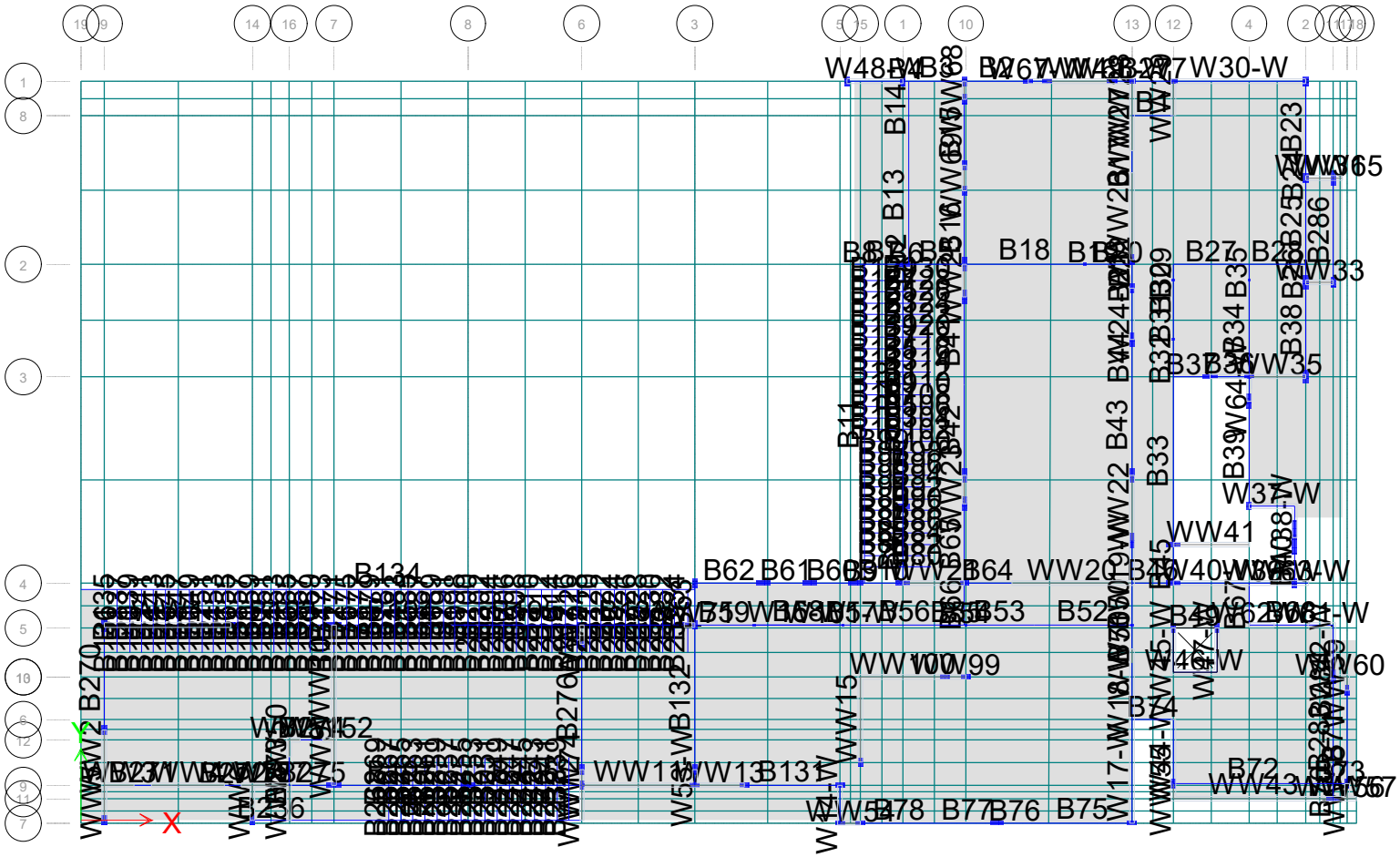
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B77
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B132
B276
B270
B286
WW33
WW35
WW65
B23
B43
B14
B13
B11
B34
B35
B38
B39
B40
B67
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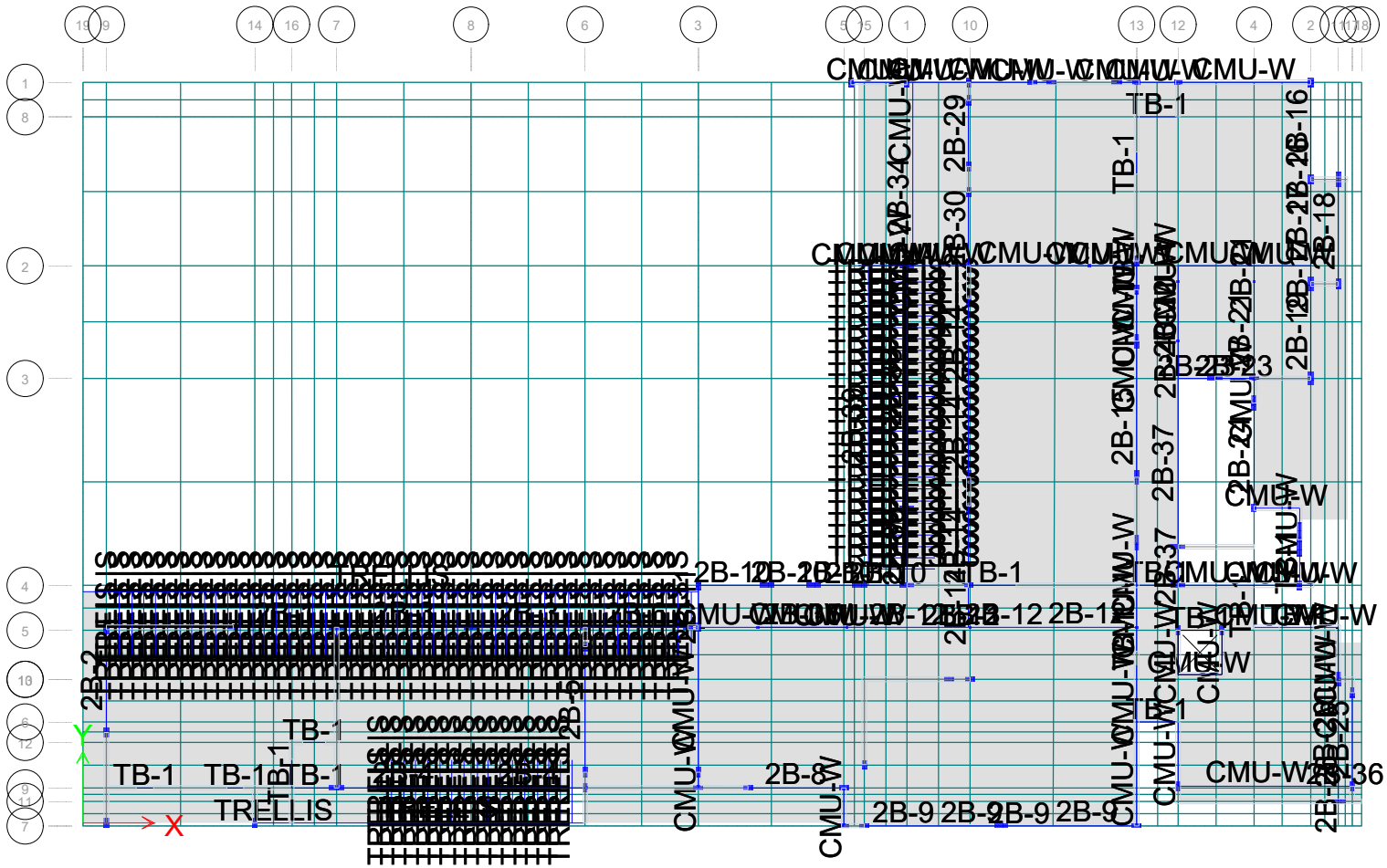
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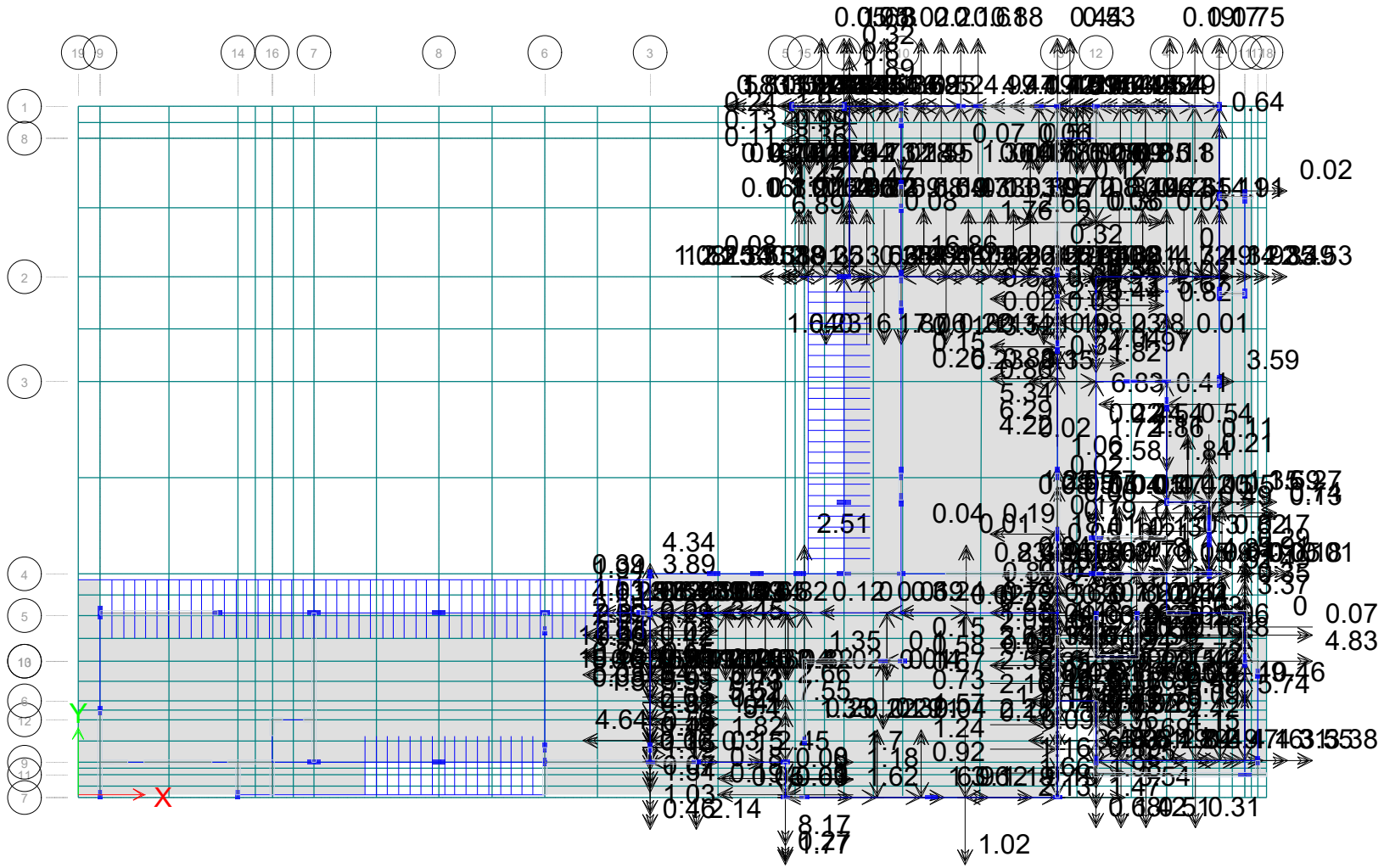

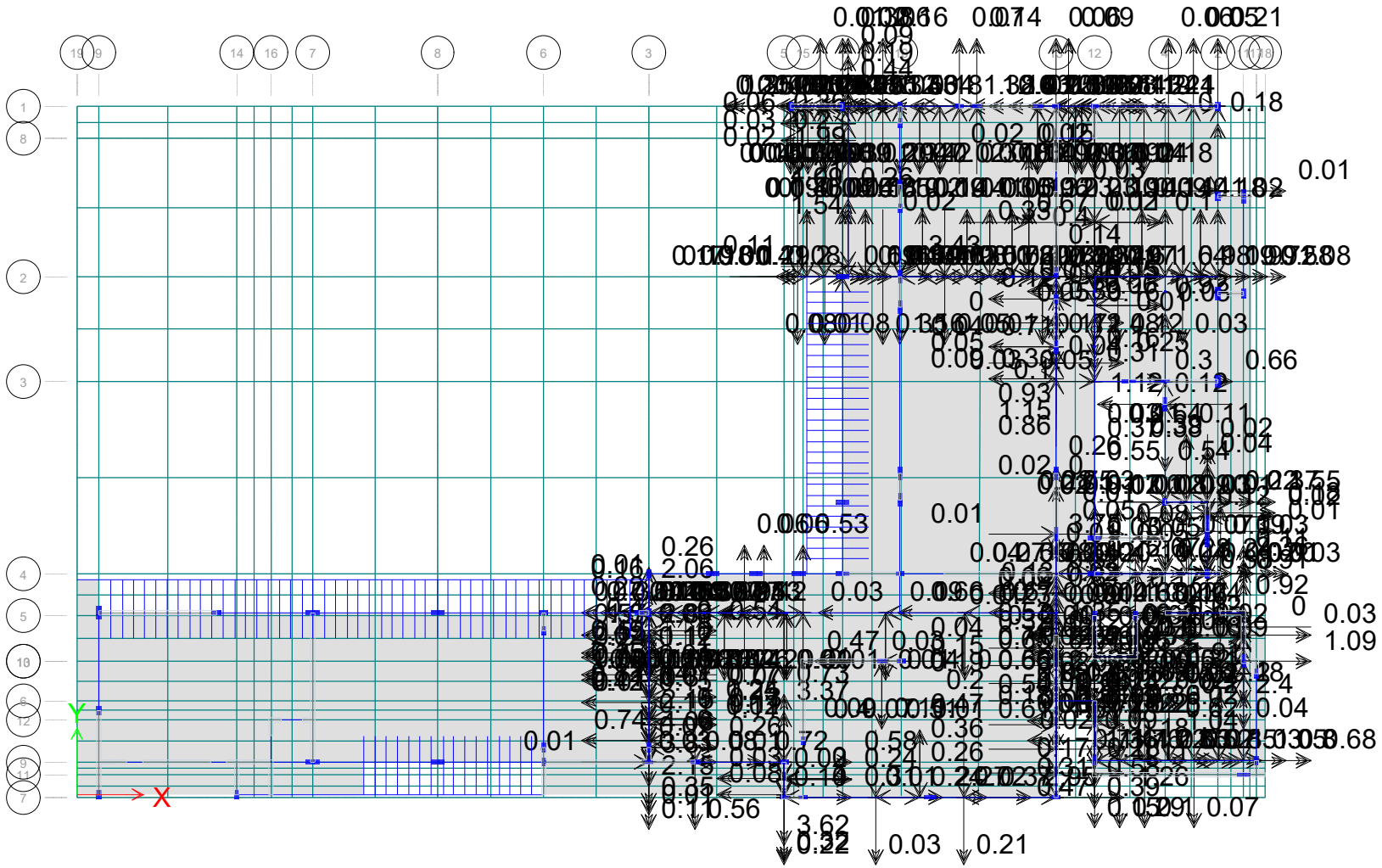

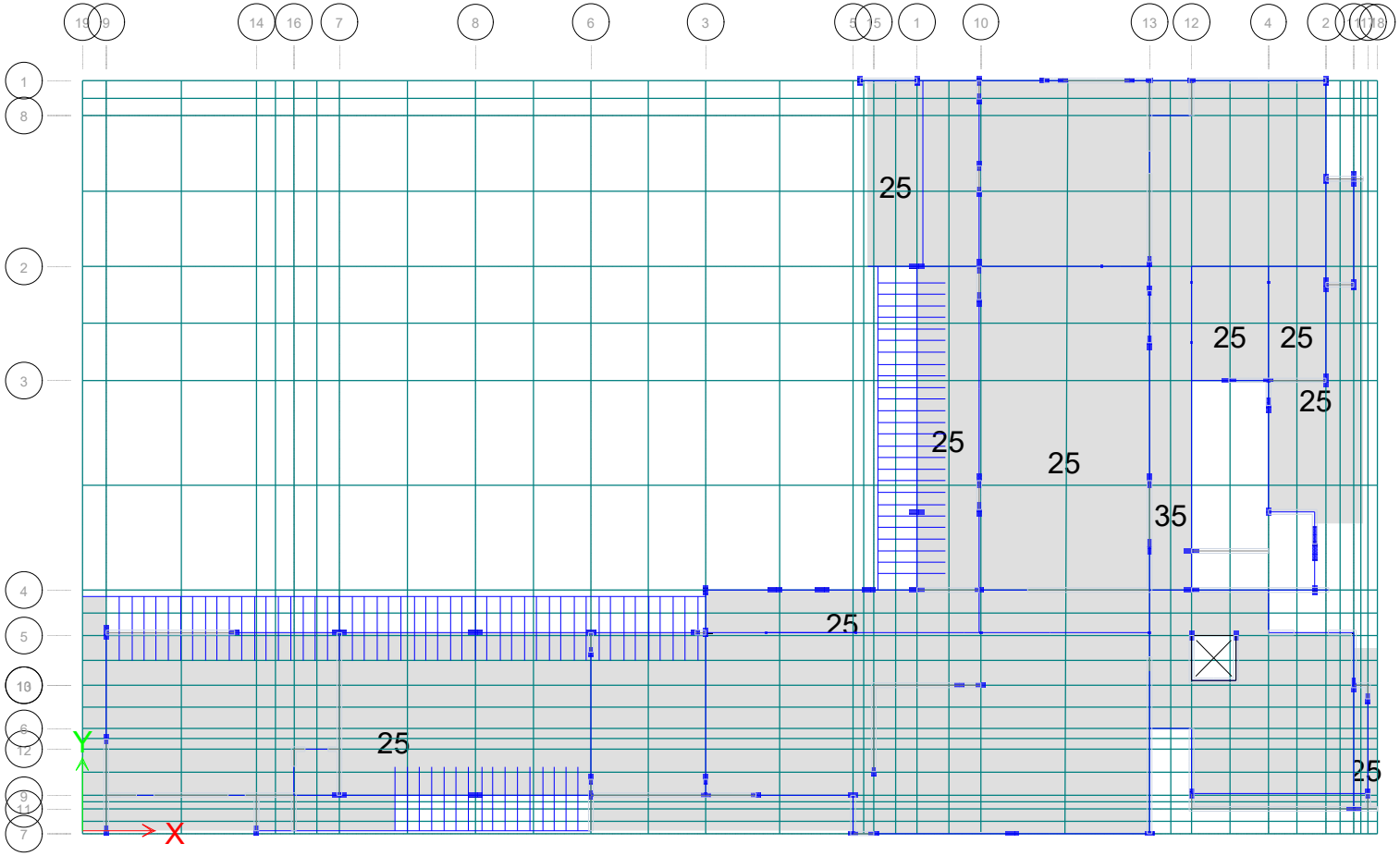
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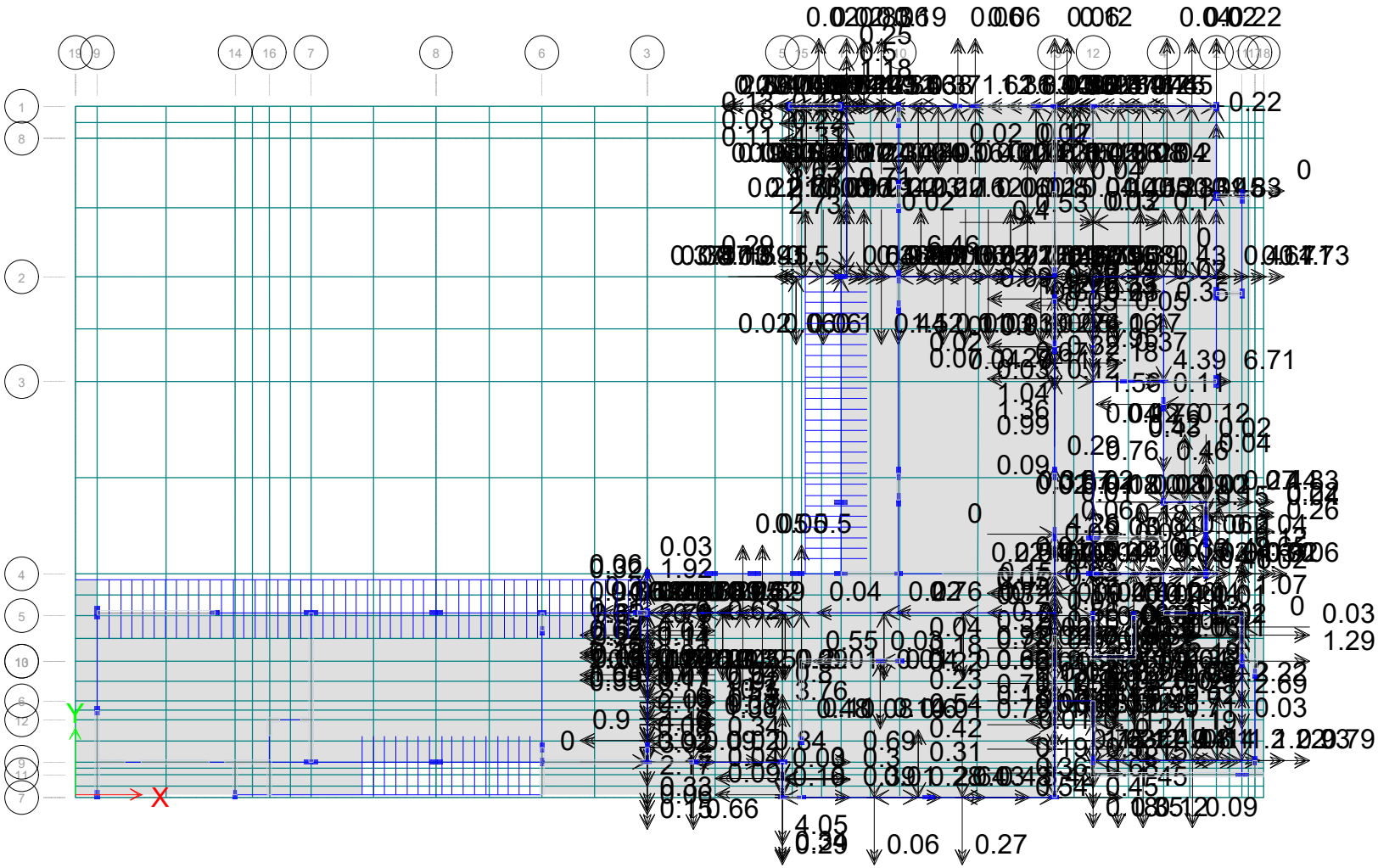

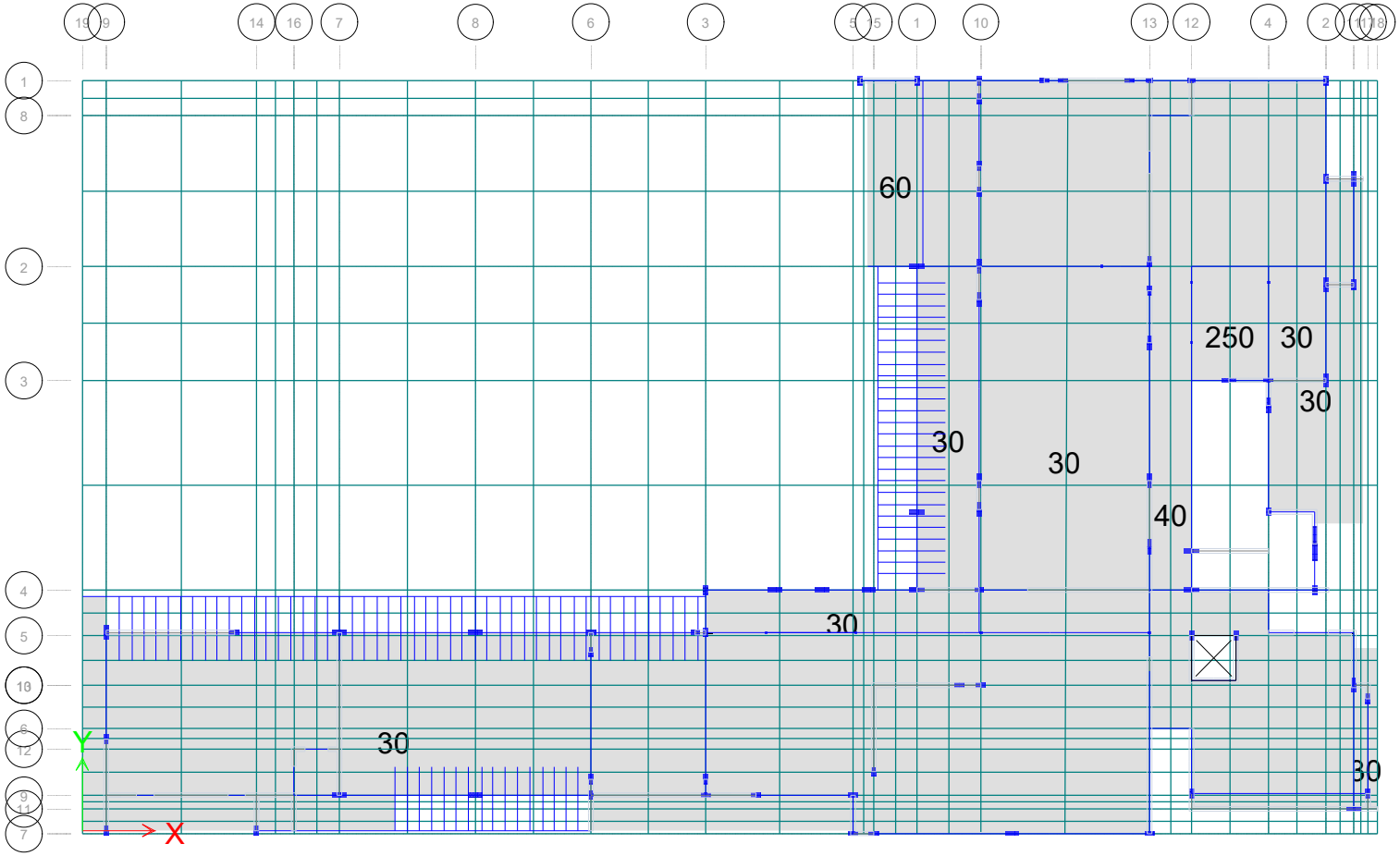
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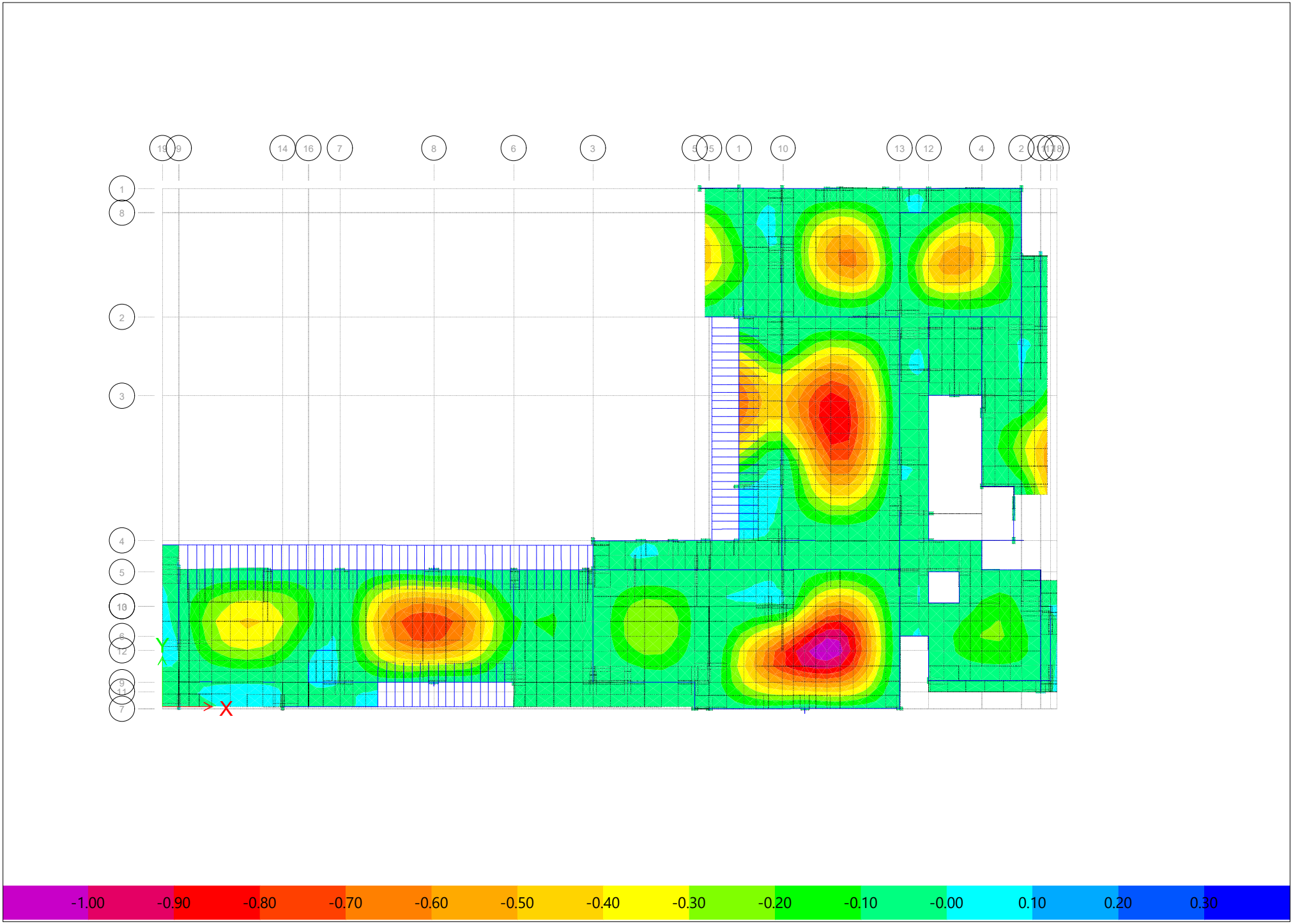
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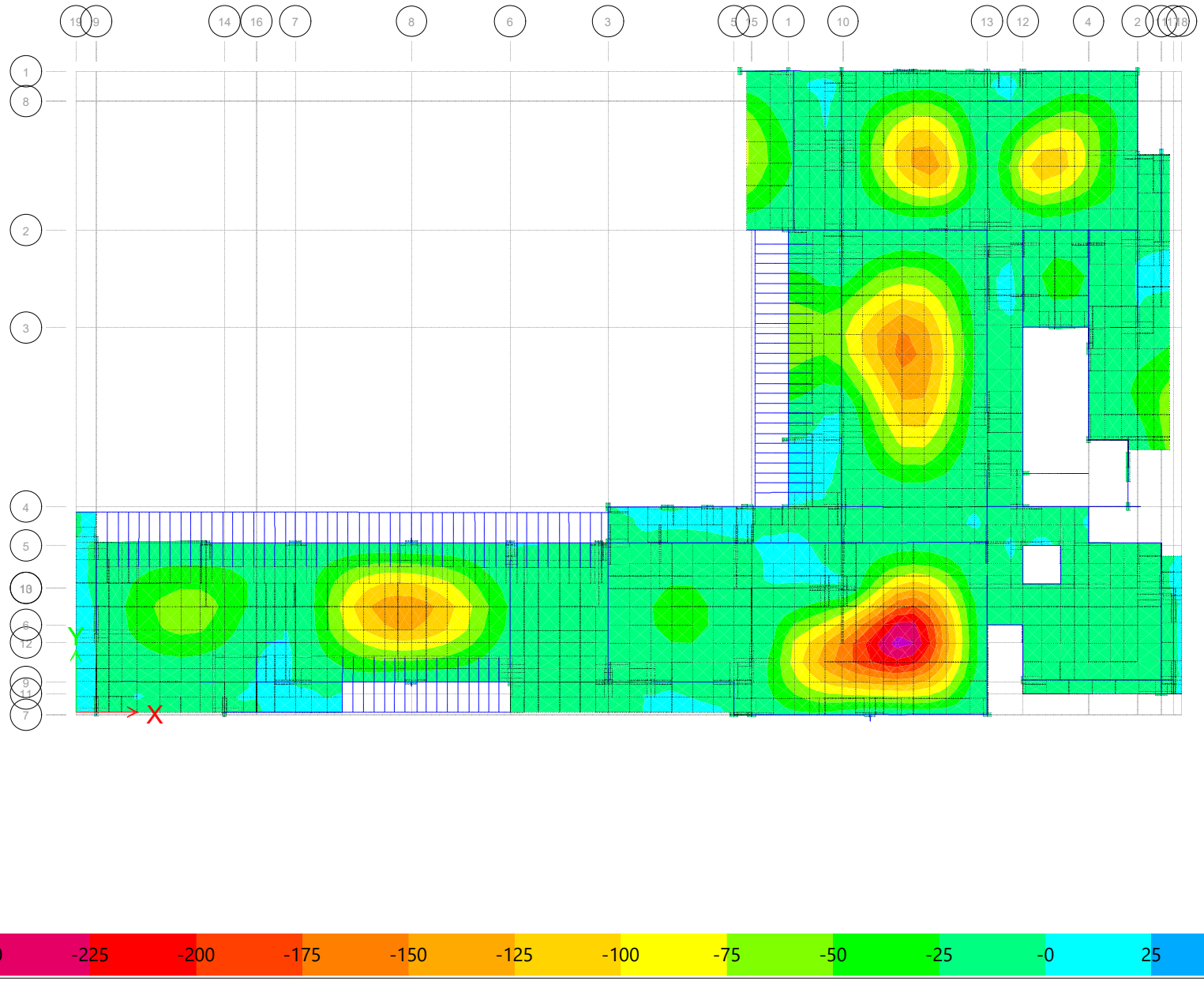
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75
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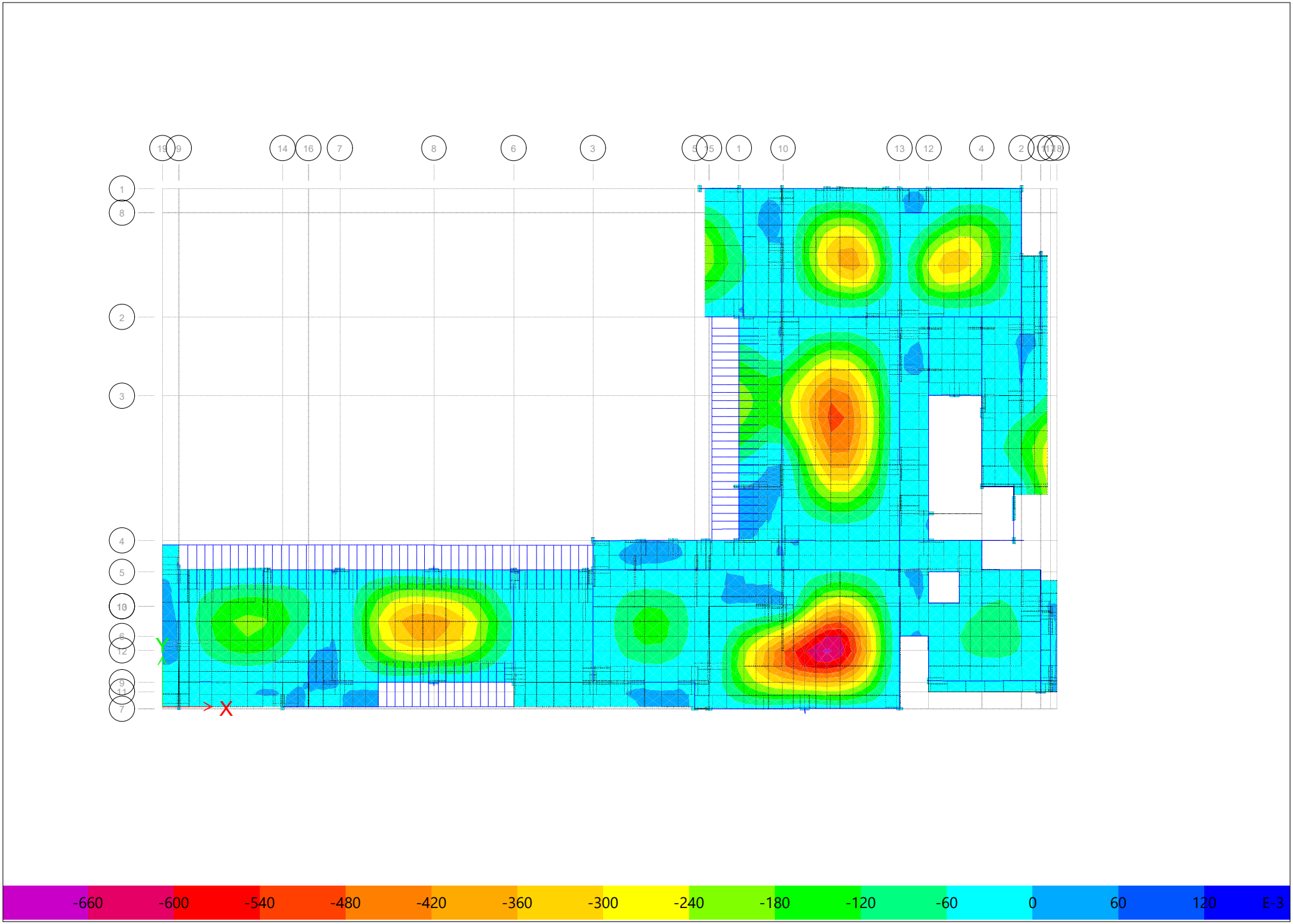
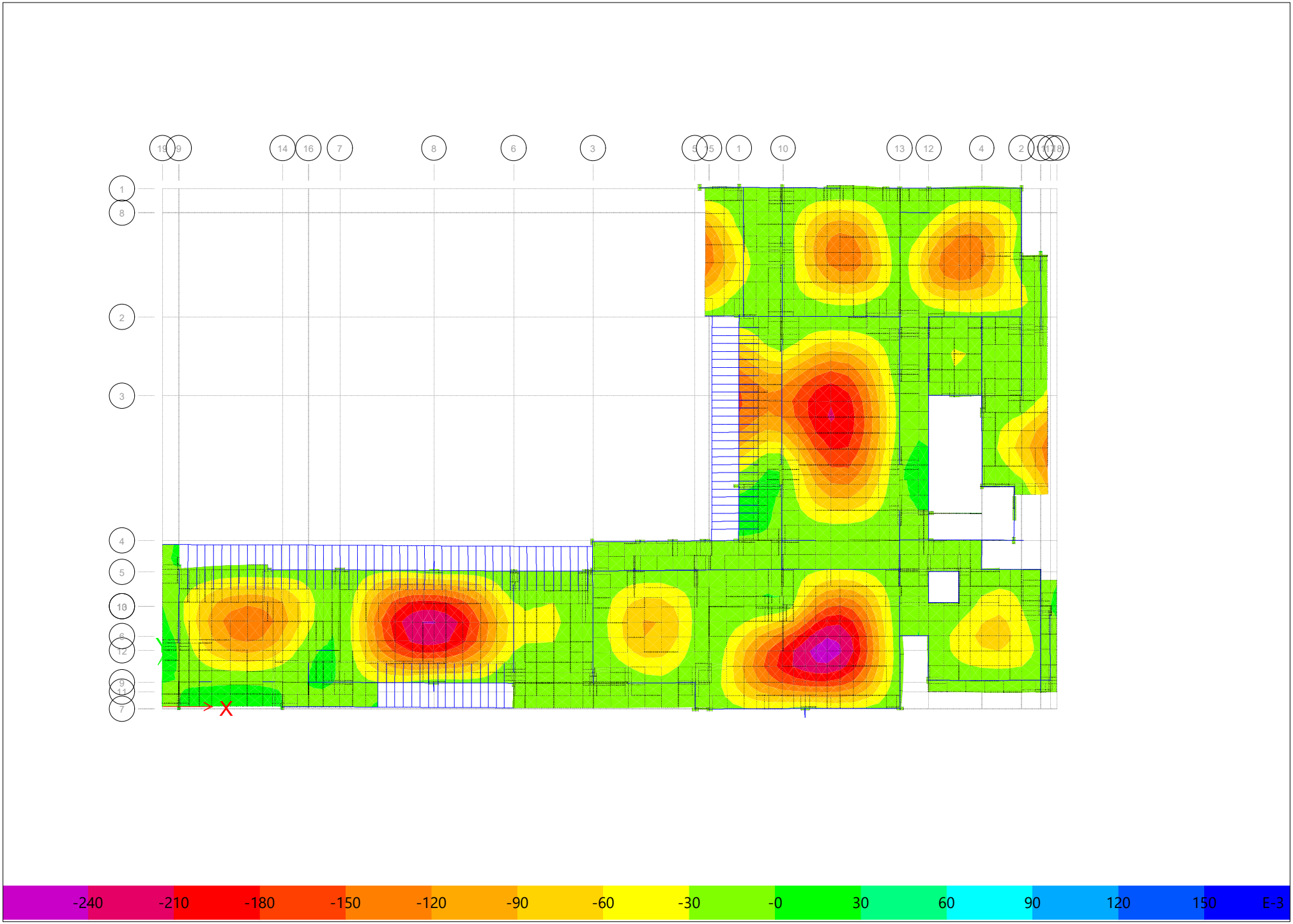


10840 SW 67 ave SECOND FLOOR.FDB Plan View - Story1 - Z = 0 (ft) - Displacements (LT SD+LL) [in]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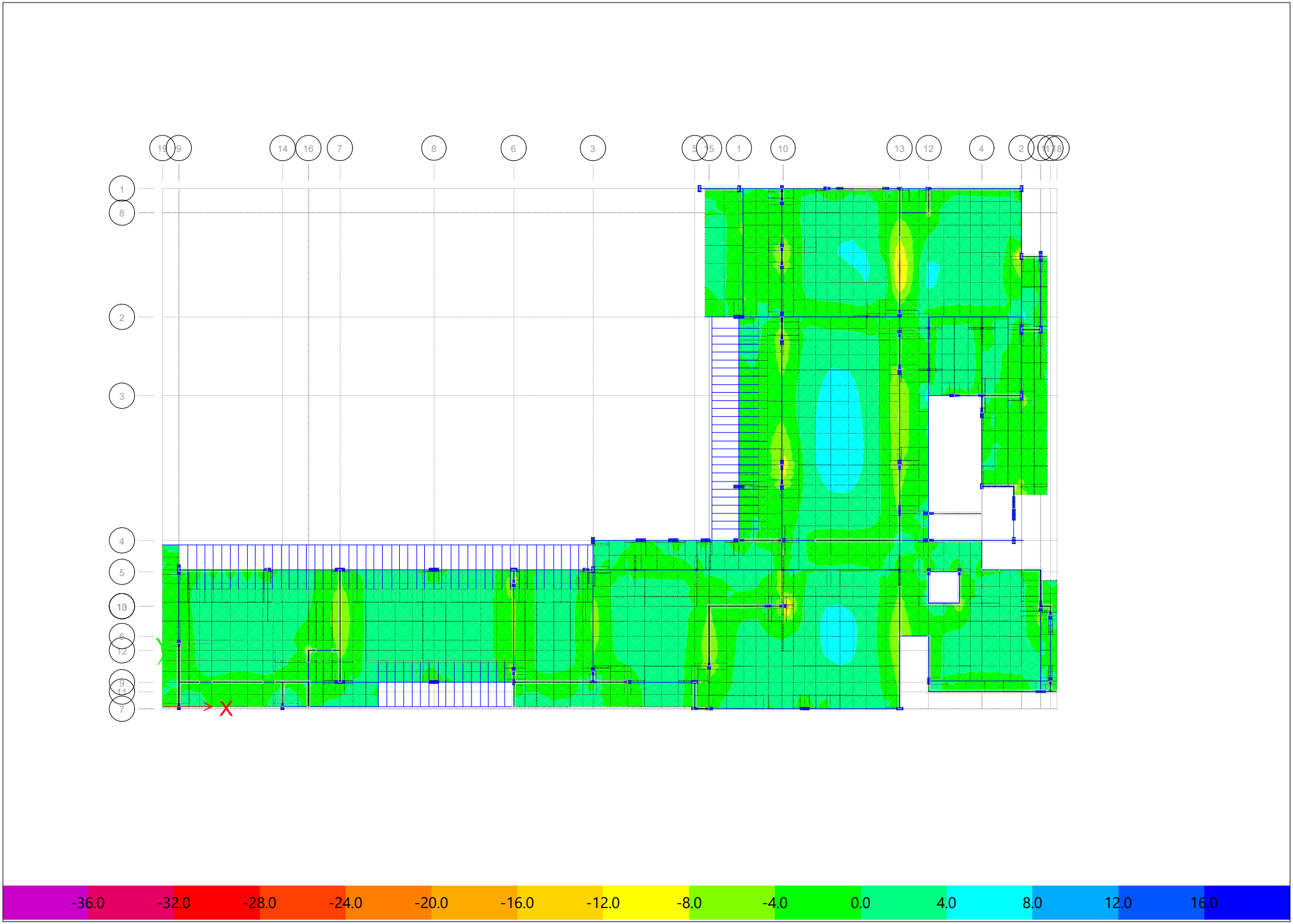
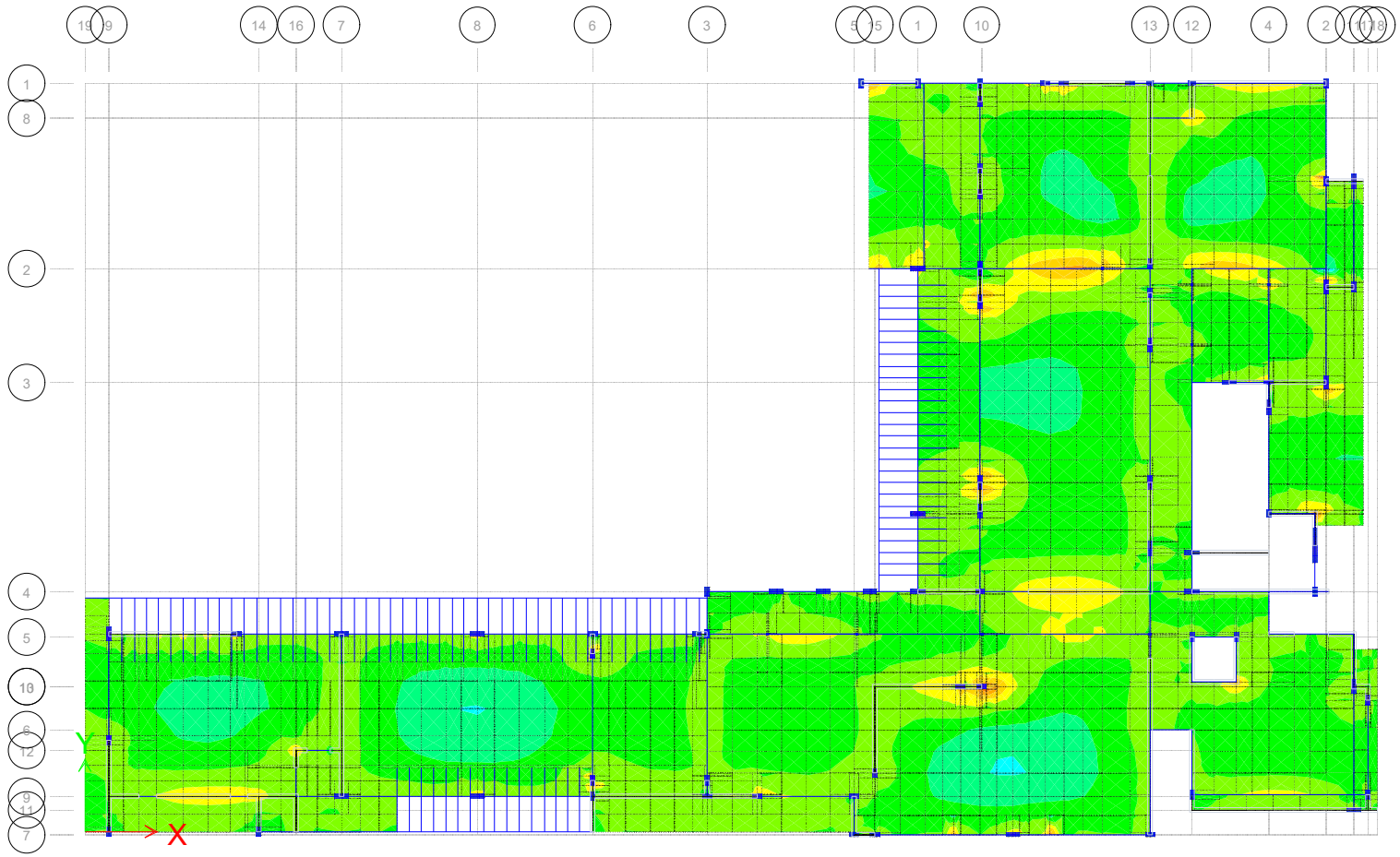
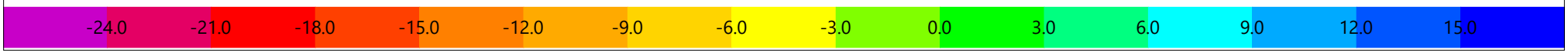
90
120
150
E-3

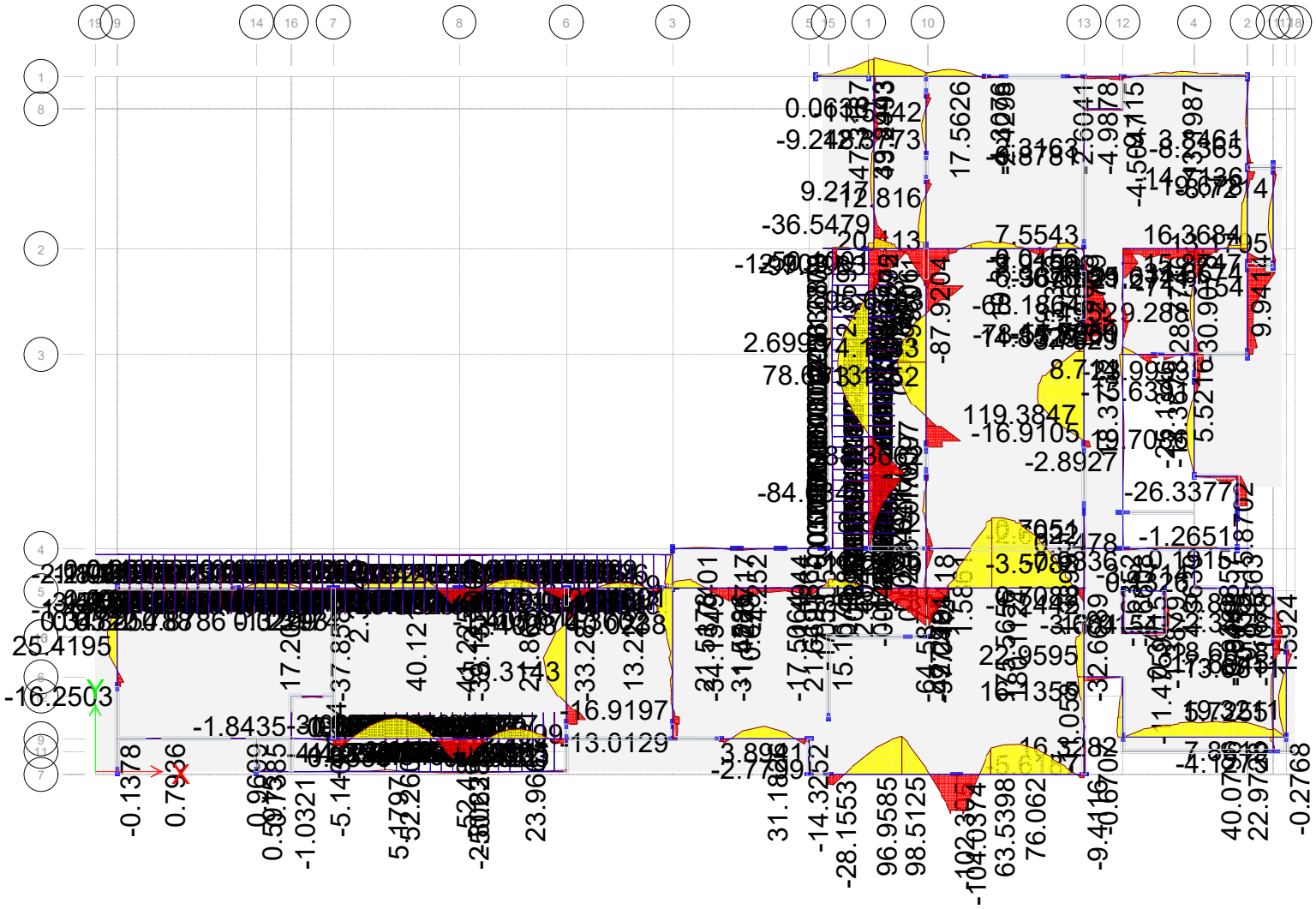


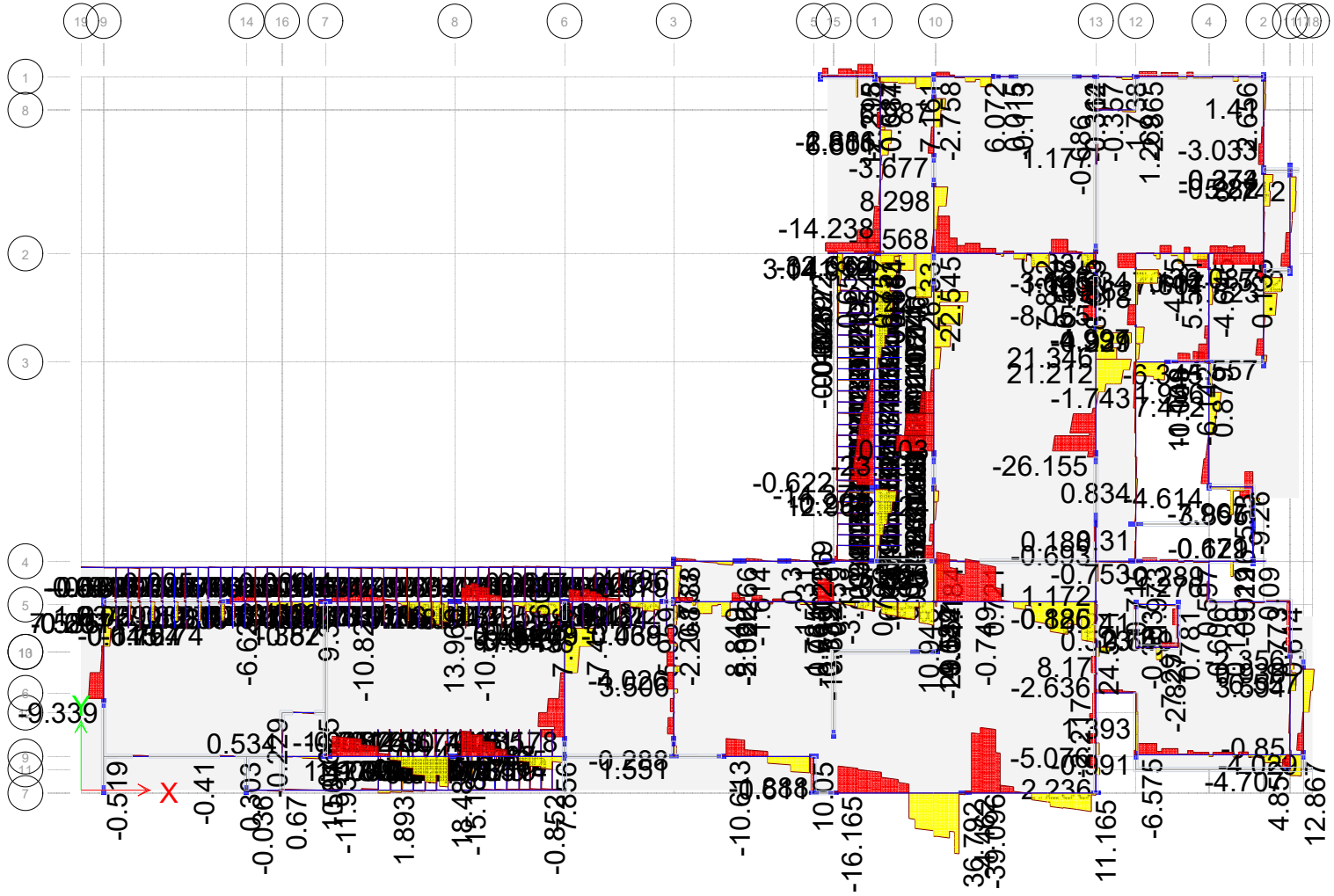
10840 SW 67 ave SECOND FLOOR.FDB Plan View - Story1 - Z = 0 (ft) Resultant M11 Diagram (UDConS2) [kip-ft/ft]

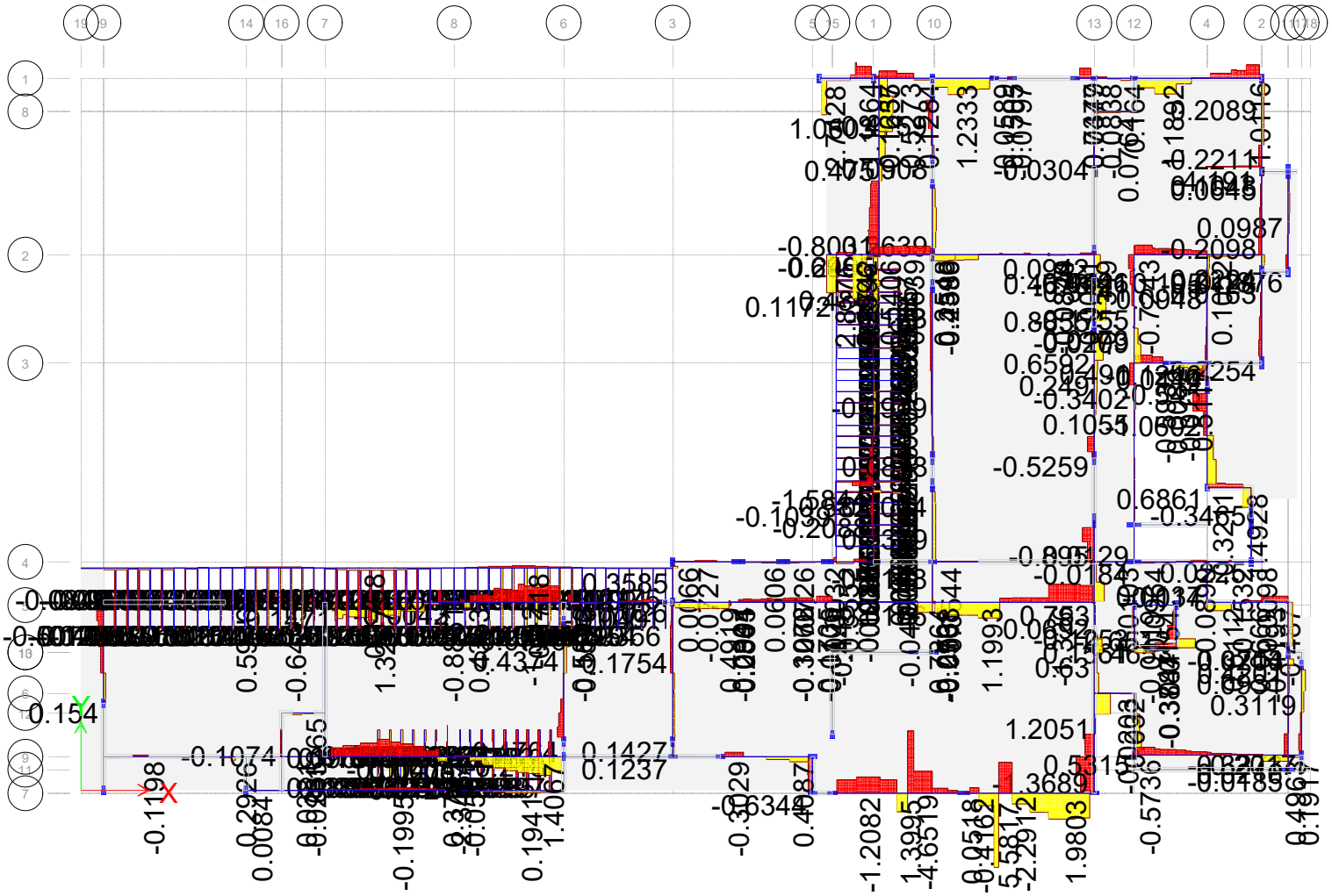


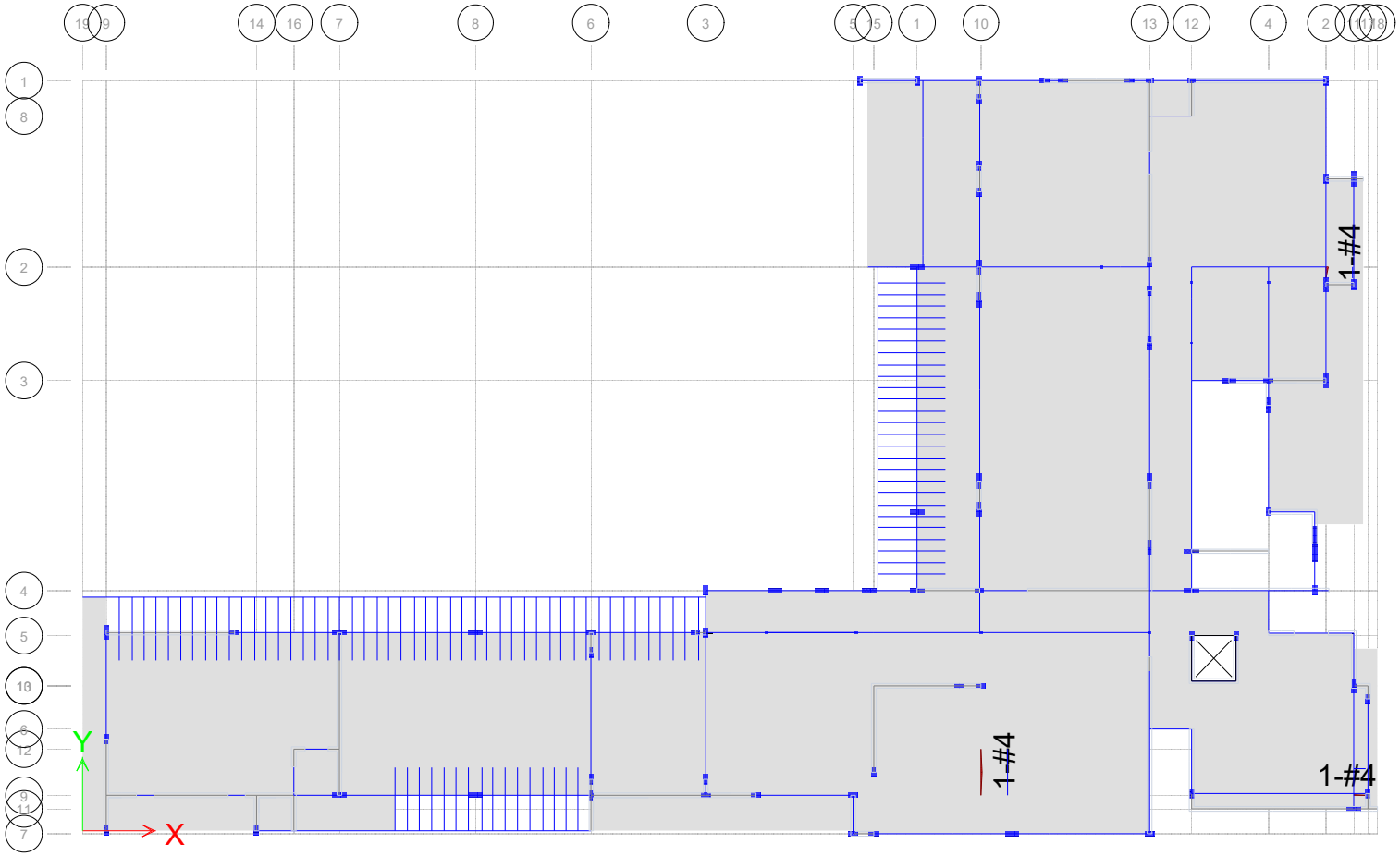


10840 SW 67 ave SECOND FLOOR.FDB Plan View - Story1 - Z = 0 (ft) Resultant M22 Diagram (UDConS2) [kip-ft/ft]

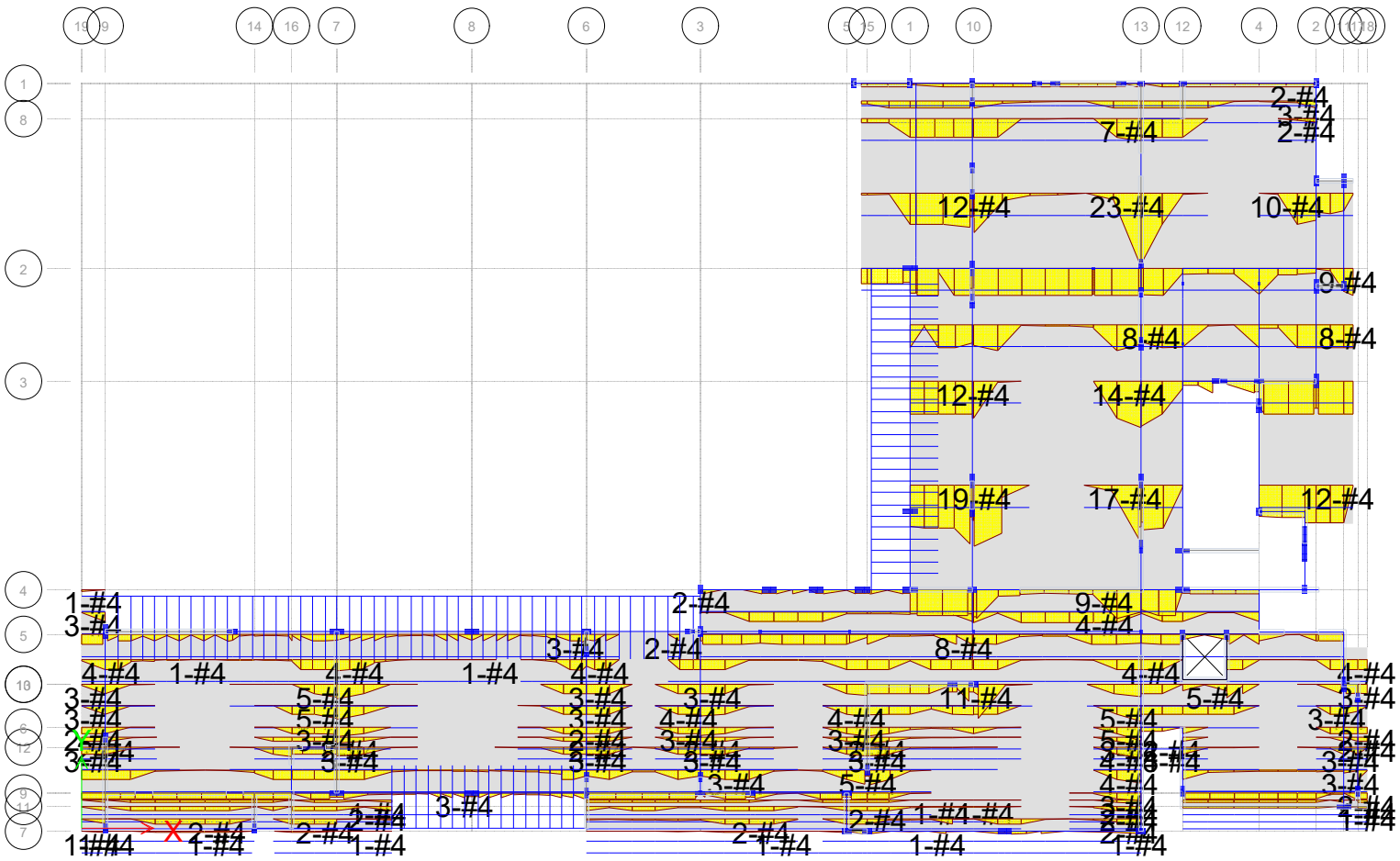








10840 SW 67 Ave - Story - Z = 10 (ft) Slab Strip Design - Layers A, B - Bottom Reinforcement (Enveloping Flexural) - Additional to #4 @ 10 in (Bot)
Plan View - SECOND FLOOR FDB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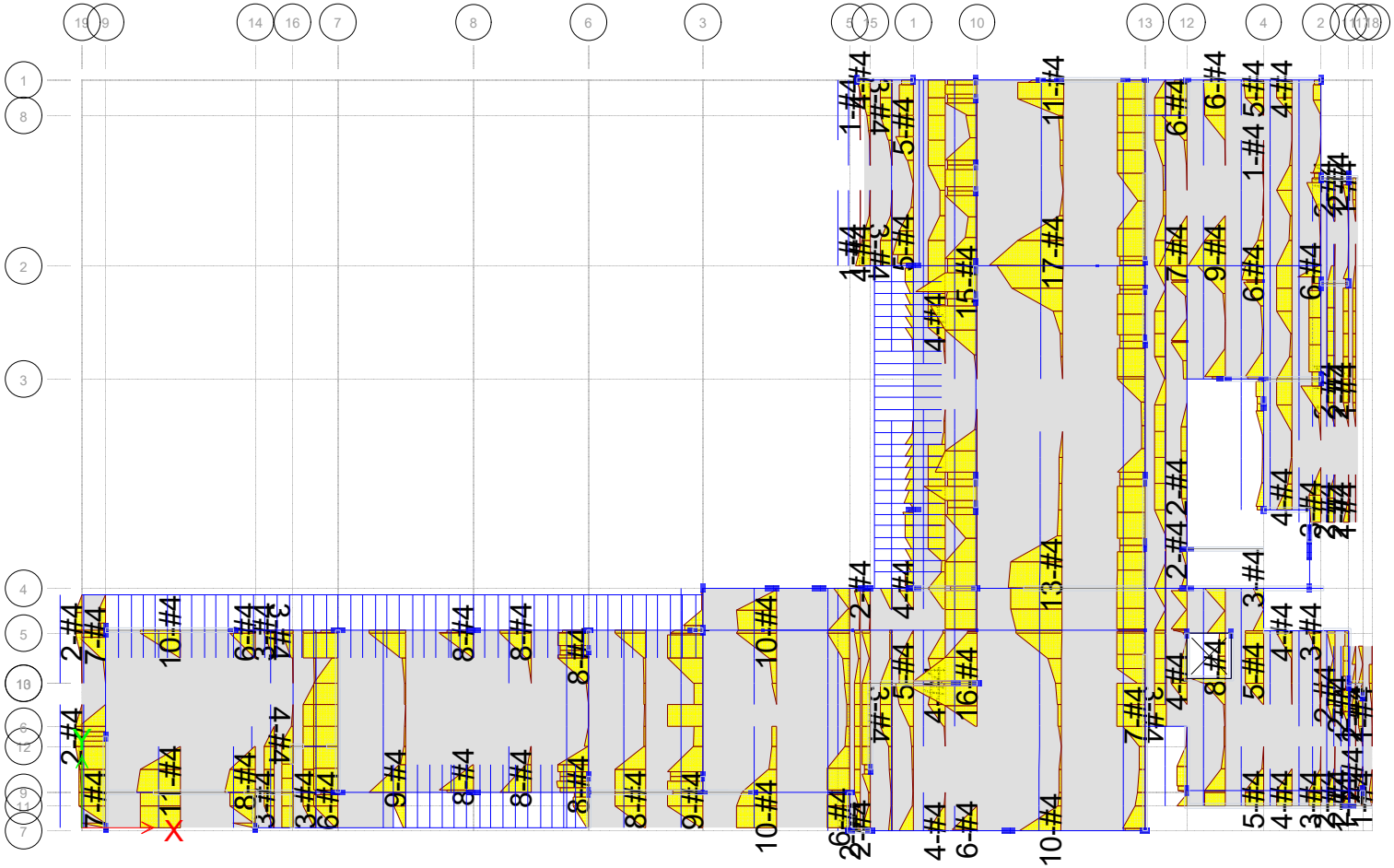
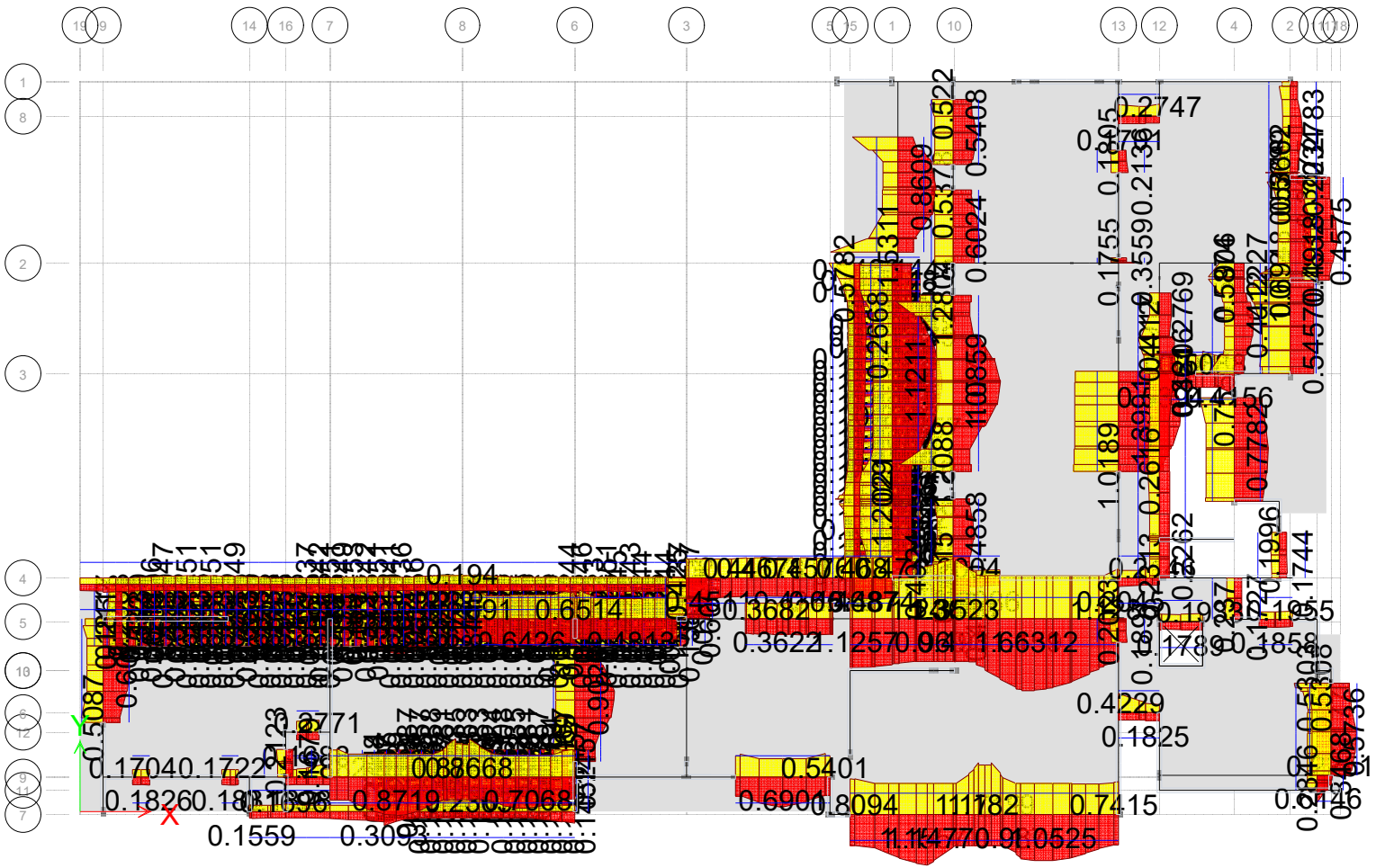
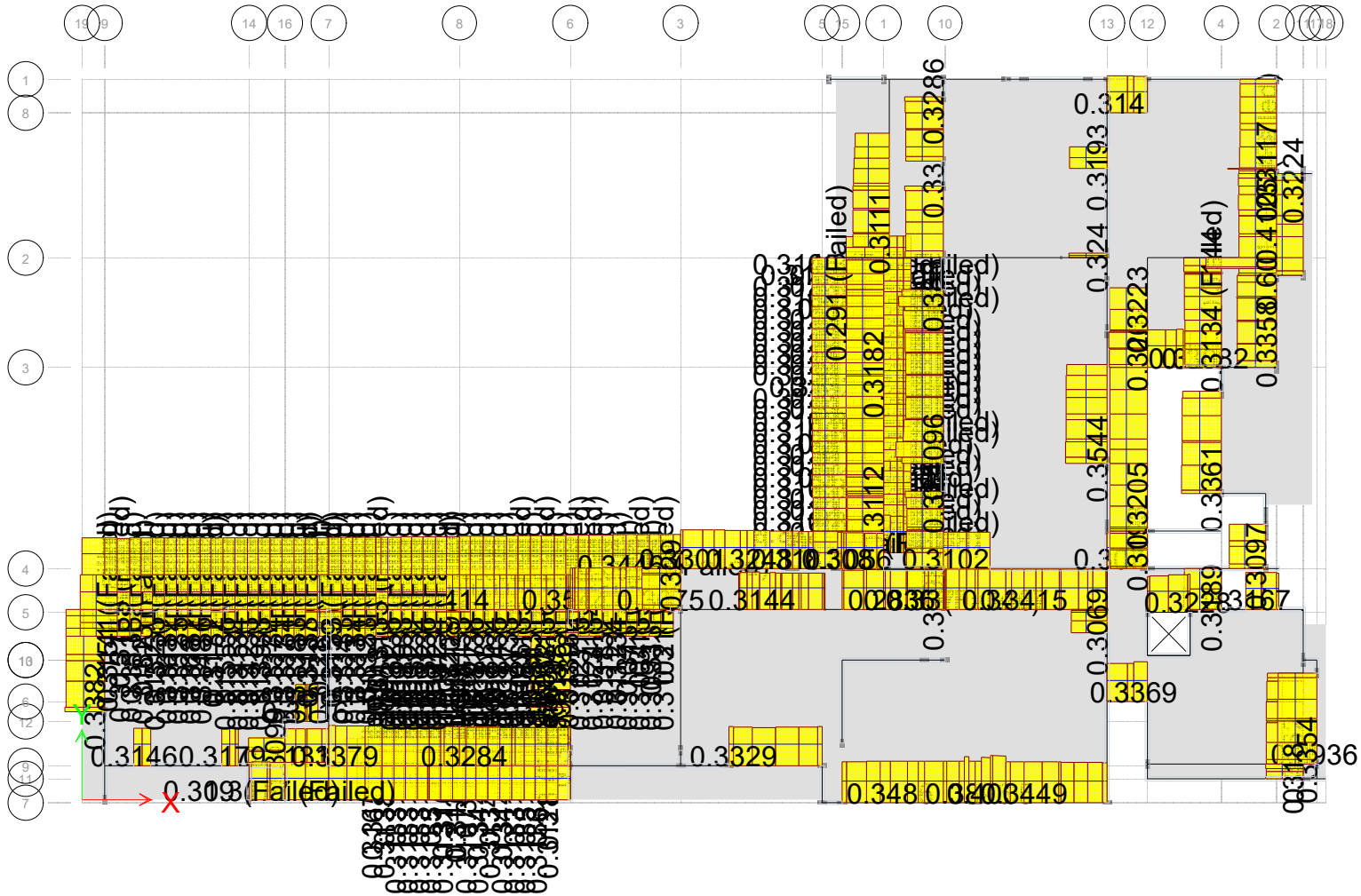


10840 SW 67 Ave - SECOND FLOOR - 0.5 (ft) Slab Strip Design - Layer B - Top Reinforcement (Enveloping Flexural) - Additional to #4 @ 10000000 in (Top)

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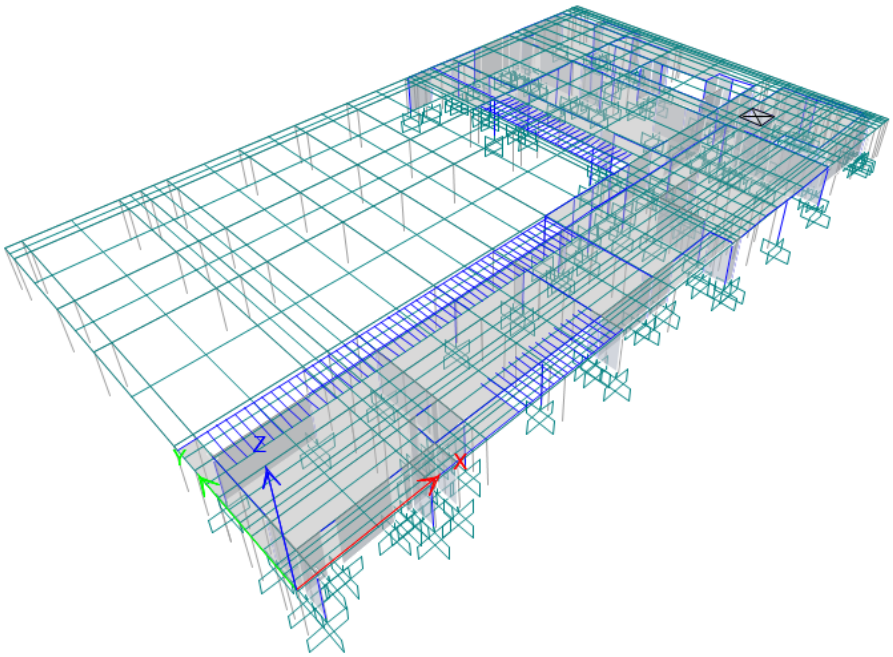

SECOND FLOOR SLAB

10840 SW 67 ave model

Model File: 10840 SW 67 ave SECOND FLOOR, Revision

4/3/2025

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1 Structure Data

This chapter provides model geometry information, including items such as story levels, point coordinates, and element connectivity.

1.1 Grid Data

Table 1.1 - Grid Definitions - General

Name	Type	Ux ft	Uy ft	Rz deg	Datum Name	Story Name Above	Story Name Below	Model Datum ft	Story Height Above ft	Story Height Below ft	Bubble Size in	Color
GLOBAL	Cartesian	0	0	0	Story1		Base	0		11.5	60	10461087

Table 1.2 - Grid Definitions - Grid Lines

Name	Grid Line Type	ID	Ordinate ft	Bubble Location	Visible
GLOBAL	X (Cartesian)	19	0	End	Yes
GLOBAL	X (Cartesian)	9	3.4167	End	Yes
GLOBAL	X (Cartesian)	14	24.8542	End	Yes
GLOBAL	X (Cartesian)	16	30.1875	End	Yes
GLOBAL	X (Cartesian)	7	36.6566	End	Yes
GLOBAL	X (Cartesian)	8	56.0665	End	Yes
GLOBAL	X (Cartesian)	6	72.5938	End	Yes
GLOBAL	X (Cartesian)	3	88.9584	End	Yes
GLOBAL	X (Cartesian)	5	109.9747	End	Yes
GLOBAL	X (Cartesian)	15	112.9392	End	Yes
GLOBAL	X (Cartesian)	1	119.1101	End	Yes
GLOBAL	X (Cartesian)	10	128.1821	End	Yes
GLOBAL	X (Cartesian)	13	152.292	End	Yes
GLOBAL	X (Cartesian)	12	158.2872	End	Yes
GLOBAL	X (Cartesian)	4	169.2247	End	Yes
GLOBAL	X (Cartesian)	2	177.4434	End	Yes
GLOBAL	X (Cartesian)	11	181.4463	End	Yes
GLOBAL	X (Cartesian)	17	183.433	End	Yes
GLOBAL	X (Cartesian)	18	184.7663	End	Yes
GLOBAL	Y (Cartesian)	7	-0.4167	Start	Yes
GLOBAL	Y (Cartesian)	11	3.0938	Start	Yes
GLOBAL	Y (Cartesian)	9	5.0729	Start	Yes
GLOBAL	Y (Cartesian)	12	11.6354	Start	Yes
GLOBAL	Y (Cartesian)	6	14.5625	Start	Yes
GLOBAL	Y (Cartesian)	10	20.7113	Start	Yes
GLOBAL	Y (Cartesian)	13	20.7188	Start	Yes
GLOBAL	Y (Cartesian)	5	27.8312	Start	Yes
GLOBAL	Y (Cartesian)	4	34.3229	Start	Yes
GLOBAL	Y (Cartesian)	3	64.2708	Start	Yes
GLOBAL	Y (Cartesian)	2	80.5052	Start	Yes
GLOBAL	Y (Cartesian)	8	102.0521	Start	Yes
GLOBAL	Y (Cartesian)	1	107.0521	Start	Yes

1.2 Line Connectivity

Table 1.3 - Column Object Connectivity

Unique Name	UniquePtI	UniquePtJ	Length ft
354	969	402	11.5
355	970	515	11.5
356	971	514	11.5
357	972	524	11.5
358	973	463	11.5
359	974	406	11.5
360	975	404	11.5
361	976	372	11.5
362	977	403	11.5
363	978	405	11.5
364	979	525	11.5
365	980	526	11.5
366	981	311	11.5
367	982	312	11.5
368	983	207	11.5
369	984	527	11.5
370	985	310	11.5
371	986	308	11.5
372	987	309	11.5
373	988	528	11.5
374	989	229	11.5
375	990	227	11.5
376	991	226	11.5
377	992	529	11.5
378	993	530	11.5
379	994	211	11.5
380	995	154	11.5
381	996	152	11.5
382	997	208	11.5
383	998	209	11.5
384	999	210	11.5
385	1000	531	11.5
386	1001	190	11.5
387	1002	189	11.5
388	1003	213	11.5
389	1004	192	11.5
390	1005	165	11.5
391	1006	195	11.5
392	1007	148	11.5
393	1008	188	11.5
394	1009	149	11.5
395	1010	166	11.5
396	1011	159	11.5
397	1012	157	11.5

Table 1.3 - Column Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
398	1013	532	11.5
399	1014	144	11.5
400	1015	533	11.5
401	1016	168	11.5
402	1017	534	11.5
403	1018	535	11.5
404	1019	536	11.5
405	1020	171	11.5
406	1021	182	11.5
407	1022	179	11.5
408	1023	181	11.5
409	1024	184	11.5
410	1025	183	11.5
411	1026	186	11.5
412	1027	185	11.5
413	1028	178	11.5
414	1029	193	11.5
415	1030	537	11.5
416	1031	221	11.5
417	1032	220	11.5
418	1033	218	11.5
419	1034	222	11.5
420	1035	196	11.5
421	1036	197	11.5
422	1037	158	11.5
423	1038	143	11.5
424	1039	146	11.5
425	1040	538	11.5
426	1041	162	11.5
427	1042	174	11.5
428	1043	176	11.5
429	1044	180	11.5
430	1045	539	11.5
431	1046	540	11.5
432	1047	206	11.5
433	1048	205	11.5
434	1049	201	11.5
435	1050	198	11.5
436	1051	661	11.5

Table 1.4 - Beam Object Connectivity

Unique Name	UniquePtI	UniquePtJ	Length ft
B1	283	284	5.9951
B2	143	144	9.2808
B3	145	143	8.0379
B4	146	145	0.8475
B5	147	148	8.0379
B6	149	147	0.8475
B7	150	149	5.5736
B8	151	150	1.4577
B9	152	285	1.3137
B10	285	154	5.5736
B11	285	150	46.1823
B12	147	155	1.6075
B13	155	156	16.8982
B14	156	145	8.0412
B15	157	158	9.5327
B16	148	159	10.6657
B17	286	287	3.2532
B18	148	162	17.4226
B19	162	163	2.6327
B20	163	164	4.2413
B21	165	164	3.4356
B22	164	166	0.699
B23	167	168	13.2071
B24	288	167	0.845
B25	170	288	12.4948
B26	171	170	2.5885
B27	172	173	10.9375
B28	173	170	8.2187
B29	174	172	2.2486
B30	175	174	2.1697
B31	176	175	6.4545
B32	177	176	5.3616
B33	178	177	24.3646
B34	179	180	13.9858
B35	180	173	2.2486
B36	181	179	5.619
B37	177	181	5.3185
B38	182	171	13.6458
B39	183	184	15.2188
B40	185	186	6.625
B41	289	188	12.7604
B42	189	289	13.0863
B43	190	191	14.7204
B44	191	192	4.9869
B45	193	178	5.5833

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B46	194	193	5.9951
B47	154	195	11.1667
B48	195	149	35.0156
B49	196	197	6.2918
B50	198	194	6.0313
B51	290	198	3.4896
B52	200	198	14.1962
B53	201	200	9.9137
B54	291	201	0.1866
B55	203	291	2.207
B56	204	203	12.8452
B57	205	204	2.5176
B58	206	205	12.8625
B59	207	206	8.6048
B60	208	152	6.6747
B61	209	208	6.7214
B62	210	209	9.8682
B63	207	210	6.0313
B64	211	292	6.8958
B65	211	213	11.5361
B66	291	211	6.0313
B67	214	215	6.0833
B68	216	217	4.93
B70	218	219	2.2206
B71	220	221	13.4773
B72	222	219	23.1592
B73	219	220	1.9867
B74	223	224	5.9951
B75	225	226	14.3434
B76	227	225	5.2448
B77	228	227	8.4896
B78	229	228	11.2751
B79	293	294	5.5736
B80	294	295	4
B81	296	297	5.5736
B82	297	298	4
B83	299	300	5.5736
B84	300	301	4
B85	302	303	5.5736
B86	303	304	4
B87	305	306	5.5736
B88	306	307	4
B89	313	314	5.5736
B90	314	315	4
B91	316	317	5.5736

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B92	317	318	4
B93	319	320	5.5736
B94	320	321	4
B95	322	323	5.5736
B96	323	324	4
B97	325	326	5.5736
B98	326	327	4
B99	328	329	5.5736
B100	329	330	4
B101	331	332	5.5736
B102	332	333	4
B103	334	335	5.5736
B104	335	336	4
B105	337	338	5.5736
B106	338	339	4
B107	340	341	5.5736
B108	341	342	4
B109	343	344	5.5736
B110	344	345	4
B111	346	347	5.5736
B112	347	348	4
B113	349	350	5.5736
B114	350	351	4
B115	352	353	5.5736
B116	353	354	4
B117	355	356	5.5736
B118	356	357	4
B119	358	359	5.5736
B120	359	360	4
B121	361	362	5.5736
B122	362	363	4
B123	364	365	5.5736
B124	365	366	4
B125	367	368	5.5736
B126	368	369	4
B127	370	371	5.5736
B128	371	373	4
B129	374	375	5.5736
B130	375	376	4
B131	308	309	13.8432
B132	310	207	20.9668
B133	311	312	14.865
B134	377	378	88.9584
B135	379	380	5.1
B136	381	379	4

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B137	382	383	5.1
B138	384	382	4
B139	385	386	5.1
B140	387	385	4
B141	388	389	5.1
B142	390	388	4
B143	391	392	5.1
B144	393	391	4
B145	394	395	5.1
B146	396	394	4
B147	397	398	5.1
B148	399	397	4
B149	400	401	5.1
B150	407	400	4
B151	408	409	5.1
B152	410	408	4
B153	411	412	5.1
B154	413	411	4
B155	414	415	5.1
B156	416	414	4
B157	417	418	5.1
B158	419	417	4
B159	420	421	5.1
B160	422	420	4
B161	423	424	5.1
B162	425	423	4
B163	426	427	5.1
B164	428	426	4
B165	429	430	5.1
B166	431	429	4
B167	432	433	5.1
B168	434	432	4
B169	435	436	5.1
B170	437	435	4
B171	438	439	5.1
B172	440	438	4
B173	372	441	5.1
B174	442	372	4
B175	443	444	5.1
B176	445	443	4
B177	446	447	5.1
B178	448	446	4
B179	449	450	5.1
B180	451	449	4
B181	452	453	5.1

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B182	454	452	4
B183	455	456	5.1
B184	457	455	4
B185	458	459	5.1
B186	460	458	4
B187	461	462	5.1
B188	464	461	4
B189	465	466	5.1
B190	467	465	4
B191	468	469	5.1
B192	470	468	4
B193	402	372	14.9275
B194	372	403	19.4098
B195	403	311	16.5273
B196	404	405	16.5273
B197	406	404	19.4098
B198	403	471	5.1
B199	472	403	4
B200	473	474	5.1
B201	475	473	4
B202	476	477	5.1
B203	478	476	4
B204	479	480	5.1
B205	481	479	4
B206	482	483	5.1
B207	484	482	4
B208	485	486	5.1
B209	487	485	4
B210	488	489	5.1
B211	490	488	4
B212	491	492	5.1
B213	493	491	4
B214	494	495	5.1
B215	496	494	4
B216	497	498	5.1
B217	499	497	4
B218	500	501	5.1
B219	502	500	4
B220	503	504	5.1
B221	505	503	4
B222	506	507	5.1
B223	508	506	4
B224	509	510	5.1
B225	511	509	4
B226	512	513	5.1

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B227	516	512	4
B228	517	518	5.1
B229	519	517	4
B230	520	521	5.1
B231	522	520	4
B232	523	541	5.1
B233	542	523	4
B234	543	544	5.1
B235	545	543	4
B236	463	546	5.3333
B237	546	547	42.4063
B238	548	549	5.0729
B239	549	550	4
B240	551	552	5.0729
B241	552	554	4
B242	555	556	5.0729
B243	556	557	4
B244	558	559	5.0729
B245	559	560	4
B246	562	563	5.0729
B247	563	564	4
B248	565	566	5.0729
B249	566	567	4
B250	568	569	5.0729
B251	569	570	4
B252	571	572	5.0729
B253	572	573	4
B254	574	577	5.0729
B255	577	578	4
B256	579	583	5.0729
B257	583	584	4
B258	585	586	5.0729
B259	586	587	4
B260	590	591	5.0729
B261	591	593	4
B262	594	595	5.0729
B263	595	596	4
B264	598	601	5.0729
B265	601	602	4
B266	603	605	5.0729
B267	605	606	4
B268	607	608	5.0729
B269	608	609	4
B270	514	515	15.2209
B271	610	611	2.5413

Table 1.4 - Beam Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
B272	612	613	2.5
B273	614	615	4.0645
B274	616	617	3.2608
B275	614	406	6.4691
B276	525	526	18.1214
B277	532	533	5.9951
B283	219	553	13.4773
B284	553	537	1.9271
B286	536	535	15.1409
W48-W	538	146	8.1177
W66-W	540	532	2.8679
W67-W	144	539	2.6479
W30-W	533	168	19.1562
W37-W	183	589	6.6354
W38-W	186	589	4.5417
W39-W	215	185	6.6354
W40-W	193	215	10.9375
W63-W	185	604	2
W64-W	184	179	3.5625
W42-W	537	581	7.5208
W61-W	217	581	3.6458
W62-W	214	216	3.6458
W44-W	222	224	9.2481
W17-W	226	223	14.9792
W18-W	223	597	8.2396
W14-W	528	309	5.4896
W53-W	527	310	2.2519
W45-W	599	196	6.4354
W46-W	599	600	6.2918
W47-W	600	197	6.4354
W19-W	194	531	6.1667
W24-W	192	165	7.4372
W16-W	206	664	12.4115
W101-W	664	205	0.451

Table 1.5 - Null Line Object Connectivity

Unique Name	UniquePtI	UniquePtJ	Length ft
WW1	515	402	18.3125
WW2	618	514	7.9979
WW3	618	610	4.25
WW4	611	612	10.5524
WW5	524	618	5.0729
WW6	463	619	5.0729
WW7	619	614	5.3333

Table 1.5 - Null Line Object Connectivity (continued)

Unique Name	UniquePtI	UniquePtJ	Length ft
WW8	546	614	5.0729
WW9	406	620	6.5625
WW10	620	372	16.6563
WW11	405	527	16.3647
WW12	547	405	5.0729
WW13	527	308	7.1731
WW15	529	621	12.3363
WW20	292	194	17.4007
WW21	154	211	8.8854
WW22	531	190	9.4356
WW23	213	189	4.0661
WW25	188	148	4.7333
WW26	166	286	12.5666
WW27	287	283	5.0281
WW28	283	532	5
WW29	284	533	5
WW31	534	535	3.9896
WW33	171	536	3.9896
WW35	179	182	8.2187
WW41	178	622	10.9375
WW43	623	218	23.1592
WW49	539	540	9.5
WW50	615	624	2.498
WW51	624	616	1.6042
WW52	617	620	1.6042
WW54	528	229	2.9645
WW55	623	222	2.2206
WW56	218	625	1.9867
WW57	625	626	1.3333
WW58	625	220	2.2206
WW59	221	627	1.9271
WW60	537	627	1.9867
WW65	535	628	1.3333
WW68	158	143	2.6221
WW69	159	157	3.7264
WW70	597	290	2
WW71	312	207	1.4997
WW72	526	311	2.8454
WW73	613	619	1.5938
WW74	405	525	2.2519
WW99	661	530	3
WW100	621	661	12.243

1.3 Area Connectivity

Table 1.6 - Floor Object Connectivity

Unique Name	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2	Order
F1	145	580	151	147	68.8513	209.16	
F12	147	164	198	207	521.3909	4221.7	1
F12	527	309	528	226			2
F12	223	224	222	219			3
F12	581	214	215	193			4
F12	172	170	168	533			5
F12	666	663	532	145			6
F9	198	164	148	291	153.0202	1268.61	
F4	219	222	623	626	98.8761	127.65	1
F4	629	582					2
F5	534	182	179	183	125.6813	419.51	1
F5	589	588	630	628			2
F6	515	631	377	632	296.8784	2498.67	1
F6	607	608	405	547			2
F6	592	309	527	207			3
F7	211	210	207	291	90.1367	235.44	
F10	211	148	149	154	110.1354	410.35	
F11	170	173	179	182	48.9062	133.43	
F8	173	172	177	179	54.3438	177.56	
ColC402	633	634	635	636	4	0.89	
ColC515	637	638	639	640	5.3333	1.33	
ColC514	641	642	643	644	4	0.89	
ColC524	645	646	647	648	4	0.89	
ColC463	649	650	651	652	4	0.89	
ColC406	653	654	655	656	5.3333	1.33	
ColC404	657	658	659	660	5.3333	1.33	
ColC372	662	665	667	668	5.3333	1.33	
ColC403	669	670	671	672	5.3333	1.33	
ColC405	673	674	675	676	4	0.89	
ColC525	677	678	679	680	4	0.89	
ColC526	681	682	683	684	4	0.89	
ColC311	685	686	687	688	4	0.89	
ColC312	689	690	691	692	4	0.89	
ColC207	693	694	695	696	4	0.89	
ColC527	697	698	699	700	4	0.89	
ColC310	701	702	703	704	4	0.89	
ColC308	705	706	707	708	4	0.89	
ColC309	709	710	711	712	4	0.89	
ColC528	713	714	715	716	4	0.89	
ColC229	717	718	719	720	4	0.89	
ColC227	721	722	723	724	5	1.22	
ColC226	725	726	727	728	4	0.89	
ColC529	729	730	731	732	4	0.89	
ColC530	733	734	735	736	4	0.89	

Table 1.6 - Floor Object Connectivity (continued)

Unique Name	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2	Order
ColC211	737	738	739	740	4	0.89	
ColC154	741	742	743	744	5.3333	1.33	
ColC152	745	746	747	748	5.3333	1.33	
ColC208	749	750	751	752	5.3333	1.33	
ColC209	753	754	755	756	5.3333	1.33	
ColC210	757	758	759	760	4	0.89	
ColC531	761	762	763	764	5.3333	1.33	
ColC190	765	766	767	768	5.3333	1.33	
ColC189	769	770	771	772	5.3333	1.33	
ColC213	773	774	775	776	5.3333	1.33	
ColC192	777	778	779	780	5.3333	1.33	
ColC165	781	782	783	784	4	0.89	
ColC195	785	786	787	788	5.3333	1.33	
ColC148	789	790	791	792	5.3333	1.33	
ColC188	793	794	795	796	5.3333	1.33	
ColC149	797	798	799	800	5.3333	1.33	
ColC166	801	802	803	804	4	0.89	
ColC159	805	806	807	808	4	0.89	
ColC157	809	810	811	812	4	0.89	
ColC532	813	814	815	816	3.3333	0.67	
ColC144	817	818	819	820	4	0.89	
ColC533	821	822	823	824	3.3333	0.67	
ColC168	825	826	827	828	4	0.89	
ColC534	829	830	831	832	4	0.89	
ColC535	833	834	835	836	5.3333	1.33	
ColC536	837	838	839	840	4	0.89	
ColC171	841	842	843	844	5.3333	1.33	
ColC182	845	846	847	848	5.3333	1.33	
ColC179	849	850	851	852	4	0.89	
ColC181	853	854	855	856	5.3333	1.33	
ColC184	857	858	859	860	5.3333	1.33	
ColC183	861	862	863	864	3.3333	0.67	
ColC186	865	866	867	868	11.3333	3.33	
ColC185	869	870	871	872	4	0.89	
ColC178	873	874	875	876	5.3333	1.33	
ColC193	877	878	879	880	5.3333	1.33	
ColC537	881	882	883	884	5.3333	1.33	
ColC221	885	886	887	888	4	0.89	
ColC220	889	890	891	892	4	0.89	
ColC218	893	894	895	896	5.3333	1.33	
ColC222	897	898	899	900	4	0.89	
ColC196	901	902	903	904	4	0.89	
ColC197	905	906	907	908	4	0.89	
ColC158	909	910	911	912	4	0.89	
ColC143	913	914	915	916	4	0.89	

Table 1.6 - Floor Object Connectivity (continued)

Unique Name	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2	Order
ColC146	917	918	919	920	4	0.89	
ColC538	921	922	923	924	4	0.89	
ColC162	925	926	927	928	1.3333	0.11	
ColC174	929	930	931	932	1.3333	0.11	
ColC176	933	934	935	936	1.3333	0.11	
ColC180	937	938	939	940	1.3333	0.11	
ColC539	941	942	943	944	4	0.89	
ColC540	945	946	947	948	4	0.89	
ColC206	949	950	951	952	1.3333	0.11	
ColC205	953	954	955	956	1.3333	0.11	
ColC201	957	958	959	960	1.3333	0.11	
ColC198	961	962	963	964	1.3333	0.11	
ColC661	965	966	967	968	4	0.89	

Table 1.7 - Wall Object Connectivity

UniqueName	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2
95	970	969	402	515	59.625	210.59
96	1052	971	514	618	38.9958	91.98
97	1052	1053	610	618	31.5	48.88
98	1054	1055	612	611	44.1048	121.35
99	972	1052	618	524	33.1458	58.34
100	973	1056	619	463	33.1458	58.34
101	1056	1057	614	619	33.6667	61.33
102	1058	1057	614	546	33.1458	58.34
103	974	1059	620	406	36.125	75.47
104	1059	976	372	620	56.3125	191.55
105	978	984	527	405	55.7293	188.19
106	1060	978	405	547	33.1458	58.34
107	984	986	308	527	37.3462	82.49
108	988	987	309	528	33.9792	63.13
109	992	1061	621	529	47.6725	141.87
110	991	1062	223	226	52.9583	172.26
111	1062	1063	597	223	39.4792	94.76
112	1064	1000	531	194	35.3333	70.92
113	1065	1064	194	292	57.8014	200.11
114	995	994	211	154	40.7708	102.18
115	1000	1001	190	531	41.8712	108.51
116	1003	1002	189	213	31.1323	46.76
117	1004	1005	165	192	37.8743	85.53
118	1008	1007	148	188	32.4666	54.43
119	1010	1066	286	166	48.1332	144.52
120	1067	1068	283	287	33.0562	57.82
121	1068	1013	532	283	33	57.5
122	1069	1015	533	284	33	57.5

Table 1.7 - Wall Object Connectivity (continued)

UniqueName	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2
123	1015	1016	168	533	61.3125	220.3
124	1017	1018	535	534	30.9792	45.88
125	1020	1019	536	171	30.9792	45.88
126	1022	1021	182	179	39.4375	94.52
127	1023	1022	179	181	34.238	64.62
128	1025	1070	589	183	36.2708	76.31
129	1026	1070	589	186	32.0833	52.23
130	1071	1027	185	215	36.2708	76.31
131	1029	1071	215	193	44.875	125.78
132	1028	1072	622	178	44.875	125.78
133	1030	1073	581	537	38.0417	86.49
134	1074	1033	218	623	69.3183	266.33
135	1034	1075	224	222	41.4963	106.35
136	1076	1035	196	599	35.8708	74.01
137	1076	1077	600	599	35.5835	72.36
138	1077	1036	197	600	35.8708	74.01
139	1040	1039	146	538	39.2355	93.35
140	1045	1046	540	539	42.0001	109.25
141	1078	1079	624	615	27.9959	28.73
142	1079	1080	616	624	26.2083	18.45
143	1081	1059	620	617	26.2083	18.45
144	984	985	310	527	27.5038	25.9
145	988	989	229	528	28.929	34.09
146	1074	1034	222	623	27.4412	25.54
147	1033	1082	625	218	26.9734	22.85
148	1082	1083	626	625	25.6667	15.33
149	1082	1032	220	625	27.4412	25.54
150	1031	1084	627	221	26.8542	22.16
151	1030	1084	627	537	26.9734	22.85
152	1085	1073	581	217	30.2917	41.93
153	1086	1087	216	214	30.2917	41.93
154	1027	1088	604	185	27	23
155	1024	1022	179	184	30.125	40.97
156	1018	1089	628	535	25.6667	15.33
157	1046	1013	532	540	28.7357	32.98
158	1014	1045	539	144	28.2957	30.45
159	1037	1038	143	158	28.2442	30.15
160	1011	1012	157	159	30.4528	42.85
161	1063	1090	290	597	27	23
162	982	983	207	312	25.9993	17.25
163	980	981	311	526	28.6909	32.72
164	1091	1056	619	613	26.1875	18.33
165	978	979	525	405	27.5038	25.9
166	1051	993	530	661	29	34.5
167	1061	1051	661	621	47.4859	140.79

Table 1.8 - Null Area Object Connectivity

Unique Name	UniquePt1	UniquePt2	UniquePt3	UniquePt4	Perimeter ft	Area ft2
A2	197	196	599	600	25.4543	40.49

1.4 Strip Connectivity

Table 1.9 - Strip Object Connectivity

Name	Number Segments	Strip Start Point	Segment End Point	Start Width Left ft	Start Width Right ft	End Width Left ft	End Width Right ft	Auto Widen	Layer
CSA10	1	19	20	1.6229	7.487	1.6229	7.487	Yes	A
CSA11	1	21	22	1.7781	1.6229	1.7781	1.6229	Yes	A
CSA12	1	23	24	1.5372	1.7819	1.5372	1.7819	Yes	A
CSA13	1	25	26	0.7318	1.5372	0.7318	1.5372	Yes	A
CSA14	1	27	28	1.6406	0.7318	1.6406	0.7318	Yes	A
CSA15	1	29	30	0.4948	1.6406	0.4948	1.6406	Yes	A
CSA16	1	626	31	0.8776	0.4948	0.8776	0.4948	Yes	A
CSA17	1	32	33	0	0.8776	0	0.8776	Yes	A
CSA5	1	9	10	1.25	0	1.25	0	Yes	A
CSA7	1	13	14	5.3867	1.25	5.3867	1.25	Yes	A
CSA8	1	15	16	4.0586	5.3867	4.0586	5.3867	Yes	A
CSA9	1	17	18	7.487	4.0586	7.487	4.0586	Yes	A
CSB1	1	33	10	0	1.7083	0	1.7083	Yes	B
CSB10	1	70	71	4.0912	5.2541	4.0912	5.2541	Yes	B
CSB11	1	528	72	5.2541	0.7411	5.2541	0.7411	Yes	B
CSB12	1	229	73	0.7411	1.5427	0.7411	1.5395	Yes	B
CSB13	1	74	146	1.5427	2.268	1.5459	2.268	Yes	B
CSB14	1	75	76	2.268	6.0278	2.268	6.2043	Yes	B
CSB15	1	226	532	6.0275	1.4988	5.8506	1.4647	Yes	B
CSB16	1	77	533	1.4988	2.7344	1.5329	2.7344	Yes	B
CSB17	1	78	79	2.7344	2.0547	2.7344	2.0547	Yes	B
CSB18	1	80	168	2.0547	1.0007	2.0547	1.0007	Yes	B
CSB19	1	81	82	1.0007	0.4967	1.0007	0.4967	Yes	B
CSB2	1	32	9	0.6667	0	0.6667	0	Yes	B
CSB20	1	83	84	0.4967	0.6667	0.4967	0.6667	Yes	B
CSB3	1	56	57	1.7083	5.3594	1.7083	5.3594	Yes	B
CSB4	1	58	59	5.3594	1.3333	5.3594	1.3333	Yes	B
CSB5	1	60	61	1.3437	1.6069	1.3333	1.6173	Yes	B
CSB6	1	62	63	1.6173	4.8525	1.6173	4.8525	Yes	B
CSB7	1	64	65	4.8525	4.1318	4.8525	4.1318	Yes	B
CSB9	1	68	69	4.1318	4.0912	4.1318	4.0912	Yes	B
MSA1	1	34	35	0.8776	0.8776	0.8776	0.8776	Yes	A
MSA10	1	52	53	5.3867	5.3867	5.3867	5.3867	Yes	A
MSA11	1	54	55	1.25	1.25	1.25	1.25	Yes	A
MSA2	1	36	37	0.4948	0.4948	0.4948	0.4948	Yes	A
MSA3	1	38	39	1.6406	1.6406	1.6406	1.6406	Yes	A
MSA4	1	40	41	0.7318	0.7318	0.7318	0.7318	Yes	A

Table 1.9 - Strip Object Connectivity (continued)

Name	Number Segments	Strip Start Point	Segment End Point	Start Width Left ft	Start Width Right ft	End Width Left ft	End Width Right ft	Auto Widen	Layer
MSA5	1	42	43	1.5372	1.5372	1.5372	1.5372	Yes	A
MSA6	1	44	45	1.7819	1.7781	1.7819	1.7781	Yes	A
MSA7	1	46	47	1.6229	1.6229	1.6229	1.6229	Yes	A
MSA8	1	48	49	7.487	7.487	7.487	7.487	Yes	A
MSA9	1	50	51	4.0586	4.0586	4.0586	4.0586	Yes	A
MSB1	1	85	86	0.4967	0.4967	0.4967	0.4967	Yes	B
MSB10	1	103	104	5.2541	5.2541	5.2541	5.2541	Yes	B
MSB11	1	105	106	4.0912	4.0912	4.0912	4.0912	Yes	B
MSB12	1	107	108	4.1318	4.1318	4.1318	4.1318	Yes	B
MSB13	1	109	110	4.8525	4.8525	4.8525	4.8525	Yes	B
MSB14	1	111	112	1.6069	1.6173	1.6173	1.6173	Yes	B
MSB15	1	113	114	1.3333	1.3437	1.3333	1.3333	Yes	B
MSB16	1	115	116	5.3594	5.3594	5.3594	5.3594	Yes	B
MSB2	1	87	88	1.0007	1.0007	1.0007	1.0007	Yes	B
MSB3	1	89	90	2.0547	2.0547	2.0547	2.0547	Yes	B
MSB4	1	91	92	2.7344	2.7344	2.7344	2.7344	Yes	B
MSB5	1	93	94	1.4988	1.4988	1.4647	1.5329	Yes	B
MSB6	1	95	96	6.0275	6.0275	6.2044	5.8507	Yes	B
MSB7	1	97	98	2.268	2.268	2.268	2.268	Yes	B
MSB8	1	99	100	1.5427	1.5427	1.5395	1.5459	Yes	B
MSB9	1	101	102	0.7411	0.7411	0.7411	0.7411	Yes	B

1.5 Mass

Table 1.10 - Mass Source Definition

Name	Is Default	Include Lateral Mass?	Include Vertical Mass?	Lump Mass?	Source Self Mass?	Source Added Mass?	Source Load Patterns?	Move Mass Centroid?
MsSrc1	Yes	No	Yes	Yes	Yes	Yes	No	No

Table 1.11 - Mass Summary by Group

Group	Self Mass lb-s2/ft	Self Weight kip	Mass X lb-s2/ft	Mass Y lb-s2/ft	Mass Z lb-s2/ft
ALL	71530.84	0	71530.84	71530.84	71530.84

2 Properties

This chapter provides property information for materials, frame sections, shell sections, and links.

2.1 Materials

Table 2.1 - Material Properties - General

Material	Type	SymType	Grade	Color	Notes
A416Gr270	Tendon	Uniaxial	Unknown	Magenta	ASTM A416 Grade 270 added 4/3/2025 8:18:18 PM
A615Gr60	Rebar	Uniaxial	Unknown	Cyan	ASTM A615 Grade 60 added 4/3/2025 8:18:18 PM
MAT1	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 8:18:18 PM
MAT2	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 8:18:18 PM
MAT3	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 8:18:18 PM
MAT4	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 8:18:18 PM
MAT5	Concrete	Isotropic	Unknown	Blue	Normalweight f'c = 4 ksi added 4/3/2025 8:18:18 PM

2.2 Frame Sections

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 3)

Name	Material	Shape	Color	Area in2	J in4	I33 in4	I22 in4	I23 in4	As2 in2	As3 in2
2B-1	MAT1	Concrete Rectangular	Blue	240	4265.95	18000	1280	0	200	200
2B-10	MAT1	Concrete Rectangular	Yellow	240	4265.95	18000	1280	0	200	200
2B-11	MAT1	Concrete Rectangular	Gray8Dark	240	4265.95	18000	1280	0	200	200
2B-12	MAT1	Concrete Rectangular	Blue	544	10759.81	209621.33	2901.33	0	453.33	453.33
2B-14	MAT1	Concrete Rectangular	Green	216	3753.64	13122	1152	0	180	180
2B-15	MAT1	Concrete Rectangular	Cyan	544	10759.81	209621.33	2901.33	0	453.33	453.33
2B-16	MAT1	Concrete Rectangular	Red	96	1205.11	1152	512	0	80	80
2B-17	MAT1	Concrete Rectangular	Magenta	160	2557.9	5333.33	853.33	0	133.33	133.33
2B-18	MAT1	Concrete Rectangular	Yellow	160	2557.9	5333.33	853.33	0	133.33	133.33
2B-19	MAT1	Concrete Rectangular	Cyan	304	5632.78	36581.33	1621.33	0	253.33	253.33
2B-2	MAT1	Concrete Rectangular	Green	208	3582.29	11717.33	1109.33	0	173.33	173.33
2B-21	MAT1	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67	106.67
2B-22	MAT1	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
2B-23	MAT1	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160	160
2B-24	MAT1	Concrete Rectangular	Blue	360	6829.05	60750	1920	0	300	300
2B-25	MAT1	Concrete Rectangular	Green	240	4265.95	18000	1280	0	200	200
2B-26	MAT1	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
2B-29	MAT1	Concrete Rectangular	Green	240	4265.95	18000	1280	0	200	200
2B-3	MAT1	Concrete Rectangular	Cyan	288	5291.19	31104	1536	0	240	240
2B-30	MAT1	Concrete Rectangular	Cyan	240	4265.95	18000	1280	0	200	200
2B-34	MAT1	Concrete Rectangular	Gray8Dark	252	6722.69	2315.25	12096	0	210	210
2B-35	MAT1	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
2B-36	MAT1	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
2B-37	MAT1	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
2B-38	MAT1	Concrete Rectangular	Red	256	4608.18	21845.33	1365.33	0	213.33	213.33
2B-39	MAT1	Concrete Rectangular	Blue	80	881.1	666.67	426.67	0	66.67	66.67
2B-4	MAT1	Concrete Rectangular	Red	288	5291.19	31104	1536	0	240	240
2B-40	MAT1	Concrete Rectangular	Green	192	3240.89	9216	1024	0	160	160

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 3, continued)

Name	Material	Shape	Color	Area in2	J in4	I33 in4	I22 in4	I23 in4	As2 in2	As3 in2
2B-5	MAT1	Concrete Rectangular	Magenta	240	4265.95	18000	1280	0	200	200
2B-6	MAT1	Concrete Rectangular	Yellow	240	4265.95	18000	1280	0	200	200
2B-8	MAT1	Concrete Rectangular	Red	240	4265.95	18000	1280	0	200	200
2B-9	MAT1	Concrete Rectangular	Magenta	384	7341.5	73728	2048	0	320	320
C143	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C144	MAT4	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67	106.67
C146	MAT4	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67	106.67
C148	MAT4	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
C149	MAT4	Concrete Rectangular	Cyan	192	3240.89	9216	1024	0	160	160
C152	MAT4	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
C154	MAT4	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160	160
C157	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C158	MAT4	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67	106.67
C159	MAT4	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67	106.67
C162	MAT5	Concrete Rectangular	Green	16	36.07	21.33	21.33	0	13.33	13.33
C165	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C166	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C168	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C171	MAT4	Concrete Rectangular	Cyan	192	3240.89	9216	1024	0	160	160
C174	MAT5	Concrete Rectangular	Cyan	16	36.07	21.33	21.33	0	13.33	13.33
C176	MAT5	Concrete Rectangular	Red	16	36.07	21.33	21.33	0	13.33	13.33
C178	MAT4	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160	160
C179	MAT4	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67	106.67
C180	MAT5	Concrete Rectangular	Magenta	16	36.07	21.33	21.33	0	13.33	13.33
C181	MAT4	Concrete Rectangular	Yellow	192	3240.89	9216	1024	0	160	160
C182	MAT4	Concrete Rectangular	Red	192	3240.89	9216	1024	0	160	160
C183	MAT4	Concrete Rectangular	Red	96	1205.11	1152	512	0	80	80
C184	MAT4	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160	160
C185	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C186	MAT4	Concrete Rectangular	Magenta	480	9391.99	144000	2560	0	400	400
C188	MAT4	Concrete Rectangular	Green	192	3240.89	9216	1024	0	160	160
C189	MAT4	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160	160
C190	MAT4	Concrete Rectangular	Yellow	192	3240.89	9216	1024	0	160	160
C192	MAT4	Concrete Rectangular	Green	192	3240.89	9216	1024	0	160	160
C193	MAT4	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
C195	MAT4	Concrete Rectangular	Gray8Dark	192	3240.89	9216	1024	0	160	160
C196	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C197	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C198	MAT5	Concrete Rectangular	Gray8Dark	16	36.07	21.33	21.33	0	13.33	13.33
C201	MAT5	Concrete Rectangular	Yellow	16	36.07	21.33	21.33	0	13.33	13.33
C205	MAT5	Concrete Rectangular	Magenta	16	36.07	21.33	21.33	0	13.33	13.33
C206	MAT5	Concrete Rectangular	Red	16	36.07	21.33	21.33	0	13.33	13.33
C207	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C208	MAT4	Concrete Rectangular	Green	192	3240.89	9216	1024	0	160	160
C209	MAT4	Concrete Rectangular	Cyan	192	3240.89	9216	1024	0	160	160

Table 2.2 - Frame Section Property Definitions - Summary (Part 1 of 3, continued)

Name	Material	Shape	Color	Area in2	J in4	I33 in4	I22 in4	I23 in4	As2 in2	As3 in2
C210	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C211	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C213	MAT4	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
C218	MAT4	Concrete Rectangular	Magenta	192	3240.89	9216	1024	0	160	160
C220	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C221	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C222	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C226	MAT4	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67	106.67
C227	MAT4	Concrete Rectangular	Yellow	176	2899.04	7098.67	938.67	0	146.67	146.67
C229	MAT4	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67	106.67
C308	MAT4	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
C309	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C310	MAT4	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67	106.67
C311	MAT4	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67	106.67
C312	MAT4	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
C372	MAT4	Concrete Rectangular	Cyan	192	3240.89	9216	1024	0	160	160
C402	MAT4	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67	106.67
C403	MAT4	Concrete Rectangular	Red	192	3240.89	9216	1024	0	160	160
C404	MAT4	Concrete Rectangular	Green	192	3240.89	9216	1024	0	160	160
C405	MAT4	Concrete Rectangular	Magenta	128	1876.67	2730.67	682.67	0	106.67	106.67
C406	MAT4	Concrete Rectangular	Magenta	192	3240.89	9216	1024	0	160	160
C463	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C514	MAT4	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
C515	MAT4	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
C524	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C525	MAT4	Concrete Rectangular	Yellow	128	1876.67	2730.67	682.67	0	106.67	106.67
C526	MAT4	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67	106.67
C527	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C528	MAT4	Concrete Rectangular	Red	128	1876.67	2730.67	682.67	0	106.67	106.67
C529	MAT4	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67	106.67
C530	MAT4	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
C531	MAT4	Concrete Rectangular	Magenta	192	3240.89	9216	1024	0	160	160
C532	MAT4	Concrete Rectangular	Gray8Dark	96	1205.11	1152	512	0	80	80
C533	MAT4	Concrete Rectangular	Magenta	96	1205.11	1152	512	0	80	80
C534	MAT4	Concrete Rectangular	Gray8Dark	128	1876.67	2730.67	682.67	0	106.67	106.67
C535	MAT4	Concrete Rectangular	Blue	192	3240.89	9216	1024	0	160	160
C536	MAT4	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
C537	MAT4	Concrete Rectangular	Green	192	3240.89	9216	1024	0	160	160
C538	MAT4	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67	106.67
C539	MAT4	Concrete Rectangular	Green	128	1876.67	2730.67	682.67	0	106.67	106.67
C540	MAT4	Concrete Rectangular	Cyan	128	1876.67	2730.67	682.67	0	106.67	106.67
C661	MAT4	Concrete Rectangular	Blue	128	1876.67	2730.67	682.67	0	106.67	106.67
CMU-W	MAT2	Concrete Rectangular	Red	1104	22720.93	1752048	5888	0	920	920
TB-1	MAT1	Concrete Rectangular	Gray8Dark	96	1205.11	1152	512	0	80	80
TRELLIS	MAT1	Concrete Rectangular	Cyan	80	881.1	666.67	426.67	0	66.67	66.67

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 3)

Name	S33Pos in3	S33Neg in3	S22Pos in3	S22Neg in3	Z33 in3	Z22 in3	R33 in	R22 in	CG Offset 3 in	CG Offset 2 in	PNA Offset 3 in	PNA Offset 2 in
2B-1	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-10	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-11	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-12	6165.33	6165.33	725.33	725.33	9248	1088	19.6299	2.3094	0	0	0	0
2B-14	972	972	288	288	1458	432	7.7942	2.3094	0	0	0	0
2B-15	6165.33	6165.33	725.33	725.33	9248	1088	19.6299	2.3094	0	0	0	0
2B-16	192	192	128	128	288	192	3.4641	2.3094	0	0	0	0
2B-17	533.33	533.33	213.33	213.33	800	320	5.7735	2.3094	0	0	0	0
2B-18	533.33	533.33	213.33	213.33	800	320	5.7735	2.3094	0	0	0	0
2B-19	1925.33	1925.33	405.33	405.33	2888	608	10.9697	2.3094	0	0	0	0
2B-2	901.33	901.33	277.33	277.33	1352	416	7.5056	2.3094	0	0	0	0
2B-21	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
2B-22	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
2B-23	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
2B-24	2700	2700	480	480	4050	720	12.9904	2.3094	0	0	0	0
2B-25	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-26	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
2B-29	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-3	1728	1728	384	384	2592	576	10.3923	2.3094	0	0	0	0
2B-30	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-34	441	441	1008	1008	661.5	1512	3.0311	6.9282	0	0	0	0
2B-35	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
2B-36	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
2B-37	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
2B-38	1365.33	1365.33	341.33	341.33	2048	512	9.2376	2.3094	0	0	0	0
2B-39	133.33	133.33	106.67	106.67	200	160	2.8868	2.3094	0	0	0	0
2B-4	1728	1728	384	384	2592	576	10.3923	2.3094	0	0	0	0
2B-40	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
2B-5	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-6	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-8	1200	1200	320	320	1800	480	8.6603	2.3094	0	0	0	0
2B-9	3072	3072	512	512	4608	768	13.8564	2.3094	0	0	0	0
C143	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C144	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C146	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C148	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C149	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C152	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C154	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C157	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C158	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C159	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C162	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C165	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 3, continued)

Name	S33Pos in3	S33Neg in3	S22Pos in3	S22Neg in3	Z33 in3	Z22 in3	R33 in	R22 in	CG Offset 3 in	CG Offset 2 in	PNA Offset 3 in	PNA Offset 2 in
C166	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C168	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C171	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C174	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C176	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C178	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C179	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C180	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C181	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C182	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C183	192	192	128	128	288	192	3.4641	2.3094	0	0	0	0
C184	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C185	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C186	4800	4800	640	640	7200	960	17.3205	2.3094	0	0	0	0
C188	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C189	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C190	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C192	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C193	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C195	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C196	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C197	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C198	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C201	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C205	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C206	10.67	10.67	10.67	10.67	16	16	1.1547	1.1547	0	0	0	0
C207	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C208	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C209	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C210	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C211	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C213	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C218	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C220	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C221	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C222	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C226	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C227	645.33	645.33	234.67	234.67	968	352	6.3509	2.3094	0	0	0	0
C229	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C308	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C309	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C310	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0

Table 2.2 - Frame Section Property Definitions - Summary (Part 2 of 3, continued)

Name	S33Pos in3	S33Neg in3	S22Pos in3	S22Neg in3	Z33 in3	Z22 in3	R33 in	R22 in	CG Offset 3 in	CG Offset 2 in	PNA Offset 3 in	PNA Offset 2 in
C311	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C312	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C372	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C402	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C403	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C404	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C405	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C406	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C463	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C514	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C515	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C524	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C525	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C526	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C527	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C528	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C529	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C530	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C531	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C532	192	192	128	128	288	192	3.4641	2.3094	0	0	0	0
C533	192	192	128	128	288	192	3.4641	2.3094	0	0	0	0
C534	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C535	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C536	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C537	768	768	256	256	1152	384	6.9282	2.3094	0	0	0	0
C538	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C539	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C540	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
C661	341.33	341.33	170.67	170.67	512	256	4.6188	2.3094	0	0	0	0
CMU-W	25392	25392	1472	1472	38088	2208	39.8372	2.3094	0	0	0	0
TB-1	192	192	128	128	288	192	3.4641	2.3094	0	0	0	0
TRELLIS	133.33	133.33	106.67	106.67	200	160	2.8868	2.3094	0	0	0	0

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3)

Name	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
2B-1	1	1	1	1	1	1	1
2B-10	1	1	1	1	1	1	1
2B-11	1	1	1	1	1	1	1
2B-12	1	1	1	1	1	1	1
2B-14	1	1	1	1	1	1	1
2B-15	1	1	1	1	1	1	1
2B-16	1	1	1	1	1	1	1
2B-17	1	1	1	1	1	1	1

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3, continued)

Name	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
2B-18	1	1	1	1	1	1	1
2B-19	1	1	1	1	1	1	1
2B-2	1	1	1	1	1	1	1
2B-21	1	1	1	1	1	1	1
2B-22	1	1	1	1	1	1	1
2B-23	1	1	1	1	1	1	1
2B-24	1	1	1	1	1	1	1
2B-25	1	1	1	1	1	1	1
2B-26	1	1	1	1	1	1	1
2B-29	1	1	1	1	1	1	1
2B-3	1	1	1	1	1	1	1
2B-30	1	1	1	1	1	1	1
2B-34	1	1	1	1	1	1	1
2B-35	1	1	1	1	1	1	1
2B-36	1	1	1	1	1	1	1
2B-37	1	1	1	1	1	1	1
2B-38	1	1	1	1	1	1	1
2B-39	1	1	1	1	1	1	1
2B-4	1	1	1	1	1	1	1
2B-40	1	1	1	1	1	1	1
2B-5	1	1	1	1	1	1	1
2B-6	1	1	1	1	1	1	1
2B-8	1	1	1	1	1	1	1
2B-9	1	1	1	1	1	1	1
C143	1	1	1	1	1	1	1
C144	1	1	1	1	1	1	1
C146	1	1	1	1	1	1	1
C148	1	1	1	1	1	1	1
C149	1	1	1	1	1	1	1
C152	1	1	1	1	1	1	1
C154	1	1	1	1	1	1	1
C157	1	1	1	1	1	1	1
C158	1	1	1	1	1	1	1
C159	1	1	1	1	1	1	1
C162	1	1	1	1	1	1	1
C165	1	1	1	1	1	1	1
C166	1	1	1	1	1	1	1
C168	1	1	1	1	1	1	1
C171	1	1	1	1	1	1	1
C174	1	1	1	1	1	1	1
C176	1	1	1	1	1	1	1
C178	1	1	1	1	1	1	1
C179	1	1	1	1	1	1	1
C180	1	1	1	1	1	1	1
C181	1	1	1	1	1	1	1

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3, continued)

Name	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
C182	1	1	1	1	1	1	1
C183	1	1	1	1	1	1	1
C184	1	1	1	1	1	1	1
C185	1	1	1	1	1	1	1
C186	1	1	1	1	1	1	1
C188	1	1	1	1	1	1	1
C189	1	1	1	1	1	1	1
C190	1	1	1	1	1	1	1
C192	1	1	1	1	1	1	1
C193	1	1	1	1	1	1	1
C195	1	1	1	1	1	1	1
C196	1	1	1	1	1	1	1
C197	1	1	1	1	1	1	1
C198	1	1	1	1	1	1	1
C201	1	1	1	1	1	1	1
C205	1	1	1	1	1	1	1
C206	1	1	1	1	1	1	1
C207	1	1	1	1	1	1	1
C208	1	1	1	1	1	1	1
C209	1	1	1	1	1	1	1
C210	1	1	1	1	1	1	1
C211	1	1	1	1	1	1	1
C213	1	1	1	1	1	1	1
C218	1	1	1	1	1	1	1
C220	1	1	1	1	1	1	1
C221	1	1	1	1	1	1	1
C222	1	1	1	1	1	1	1
C226	1	1	1	1	1	1	1
C227	1	1	1	1	1	1	1
C229	1	1	1	1	1	1	1
C308	1	1	1	1	1	1	1
C309	1	1	1	1	1	1	1
C310	1	1	1	1	1	1	1
C311	1	1	1	1	1	1	1
C312	1	1	1	1	1	1	1
C372	1	1	1	1	1	1	1
C402	1	1	1	1	1	1	1
C403	1	1	1	1	1	1	1
C404	1	1	1	1	1	1	1
C405	1	1	1	1	1	1	1
C406	1	1	1	1	1	1	1
C463	1	1	1	1	1	1	1
C514	1	1	1	1	1	1	1
C515	1	1	1	1	1	1	1
C524	1	1	1	1	1	1	1

Table 2.2 - Frame Section Property Definitions - Summary (Part 3 of 3, continued)

Name	As2 Modifier	As3 Modifier	J Modifier	I33 Modifier	I22 Modifier	Mass Modifier	Weight Modifier
C525	1	1	1	1	1	1	1
C526	1	1	1	1	1	1	1
C527	1	1	1	1	1	1	1
C528	1	1	1	1	1	1	1
C529	1	1	1	1	1	1	1
C530	1	1	1	1	1	1	1
C531	1	1	1	1	1	1	1
C532	1	1	1	1	1	1	1
C533	1	1	1	1	1	1	1
C534	1	1	1	1	1	1	1
C535	1	1	1	1	1	1	1
C536	1	1	1	1	1	1	1
C537	1	1	1	1	1	1	1
C538	1	1	1	1	1	1	1
C539	1	1	1	1	1	1	1
C540	1	1	1	1	1	1	1
C661	1	1	1	1	1	1	1
CMU-W	1	1	1	1	1	1	1
TB-1	1	1	1	1	1	1	1
TRELLIS	1	1	1	1	1	1	1

2.3 Shell Sections

Table 2.3 - Area Section Property Definitions - Summary

Name	Type	Element Type	Material	Total Thickness in
Col_{Stiff}	Slab	Shell-Thin	MAT3	8
Slab8	Slab	Shell-Thin	MAT1	8
Slab9	Slab	Shell-Thin	MAT1	9
WW1	Wall	Shell-Thick	MAT2	8
WW10	Wall	Shell-Thick	MAT2	8
WW100	Wall	Shell-Thick	MAT2	8
WW11	Wall	Shell-Thick	MAT2	8
WW12	Wall	Shell-Thick	MAT2	8
WW13	Wall	Shell-Thick	MAT2	8
WW14	Wall	Shell-Thick	MAT2	8
WW15	Wall	Shell-Thick	MAT2	8
WW17	Wall	Shell-Thick	MAT2	8
WW18	Wall	Shell-Thick	MAT2	8
WW19	Wall	Shell-Thick	MAT2	8
WW2	Wall	Shell-Thick	MAT2	8
WW20	Wall	Shell-Thick	MAT2	8
WW21	Wall	Shell-Thick	MAT2	8
WW22	Wall	Shell-Thick	MAT2	8
WW23	Wall	Shell-Thick	MAT2	8

Table 2.3 - Area Section Property Definitions - Summary (continued)

Name	Type	Element Type	Material	Total Thickness in
WW24	Wall	Shell-Thick	MAT2	8
WW25	Wall	Shell-Thick	MAT2	8
WW26	Wall	Shell-Thick	MAT2	8
WW27	Wall	Shell-Thick	MAT2	8
WW28	Wall	Shell-Thick	MAT2	8
WW29	Wall	Shell-Thick	MAT2	8
WW3	Wall	Shell-Thick	MAT2	8
WW30	Wall	Shell-Thick	MAT2	8
WW31	Wall	Shell-Thick	MAT2	8
WW33	Wall	Shell-Thick	MAT2	8
WW35	Wall	Shell-Thick	MAT2	8
WW36	Wall	Shell-Thick	MAT2	8
WW37	Wall	Shell-Thick	MAT2	8
WW38	Wall	Shell-Thick	MAT2	8
WW39	Wall	Shell-Thick	MAT2	8
WW4	Wall	Shell-Thick	MAT2	8
WW40	Wall	Shell-Thick	MAT2	8
WW41	Wall	Shell-Thick	MAT2	8
WW42	Wall	Shell-Thick	MAT2	8
WW43	Wall	Shell-Thick	MAT2	8
WW44	Wall	Shell-Thick	MAT2	8
WW45	Wall	Shell-Thick	MAT2	8
WW46	Wall	Shell-Thick	MAT2	8
WW47	Wall	Shell-Thick	MAT2	8
WW48	Wall	Shell-Thick	MAT2	8
WW49	Wall	Shell-Thick	MAT2	8
WW5	Wall	Shell-Thick	MAT2	8
WW50	Wall	Shell-Thick	MAT2	8
WW51	Wall	Shell-Thick	MAT2	8
WW52	Wall	Shell-Thick	MAT2	8
WW53	Wall	Shell-Thick	MAT2	8
WW54	Wall	Shell-Thick	MAT2	8
WW55	Wall	Shell-Thick	MAT2	8
WW56	Wall	Shell-Thick	MAT2	8
WW57	Wall	Shell-Thick	MAT2	8
WW58	Wall	Shell-Thick	MAT2	8
WW59	Wall	Shell-Thick	MAT2	8
WW6	Wall	Shell-Thick	MAT2	8
WW60	Wall	Shell-Thick	MAT2	8
WW61	Wall	Shell-Thick	MAT2	8
WW62	Wall	Shell-Thick	MAT2	8
WW63	Wall	Shell-Thick	MAT2	8
WW64	Wall	Shell-Thick	MAT2	8
WW65	Wall	Shell-Thick	MAT2	8

Table 2.3 - Area Section Property Definitions - Summary (continued)

Name	Type	Element Type	Material	Total Thickness in
WW66	Wall	Shell-Thick	MAT2	8
WW67	Wall	Shell-Thick	MAT2	8
WW68	Wall	Shell-Thick	MAT2	8
WW69	Wall	Shell-Thick	MAT2	8
WW7	Wall	Shell-Thick	MAT2	8
WW70	Wall	Shell-Thick	MAT2	8
WW71	Wall	Shell-Thick	MAT2	8
WW72	Wall	Shell-Thick	MAT2	8
WW73	Wall	Shell-Thick	MAT2	8
WW74	Wall	Shell-Thick	MAT2	8
WW8	Wall	Shell-Thick	MAT2	8
WW9	Wall	Shell-Thick	MAT2	8
WW99	Wall	Shell-Thick	MAT2	8

2.4 Reinforcement Sizes

Table 2.4 - Reinforcing Bar Sizes

Name	Diameter in	Area in2
#4	0.5	0.2

3 Assignments

This chapter provides a listing of the assignments applied to the model.

3.1 Joint Assignments

Table 3.1 - Joint Assignments - Summary

UniqueName	Diaphragm	Restraints
143	From Area	
144	From Area	
145	From Area	
146	From Area	
147	From Area	
148	From Area	
149	From Area	
150	From Area	
151	From Area	
152	From Area	
154	From Area	
155	From Area	
156	From Area	
157	From Area	
158	From Area	
159	From Area	
162	From Area	
163	From Area	
164	From Area	
165	From Area	
166	From Area	
167	From Area	
168	From Area	
170	From Area	
171	From Area	
172	From Area	
173	From Area	
174	From Area	
175	From Area	
176	From Area	
177	From Area	
178	From Area	
179	From Area	
180	From Area	
181	From Area	
182	From Area	
183	From Area	
184	From Area	
185	From Area	
186	From Area	
188	From Area	
189	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
190	From Area	
191	From Area	
192	From Area	
193	From Area	
194	From Area	
195	From Area	
196	From Area	
197	From Area	
198	From Area	
200	From Area	
201	From Area	
203	From Area	
204	From Area	
205	From Area	
206	From Area	
207	From Area	
208	From Area	
209	From Area	
210	From Area	
211	From Area	
213	From Area	
214	From Area	
215	From Area	
216	From Area	
217	From Area	
218	From Area	
219	From Area	
220	From Area	
221	From Area	
222	From Area	
223	From Area	
224	From Area	
225	From Area	
226	From Area	
227	From Area	
228	From Area	
229	From Area	
308	From Area	
309	From Area	
310	From Area	
311	From Area	
312	From Area	
372	From Area	
402	From Area	
403	From Area	
404	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
405	From Area	
406	From Area	
463	From Area	
514	From Area	
515	From Area	
524	From Area	
525	From Area	
526	From Area	
527	From Area	
528	From Area	
529	From Area	
530	From Area	
531	From Area	
532	From Area	
533	From Area	
534	From Area	
535	From Area	
536	From Area	
537	From Area	
538	From Area	
539	From Area	
540	From Area	
553	From Area	
561	From Area	
575	From Area	
576	From Area	
580	From Area	
581	From Area	
582	From Area	
588	From Area	
589	From Area	
592	From Area	
597	From Area	
599	From Area	
600	From Area	
604	From Area	
661	From Area	
664	From Area	
663	From Area	
666	From Area	
P1563	From Area	
P1564	From Area	
P1565	From Area	
P1566	From Area	
P1567	From Area	
P1568	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
P1569	From Area	
P1570	From Area	
P1571	From Area	
P1572	From Area	
P1573	From Area	
P1574	From Area	
P1575	From Area	
P1576	From Area	
P1577	From Area	
P1578	From Area	
P1579	From Area	
P1580	From Area	
P1581	From Area	
P1582	From Area	
P1583	From Area	
P1584	From Area	
P1585	From Area	
P1586	From Area	
P1587	From Area	
P1588	From Area	
P1589	From Area	
P1590	From Area	
P1591	From Area	
P1592	From Area	
P1593	From Area	
P1594	From Area	
P1595	From Area	
P1596	From Area	
P1597	From Area	
P1598	From Area	
P1599	From Area	
P1600	From Area	
P1601	From Area	
P1602	From Area	
P1603	From Area	
P1604	From Area	
P1605	From Area	
P1606	From Area	
P1607	From Area	
P1608	From Area	
P1609	From Area	
P1610	From Area	
P1611	From Area	
P1612	From Area	
P1613	From Area	
P1614	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
P1615	From Area	
P1616	From Area	
P1617	From Area	
P1618	From Area	
P1619	From Area	
P1620	From Area	
P1621	From Area	
P1622	From Area	
P1623	From Area	
P1624	From Area	
P1625	From Area	
P1626	From Area	
P1627	From Area	
P1628	From Area	
P1629	From Area	
P1630	From Area	
P1631	From Area	
P1632	From Area	
P1633	From Area	
P1634	From Area	
P1635	From Area	
P1636	From Area	
P1637	From Area	
283	From Area	
284	From Area	
285	From Area	
286	From Area	
287	From Area	
288	From Area	
289	From Area	
290	From Area	
291	From Area	
292	From Area	
293	From Area	
294	From Area	
295	From Area	
296	From Area	
297	From Area	
298	From Area	
299	From Area	
300	From Area	
301	From Area	
302	From Area	
303	From Area	
304	From Area	
305	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
306	From Area	
307	From Area	
313	From Area	
314	From Area	
315	From Area	
316	From Area	
317	From Area	
318	From Area	
319	From Area	
320	From Area	
321	From Area	
322	From Area	
323	From Area	
324	From Area	
325	From Area	
326	From Area	
327	From Area	
328	From Area	
329	From Area	
330	From Area	
331	From Area	
332	From Area	
333	From Area	
334	From Area	
335	From Area	
336	From Area	
337	From Area	
338	From Area	
339	From Area	
340	From Area	
341	From Area	
342	From Area	
343	From Area	
344	From Area	
345	From Area	
346	From Area	
347	From Area	
348	From Area	
349	From Area	
350	From Area	
351	From Area	
352	From Area	
353	From Area	
354	From Area	
355	From Area	
356	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
357	From Area	
358	From Area	
359	From Area	
360	From Area	
361	From Area	
362	From Area	
363	From Area	
364	From Area	
365	From Area	
366	From Area	
367	From Area	
368	From Area	
369	From Area	
370	From Area	
371	From Area	
373	From Area	
374	From Area	
375	From Area	
376	From Area	
377	From Area	
378	From Area	
379	From Area	
380	From Area	
381	From Area	
382	From Area	
383	From Area	
384	From Area	
385	From Area	
386	From Area	
387	From Area	
388	From Area	
389	From Area	
390	From Area	
391	From Area	
392	From Area	
393	From Area	
394	From Area	
395	From Area	
396	From Area	
397	From Area	
398	From Area	
399	From Area	
400	From Area	
401	From Area	
407	From Area	
408	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
409	From Area	
410	From Area	
411	From Area	
412	From Area	
413	From Area	
414	From Area	
415	From Area	
416	From Area	
417	From Area	
418	From Area	
419	From Area	
420	From Area	
421	From Area	
422	From Area	
423	From Area	
424	From Area	
425	From Area	
426	From Area	
427	From Area	
428	From Area	
429	From Area	
430	From Area	
431	From Area	
432	From Area	
433	From Area	
434	From Area	
435	From Area	
436	From Area	
437	From Area	
438	From Area	
439	From Area	
440	From Area	
441	From Area	
442	From Area	
443	From Area	
444	From Area	
445	From Area	
446	From Area	
447	From Area	
448	From Area	
449	From Area	
450	From Area	
451	From Area	
452	From Area	
453	From Area	
454	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
455	From Area	
456	From Area	
457	From Area	
458	From Area	
459	From Area	
460	From Area	
461	From Area	
462	From Area	
464	From Area	
465	From Area	
466	From Area	
467	From Area	
468	From Area	
469	From Area	
470	From Area	
471	From Area	
472	From Area	
473	From Area	
474	From Area	
475	From Area	
476	From Area	
477	From Area	
478	From Area	
479	From Area	
480	From Area	
481	From Area	
482	From Area	
483	From Area	
484	From Area	
485	From Area	
486	From Area	
487	From Area	
488	From Area	
489	From Area	
490	From Area	
491	From Area	
492	From Area	
493	From Area	
494	From Area	
495	From Area	
496	From Area	
497	From Area	
498	From Area	
499	From Area	
500	From Area	
501	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
502	From Area	
503	From Area	
504	From Area	
505	From Area	
506	From Area	
507	From Area	
508	From Area	
509	From Area	
510	From Area	
511	From Area	
512	From Area	
513	From Area	
516	From Area	
517	From Area	
518	From Area	
519	From Area	
520	From Area	
521	From Area	
522	From Area	
523	From Area	
541	From Area	
542	From Area	
543	From Area	
544	From Area	
545	From Area	
546	From Area	
547	From Area	
548	From Area	
549	From Area	
550	From Area	
551	From Area	
552	From Area	
554	From Area	
555	From Area	
556	From Area	
557	From Area	
558	From Area	
559	From Area	
560	From Area	
562	From Area	
563	From Area	
564	From Area	
565	From Area	
566	From Area	
567	From Area	
568	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
569	From Area	
570	From Area	
571	From Area	
572	From Area	
573	From Area	
574	From Area	
577	From Area	
578	From Area	
579	From Area	
583	From Area	
584	From Area	
585	From Area	
586	From Area	
587	From Area	
590	From Area	
591	From Area	
593	From Area	
594	From Area	
595	From Area	
596	From Area	
598	From Area	
601	From Area	
602	From Area	
603	From Area	
605	From Area	
606	From Area	
607	From Area	
608	From Area	
609	From Area	
610	From Area	
611	From Area	
612	From Area	
613	From Area	
614	From Area	
615	From Area	
616	From Area	
617	From Area	
618	From Area	
619	From Area	
620	From Area	
621	From Area	
622	From Area	
623	From Area	
624	From Area	
625	From Area	
626	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
627	From Area	
628	From Area	
629	From Area	
630	From Area	
631	From Area	
632	From Area	
633	From Area	
634	From Area	
635	From Area	
636	From Area	
637	From Area	
638	From Area	
639	From Area	
640	From Area	
641	From Area	
642	From Area	
643	From Area	
644	From Area	
645	From Area	
646	From Area	
647	From Area	
648	From Area	
649	From Area	
650	From Area	
651	From Area	
652	From Area	
653	From Area	
654	From Area	
655	From Area	
656	From Area	
657	From Area	
658	From Area	
659	From Area	
660	From Area	
662	From Area	
665	From Area	
667	From Area	
668	From Area	
669	From Area	
670	From Area	
671	From Area	
672	From Area	
673	From Area	
674	From Area	
675	From Area	
676	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
677	From Area	
678	From Area	
679	From Area	
680	From Area	
681	From Area	
682	From Area	
683	From Area	
684	From Area	
685	From Area	
686	From Area	
687	From Area	
688	From Area	
689	From Area	
690	From Area	
691	From Area	
692	From Area	
693	From Area	
694	From Area	
695	From Area	
696	From Area	
697	From Area	
698	From Area	
699	From Area	
700	From Area	
701	From Area	
702	From Area	
703	From Area	
704	From Area	
705	From Area	
706	From Area	
707	From Area	
708	From Area	
709	From Area	
710	From Area	
711	From Area	
712	From Area	
713	From Area	
714	From Area	
715	From Area	
716	From Area	
717	From Area	
718	From Area	
719	From Area	
720	From Area	
721	From Area	
722	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
723	From Area	
724	From Area	
725	From Area	
726	From Area	
727	From Area	
728	From Area	
729	From Area	
730	From Area	
731	From Area	
732	From Area	
733	From Area	
734	From Area	
735	From Area	
736	From Area	
737	From Area	
738	From Area	
739	From Area	
740	From Area	
741	From Area	
742	From Area	
743	From Area	
744	From Area	
745	From Area	
746	From Area	
747	From Area	
748	From Area	
749	From Area	
750	From Area	
751	From Area	
752	From Area	
753	From Area	
754	From Area	
755	From Area	
756	From Area	
757	From Area	
758	From Area	
759	From Area	
760	From Area	
761	From Area	
762	From Area	
763	From Area	
764	From Area	
765	From Area	
766	From Area	
767	From Area	
768	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
769	From Area	
770	From Area	
771	From Area	
772	From Area	
773	From Area	
774	From Area	
775	From Area	
776	From Area	
777	From Area	
778	From Area	
779	From Area	
780	From Area	
781	From Area	
782	From Area	
783	From Area	
784	From Area	
785	From Area	
786	From Area	
787	From Area	
788	From Area	
789	From Area	
790	From Area	
791	From Area	
792	From Area	
793	From Area	
794	From Area	
795	From Area	
796	From Area	
797	From Area	
798	From Area	
799	From Area	
800	From Area	
801	From Area	
802	From Area	
803	From Area	
804	From Area	
805	From Area	
806	From Area	
807	From Area	
808	From Area	
809	From Area	
810	From Area	
811	From Area	
812	From Area	
813	From Area	
814	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
815	From Area	
816	From Area	
817	From Area	
818	From Area	
819	From Area	
820	From Area	
821	From Area	
822	From Area	
823	From Area	
824	From Area	
825	From Area	
826	From Area	
827	From Area	
828	From Area	
829	From Area	
830	From Area	
831	From Area	
832	From Area	
833	From Area	
834	From Area	
835	From Area	
836	From Area	
837	From Area	
838	From Area	
839	From Area	
840	From Area	
841	From Area	
842	From Area	
843	From Area	
844	From Area	
845	From Area	
846	From Area	
847	From Area	
848	From Area	
849	From Area	
850	From Area	
851	From Area	
852	From Area	
853	From Area	
854	From Area	
855	From Area	
856	From Area	
857	From Area	
858	From Area	
859	From Area	
860	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
861	From Area	
862	From Area	
863	From Area	
864	From Area	
865	From Area	
866	From Area	
867	From Area	
868	From Area	
869	From Area	
870	From Area	
871	From Area	
872	From Area	
873	From Area	
874	From Area	
875	From Area	
876	From Area	
877	From Area	
878	From Area	
879	From Area	
880	From Area	
881	From Area	
882	From Area	
883	From Area	
884	From Area	
885	From Area	
886	From Area	
887	From Area	
888	From Area	
889	From Area	
890	From Area	
891	From Area	
892	From Area	
893	From Area	
894	From Area	
895	From Area	
896	From Area	
897	From Area	
898	From Area	
899	From Area	
900	From Area	
901	From Area	
902	From Area	
903	From Area	
904	From Area	
905	From Area	
906	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
907	From Area	
908	From Area	
909	From Area	
910	From Area	
911	From Area	
912	From Area	
913	From Area	
914	From Area	
915	From Area	
916	From Area	
917	From Area	
918	From Area	
919	From Area	
920	From Area	
921	From Area	
922	From Area	
923	From Area	
924	From Area	
925	From Area	
926	From Area	
927	From Area	
928	From Area	
929	From Area	
930	From Area	
931	From Area	
932	From Area	
933	From Area	
934	From Area	
935	From Area	
936	From Area	
937	From Area	
938	From Area	
939	From Area	
940	From Area	
941	From Area	
942	From Area	
943	From Area	
944	From Area	
945	From Area	
946	From Area	
947	From Area	
948	From Area	
949	From Area	
950	From Area	
951	From Area	
952	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
953	From Area	
954	From Area	
955	From Area	
956	From Area	
957	From Area	
958	From Area	
959	From Area	
960	From Area	
961	From Area	
962	From Area	
963	From Area	
964	From Area	
965	From Area	
966	From Area	
967	From Area	
968	From Area	
9	From Area	
57	From Area	
13	From Area	
15	From Area	
17	From Area	
10	From Area	
14	From Area	
16	From Area	
18	From Area	
19	From Area	
20	From Area	
21	From Area	
22	From Area	
23	From Area	
24	From Area	
25	From Area	
26	From Area	
27	From Area	
28	From Area	
29	From Area	
30	From Area	
31	From Area	
32	From Area	
33	From Area	
34	From Area	
35	From Area	
36	From Area	
37	From Area	
38	From Area	
39	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
40	From Area	
41	From Area	
42	From Area	
43	From Area	
44	From Area	
45	From Area	
46	From Area	
47	From Area	
48	From Area	
49	From Area	
50	From Area	
51	From Area	
52	From Area	
53	From Area	
54	From Area	
55	From Area	
56	From Area	
58	From Area	
59	From Area	
60	From Area	
61	From Area	
62	From Area	
63	From Area	
64	From Area	
65	From Area	
68	From Area	
69	From Area	
70	From Area	
71	From Area	
72	From Area	
73	From Area	
74	From Area	
75	From Area	
76	From Area	
77	From Area	
78	From Area	
79	From Area	
80	From Area	
81	From Area	
82	From Area	
83	From Area	
84	From Area	
85	From Area	
86	From Area	
87	From Area	
88	From Area	

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
89	From Area	
90	From Area	
91	From Area	
92	From Area	
93	From Area	
94	From Area	
95	From Area	
96	From Area	
97	From Area	
98	From Area	
99	From Area	
100	From Area	
101	From Area	
102	From Area	
103	From Area	
104	From Area	
105	From Area	
106	From Area	
107	From Area	
108	From Area	
109	From Area	
110	From Area	
111	From Area	
112	From Area	
113	From Area	
114	From Area	
115	From Area	
116	From Area	
1038	From Area	UX; UY; UZ; RX; RY; RZ
1014	From Area	UX; UY; UZ; RX; RY; RZ
1039	From Area	UX; UY; UZ; RX; RY; RZ
1007	From Area	UX; UY; UZ; RX; RY; RZ
1009	From Area	UX; UY; UZ; RX; RY; RZ
996	From Area	UX; UY; UZ; RX; RY; RZ
995	From Area	UX; UY; UZ; RX; RY; RZ
1012	From Area	UX; UY; UZ; RX; RY; RZ
1037	From Area	UX; UY; UZ; RX; RY; RZ
1011	From Area	UX; UY; UZ; RX; RY; RZ
1041	From Area	UX; UY; UZ; RX; RY; RZ
1005	From Area	UX; UY; UZ; RX; RY; RZ
1010	From Area	UX; UY; UZ; RX; RY; RZ
1016	From Area	UX; UY; UZ; RX; RY; RZ
1020	From Area	UX; UY; UZ; RX; RY; RZ
1042	From Area	UX; UY; UZ; RX; RY; RZ
1043	From Area	UX; UY; UZ; RX; RY; RZ
1028	From Area	UX; UY; UZ; RX; RY; RZ

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
1022	From Area	UX; UY; UZ; RX; RY; RZ
1044	From Area	UX; UY; UZ; RX; RY; RZ
1023	From Area	UX; UY; UZ; RX; RY; RZ
1021	From Area	UX; UY; UZ; RX; RY; RZ
1025	From Area	UX; UY; UZ; RX; RY; RZ
1024	From Area	UX; UY; UZ; RX; RY; RZ
1027	From Area	UX; UY; UZ; RX; RY; RZ
1026	From Area	UX; UY; UZ; RX; RY; RZ
1008	From Area	UX; UY; UZ; RX; RY; RZ
1002	From Area	UX; UY; UZ; RX; RY; RZ
1001	From Area	UX; UY; UZ; RX; RY; RZ
1004	From Area	UX; UY; UZ; RX; RY; RZ
1029	From Area	UX; UY; UZ; RX; RY; RZ
1064	From Area	UX; UY; UZ; RX; RY; RZ
1006	From Area	UX; UY; UZ; RX; RY; RZ
1035	From Area	UX; UY; UZ; RX; RY; RZ
1036	From Area	UX; UY; UZ; RX; RY; RZ
1050	From Area	UX; UY; UZ; RX; RY; RZ
1049	From Area	UX; UY; UZ; RX; RY; RZ
1048	From Area	UX; UY; UZ; RX; RY; RZ
1047	From Area	UX; UY; UZ; RX; RY; RZ
983	From Area	UX; UY; UZ; RX; RY; RZ
997	From Area	UX; UY; UZ; RX; RY; RZ
998	From Area	UX; UY; UZ; RX; RY; RZ
999	From Area	UX; UY; UZ; RX; RY; RZ
994	From Area	UX; UY; UZ; RX; RY; RZ
1003	From Area	UX; UY; UZ; RX; RY; RZ
1086	From Area	UX; UY; UZ; RX; RY; RZ
1071	From Area	UX; UY; UZ; RX; RY; RZ
1087	From Area	UX; UY; UZ; RX; RY; RZ
1085	From Area	UX; UY; UZ; RX; RY; RZ
1033	From Area	UX; UY; UZ; RX; RY; RZ
1032	From Area	UX; UY; UZ; RX; RY; RZ
1031	From Area	UX; UY; UZ; RX; RY; RZ
1034	From Area	UX; UY; UZ; RX; RY; RZ
1062	From Area	UX; UY; UZ; RX; RY; RZ
1075	From Area	UX; UY; UZ; RX; RY; RZ
991	From Area	UX; UY; UZ; RX; RY; RZ
990	From Area	UX; UY; UZ; RX; RY; RZ
989	From Area	UX; UY; UZ; RX; RY; RZ
986	From Area	UX; UY; UZ; RX; RY; RZ
987	From Area	UX; UY; UZ; RX; RY; RZ
985	From Area	UX; UY; UZ; RX; RY; RZ
981	From Area	UX; UY; UZ; RX; RY; RZ
982	From Area	UX; UY; UZ; RX; RY; RZ
976	From Area	UX; UY; UZ; RX; RY; RZ

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
969	From Area	UX; UY; UZ; RX; RY; RZ
977	From Area	UX; UY; UZ; RX; RY; RZ
975	From Area	UX; UY; UZ; RX; RY; RZ
978	From Area	UX; UY; UZ; RX; RY; RZ
974	From Area	UX; UY; UZ; RX; RY; RZ
973	From Area	UX; UY; UZ; RX; RY; RZ
971	From Area	UX; UY; UZ; RX; RY; RZ
970	From Area	UX; UY; UZ; RX; RY; RZ
972	From Area	UX; UY; UZ; RX; RY; RZ
979	From Area	UX; UY; UZ; RX; RY; RZ
980	From Area	UX; UY; UZ; RX; RY; RZ
984	From Area	UX; UY; UZ; RX; RY; RZ
988	From Area	UX; UY; UZ; RX; RY; RZ
992	From Area	UX; UY; UZ; RX; RY; RZ
993	From Area	UX; UY; UZ; RX; RY; RZ
1000	From Area	UX; UY; UZ; RX; RY; RZ
1013	From Area	UX; UY; UZ; RX; RY; RZ
1015	From Area	UX; UY; UZ; RX; RY; RZ
1017	From Area	UX; UY; UZ; RX; RY; RZ
1018	From Area	UX; UY; UZ; RX; RY; RZ
1019	From Area	UX; UY; UZ; RX; RY; RZ
1030	From Area	UX; UY; UZ; RX; RY; RZ
1040	From Area	UX; UY; UZ; RX; RY; RZ
1045	From Area	UX; UY; UZ; RX; RY; RZ
1046	From Area	UX; UY; UZ; RX; RY; RZ
1073	From Area	UX; UY; UZ; RX; RY; RZ
1070	From Area	UX; UY; UZ; RX; RY; RZ
1063	From Area	UX; UY; UZ; RX; RY; RZ
1076	From Area	UX; UY; UZ; RX; RY; RZ
1077	From Area	UX; UY; UZ; RX; RY; RZ
1088	From Area	UX; UY; UZ; RX; RY; RZ
1051	From Area	UX; UY; UZ; RX; RY; RZ
1068	From Area	UX; UY; UZ; RX; RY; RZ
1069	From Area	UX; UY; UZ; RX; RY; RZ
1066	From Area	UX; UY; UZ; RX; RY; RZ
1067	From Area	UX; UY; UZ; RX; RY; RZ
1090	From Area	UX; UY; UZ; RX; RY; RZ
1065	From Area	UX; UY; UZ; RX; RY; RZ
1058	From Area	UX; UY; UZ; RX; RY; RZ
1060	From Area	UX; UY; UZ; RX; RY; RZ
1053	From Area	UX; UY; UZ; RX; RY; RZ
1054	From Area	UX; UY; UZ; RX; RY; RZ
1055	From Area	UX; UY; UZ; RX; RY; RZ
1091	From Area	UX; UY; UZ; RX; RY; RZ
1057	From Area	UX; UY; UZ; RX; RY; RZ
1078	From Area	UX; UY; UZ; RX; RY; RZ

Table 3.1 - Joint Assignments - Summary (continued)

UniqueName	Diaphragm	Restraints
1080	From Area	UX; UY; UZ; RX; RY; RZ
1081	From Area	UX; UY; UZ; RX; RY; RZ
1052	From Area	UX; UY; UZ; RX; RY; RZ
1056	From Area	UX; UY; UZ; RX; RY; RZ
1059	From Area	UX; UY; UZ; RX; RY; RZ
1061	From Area	UX; UY; UZ; RX; RY; RZ
1072	From Area	UX; UY; UZ; RX; RY; RZ
1074	From Area	UX; UY; UZ; RX; RY; RZ
1079	From Area	UX; UY; UZ; RX; RY; RZ
1082	From Area	UX; UY; UZ; RX; RY; RZ
1083	From Area	UX; UY; UZ; RX; RY; RZ
1084	From Area	UX; UY; UZ; RX; RY; RZ
1089	From Area	UX; UY; UZ; RX; RY; RZ

3.2 Frame Assignments

Table 3.2 - Frame Assignments - Summary

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B1	Beam	5.9951	TB-1	TB-1		3
B2	Beam	9.2808	CMU-W	N/A		3
B3	Beam	8.0379	CMU-W	N/A		3
B4	Beam	0.8475	CMU-W	N/A		3
B5	Beam	8.0379	CMU-W	N/A		3
B6	Beam	0.8475	CMU-W	N/A		3
B7	Beam	5.5736	CMU-W	N/A		3
B8	Beam	1.4577	CMU-W	N/A		3
B9	Beam	1.3137	2B-10	2B-10		3
B10	Beam	5.5736	2B-10	2B-10		3
B11	Beam	46.1823	2B-39	2B-39		3
B12	Beam	1.6075	CMU-W	N/A		3
B13	Beam	16.8982	2B-34	2B-34		3
B14	Beam	8.0412	CMU-W	N/A		3
B15	Beam	9.5327	2B-29	2B-29		3
B16	Beam	10.6657	2B-30	2B-30		3
B17	Beam	3.2532	TB-1	TB-1		3
B18	Beam	17.4226	CMU-W	N/A		3
B19	Beam	2.6327	CMU-W	N/A		3
B20	Beam	4.2413	CMU-W	N/A		3
B21	Beam	3.4356	CMU-W	N/A		3
B22	Beam	0.699	TB-1	TB-1		3
B23	Beam	13.2071	2B-16	2B-16		3
B24	Beam	0.845	2B-16	2B-16		3
B25	Beam	12.4948	2B-17	2B-17		3
B26	Beam	2.5885	2B-17	2B-17		3
B27	Beam	10.9375	CMU-W	N/A		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B28	Beam	8.2187	CMU-W	N/A		3
B29	Beam	2.2486	CMU-W	N/A		3
B30	Beam	2.1697	CMU-W	N/A		3
B31	Beam	6.4545	2B-22	2B-22		3
B32	Beam	5.3616	2B-40	2B-40		3
B33	Beam	24.3646	2B-37	2B-37		3
B34	Beam	13.9858	2B-21	2B-21		3
B35	Beam	2.2486	2B-21	2B-21		3
B36	Beam	5.619	2B-23	2B-23		3
B37	Beam	5.3185	2B-23	2B-23		3
B38	Beam	13.6458	2B-19	2B-19		3
B39	Beam	15.2188	2B-24	2B-24		3
B40	Beam	6.625	TB-1	TB-1		3
B41	Beam	12.7604	2B-14	2B-14		3
B42	Beam	13.0863	2B-14	2B-14		3
B43	Beam	14.7204	2B-15	2B-15		3
B44	Beam	4.9869	CMU-W	N/A		3
B45	Beam	5.5833	2B-37	2B-37		3
B46	Beam	5.9951	TB-1	TB-1		3
B47	Beam	11.1667	2B-38	2B-38		3
B48	Beam	35.0156	2B-38	2B-38		3
B49	Beam	6.2918	TB-1	TB-1		3
B50	Beam	6.0313	CMU-W	N/A		3
B51	Beam	3.4896	TB-1	TB-1		3
B52	Beam	14.1962	2B-12	2B-12		3
B53	Beam	9.9137	2B-12	2B-12		3
B54	Beam	0.1866	TB-1	TB-1		3
B55	Beam	2.207	2B-12	2B-12		3
B56	Beam	12.8452	2B-12	2B-12		3
B57	Beam	2.5176	CMU-W	N/A		3
B58	Beam	12.8625	2B-35	2B-35		3
B59	Beam	8.6048	CMU-W	N/A		3
B60	Beam	6.6747	2B-10	2B-10		3
B61	Beam	6.7214	2B-10	2B-10		3
B62	Beam	9.8682	2B-10	2B-10		3
B63	Beam	6.0313	2B-11	2B-11		3
B64	Beam	6.8958	TB-1	TB-1		3
B65	Beam	11.5361	2B-14	2B-14		3
B66	Beam	6.0313	2B-14	2B-14		3
B67	Beam	6.0833	TB-1	TB-1		3
B68	Beam	4.93	TB-1	TB-1		3
B70	Beam	2.2206	2B-26	2B-26		3
B71	Beam	13.4773	2B-25	2B-25		3
B72	Beam	23.1592	CMU-W	N/A		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B73	Beam	1.9867	2B-36	2B-36		3
B74	Beam	5.9951	TB-1	TB-1		3
B75	Beam	14.3434	2B-9	2B-9		3
B76	Beam	5.2448	2B-9	2B-9		3
B77	Beam	8.4896	2B-9	2B-9		3
B78	Beam	11.2751	2B-9	2B-9		3
B79	Beam	5.5736	TRELLIS	TRELLIS		3
B80	Beam	4	TRELLIS	TRELLIS		3
B81	Beam	5.5736	TRELLIS	TRELLIS		3
B82	Beam	4	TRELLIS	TRELLIS		3
B83	Beam	5.5736	TRELLIS	TRELLIS		3
B84	Beam	4	TRELLIS	TRELLIS		3
B85	Beam	5.5736	TRELLIS	TRELLIS		3
B86	Beam	4	TRELLIS	TRELLIS		3
B87	Beam	5.5736	TRELLIS	TRELLIS		3
B88	Beam	4	TRELLIS	TRELLIS		3
B89	Beam	5.5736	TRELLIS	TRELLIS		3
B90	Beam	4	TRELLIS	TRELLIS		3
B91	Beam	5.5736	TRELLIS	TRELLIS		3
B92	Beam	4	TRELLIS	TRELLIS		3
B93	Beam	5.5736	TRELLIS	TRELLIS		3
B94	Beam	4	TRELLIS	TRELLIS		3
B95	Beam	5.5736	TRELLIS	TRELLIS		3
B96	Beam	4	TRELLIS	TRELLIS		3
B97	Beam	5.5736	TRELLIS	TRELLIS		3
B98	Beam	4	TRELLIS	TRELLIS		3
B99	Beam	5.5736	TRELLIS	TRELLIS		3
B100	Beam	4	TRELLIS	TRELLIS		3
B101	Beam	5.5736	TRELLIS	TRELLIS		3
B102	Beam	4	TRELLIS	TRELLIS		3
B103	Beam	5.5736	TRELLIS	TRELLIS		3
B104	Beam	4	TRELLIS	TRELLIS		3
B105	Beam	5.5736	TRELLIS	TRELLIS		3
B106	Beam	4	TRELLIS	TRELLIS		3
B107	Beam	5.5736	TRELLIS	TRELLIS		3
B108	Beam	4	TRELLIS	TRELLIS		3
B109	Beam	5.5736	TRELLIS	TRELLIS		3
B110	Beam	4	TRELLIS	TRELLIS		3
B111	Beam	5.5736	TRELLIS	TRELLIS		3
B112	Beam	4	TRELLIS	TRELLIS		3
B113	Beam	5.5736	TRELLIS	TRELLIS		3
B114	Beam	4	TRELLIS	TRELLIS		3
B115	Beam	5.5736	TRELLIS	TRELLIS		3
B116	Beam	4	TRELLIS	TRELLIS		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B117	Beam	5.5736	TRELLIS	TRELLIS		3
B118	Beam	4	TRELLIS	TRELLIS		3
B119	Beam	5.5736	TRELLIS	TRELLIS		3
B120	Beam	4	TRELLIS	TRELLIS		3
B121	Beam	5.5736	TRELLIS	TRELLIS		3
B122	Beam	4	TRELLIS	TRELLIS		3
B123	Beam	5.5736	TRELLIS	TRELLIS		3
B124	Beam	4	TRELLIS	TRELLIS		3
B125	Beam	5.5736	TRELLIS	TRELLIS		3
B126	Beam	4	TRELLIS	TRELLIS		3
B127	Beam	5.5736	TRELLIS	TRELLIS		3
B128	Beam	4	TRELLIS	TRELLIS		3
B129	Beam	5.5736	TRELLIS	TRELLIS		3
B130	Beam	4	TRELLIS	TRELLIS		3
B131	Beam	13.8432	2B-8	2B-8		3
B132	Beam	20.9668	CMU-W	N/A		3
B133	Beam	14.865	2B-6	2B-6		3
B134	Beam	88.9584	TRELLIS	TRELLIS		3
B135	Beam	5.1	TRELLIS	TRELLIS		3
B136	Beam	4	TRELLIS	TRELLIS		3
B137	Beam	5.1	TRELLIS	TRELLIS		3
B138	Beam	4	TRELLIS	TRELLIS		3
B139	Beam	5.1	TRELLIS	TRELLIS		3
B140	Beam	4	TRELLIS	TRELLIS		3
B141	Beam	5.1	TRELLIS	TRELLIS		3
B142	Beam	4	TRELLIS	TRELLIS		3
B143	Beam	5.1	TRELLIS	TRELLIS		3
B144	Beam	4	TRELLIS	TRELLIS		3
B145	Beam	5.1	TRELLIS	TRELLIS		3
B146	Beam	4	TRELLIS	TRELLIS		3
B147	Beam	5.1	TRELLIS	TRELLIS		3
B148	Beam	4	TRELLIS	TRELLIS		3
B149	Beam	5.1	TRELLIS	TRELLIS		3
B150	Beam	4	TRELLIS	TRELLIS		3
B151	Beam	5.1	TRELLIS	TRELLIS		3
B152	Beam	4	TRELLIS	TRELLIS		3
B153	Beam	5.1	TRELLIS	TRELLIS		3
B154	Beam	4	TRELLIS	TRELLIS		3
B155	Beam	5.1	TRELLIS	TRELLIS		3
B156	Beam	4	TRELLIS	TRELLIS		3
B157	Beam	5.1	TRELLIS	TRELLIS		3
B158	Beam	4	TRELLIS	TRELLIS		3
B159	Beam	5.1	TRELLIS	TRELLIS		3
B160	Beam	4	TRELLIS	TRELLIS		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B161	Beam	5.1	TRELLIS	TRELLIS		3
B162	Beam	4	TRELLIS	TRELLIS		3
B163	Beam	5.1	TRELLIS	TRELLIS		3
B164	Beam	4	TRELLIS	TRELLIS		3
B165	Beam	5.1	TRELLIS	TRELLIS		3
B166	Beam	4	TRELLIS	TRELLIS		3
B167	Beam	5.1	TRELLIS	TRELLIS		3
B168	Beam	4	TRELLIS	TRELLIS		3
B169	Beam	5.1	TRELLIS	TRELLIS		3
B170	Beam	4	TRELLIS	TRELLIS		3
B171	Beam	5.1	TRELLIS	TRELLIS		3
B172	Beam	4	TRELLIS	TRELLIS		3
B173	Beam	5.1	TRELLIS	TRELLIS		3
B174	Beam	4	TRELLIS	TRELLIS		3
B175	Beam	5.1	TRELLIS	TRELLIS		3
B176	Beam	4	TRELLIS	TRELLIS		3
B177	Beam	5.1	TRELLIS	TRELLIS		3
B178	Beam	4	TRELLIS	TRELLIS		3
B179	Beam	5.1	TRELLIS	TRELLIS		3
B180	Beam	4	TRELLIS	TRELLIS		3
B181	Beam	5.1	TRELLIS	TRELLIS		3
B182	Beam	4	TRELLIS	TRELLIS		3
B183	Beam	5.1	TRELLIS	TRELLIS		3
B184	Beam	4	TRELLIS	TRELLIS		3
B185	Beam	5.1	TRELLIS	TRELLIS		3
B186	Beam	4	TRELLIS	TRELLIS		3
B187	Beam	5.1	TRELLIS	TRELLIS		3
B188	Beam	4	TRELLIS	TRELLIS		3
B189	Beam	5.1	TRELLIS	TRELLIS		3
B190	Beam	4	TRELLIS	TRELLIS		3
B191	Beam	5.1	TRELLIS	TRELLIS		3
B192	Beam	4	TRELLIS	TRELLIS		3
B193	Beam	14.9275	2B-1	2B-1		3
B194	Beam	19.4098	2B-3	2B-3		3
B195	Beam	16.5273	2B-3	2B-3		3
B196	Beam	16.5273	2B-4	2B-4		3
B197	Beam	19.4098	2B-4	2B-4		3
B198	Beam	5.1	TRELLIS	TRELLIS		3
B199	Beam	4	TRELLIS	TRELLIS		3
B200	Beam	5.1	TRELLIS	TRELLIS		3
B201	Beam	4	TRELLIS	TRELLIS		3
B202	Beam	5.1	TRELLIS	TRELLIS		3
B203	Beam	4	TRELLIS	TRELLIS		3
B204	Beam	5.1	TRELLIS	TRELLIS		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B205	Beam	4	TRELLIS	TRELLIS		3
B206	Beam	5.1	TRELLIS	TRELLIS		3
B207	Beam	4	TRELLIS	TRELLIS		3
B208	Beam	5.1	TRELLIS	TRELLIS		3
B209	Beam	4	TRELLIS	TRELLIS		3
B210	Beam	5.1	TRELLIS	TRELLIS		3
B211	Beam	4	TRELLIS	TRELLIS		3
B212	Beam	5.1	TRELLIS	TRELLIS		3
B213	Beam	4	TRELLIS	TRELLIS		3
B214	Beam	5.1	TRELLIS	TRELLIS		3
B215	Beam	4	TRELLIS	TRELLIS		3
B216	Beam	5.1	TRELLIS	TRELLIS		3
B217	Beam	4	TRELLIS	TRELLIS		3
B218	Beam	5.1	TRELLIS	TRELLIS		3
B219	Beam	4	TRELLIS	TRELLIS		3
B220	Beam	5.1	TRELLIS	TRELLIS		3
B221	Beam	4	TRELLIS	TRELLIS		3
B222	Beam	5.1	TRELLIS	TRELLIS		3
B223	Beam	4	TRELLIS	TRELLIS		3
B224	Beam	5.1	TRELLIS	TRELLIS		3
B225	Beam	4	TRELLIS	TRELLIS		3
B226	Beam	5.1	TRELLIS	TRELLIS		3
B227	Beam	4	TRELLIS	TRELLIS		3
B228	Beam	5.1	TRELLIS	TRELLIS		3
B229	Beam	4	TRELLIS	TRELLIS		3
B230	Beam	5.1	TRELLIS	TRELLIS		3
B231	Beam	4	TRELLIS	TRELLIS		3
B232	Beam	5.1	TRELLIS	TRELLIS		3
B233	Beam	4	TRELLIS	TRELLIS		3
B234	Beam	5.1	TRELLIS	TRELLIS		3
B235	Beam	4	TRELLIS	TRELLIS		3
B236	Beam	5.3333	TRELLIS	TRELLIS		3
B237	Beam	42.4063	TRELLIS	TRELLIS		3
B238	Beam	5.0729	TRELLIS	TRELLIS		3
B239	Beam	4	TRELLIS	TRELLIS		3
B240	Beam	5.0729	TRELLIS	TRELLIS		3
B241	Beam	4	TRELLIS	TRELLIS		3
B242	Beam	5.0729	TRELLIS	TRELLIS		3
B243	Beam	4	TRELLIS	TRELLIS		3
B244	Beam	5.0729	TRELLIS	TRELLIS		3
B245	Beam	4	TRELLIS	TRELLIS		3
B246	Beam	5.0729	TRELLIS	TRELLIS		3
B247	Beam	4	TRELLIS	TRELLIS		3
B248	Beam	5.0729	TRELLIS	TRELLIS		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
B249	Beam	4	TRELLIS	TRELLIS		3
B250	Beam	5.0729	TRELLIS	TRELLIS		3
B251	Beam	4	TRELLIS	TRELLIS		3
B252	Beam	5.0729	TRELLIS	TRELLIS		3
B253	Beam	4	TRELLIS	TRELLIS		3
B254	Beam	5.0729	TRELLIS	TRELLIS		3
B255	Beam	4	TRELLIS	TRELLIS		3
B256	Beam	5.0729	TRELLIS	TRELLIS		3
B257	Beam	4	TRELLIS	TRELLIS		3
B258	Beam	5.0729	TRELLIS	TRELLIS		3
B259	Beam	4	TRELLIS	TRELLIS		3
B260	Beam	5.0729	TRELLIS	TRELLIS		3
B261	Beam	4	TRELLIS	TRELLIS		3
B262	Beam	5.0729	TRELLIS	TRELLIS		3
B263	Beam	4	TRELLIS	TRELLIS		3
B264	Beam	5.0729	TRELLIS	TRELLIS		3
B265	Beam	4	TRELLIS	TRELLIS		3
B266	Beam	5.0729	TRELLIS	TRELLIS		3
B267	Beam	4	TRELLIS	TRELLIS		3
B268	Beam	5.0729	TRELLIS	TRELLIS		3
B269	Beam	4	TRELLIS	TRELLIS		3
B270	Beam	15.2209	2B-2	2B-2		3
B271	Beam	2.5413	TB-1	TB-1		3
B272	Beam	2.5	TB-1	TB-1		3
B273	Beam	4.0645	TB-1	TB-1		3
B274	Beam	3.2608	TB-1	TB-1		3
B275	Beam	6.4691	TB-1	TB-1		3
B276	Beam	18.1214	2B-5	2B-5		3
B277	Beam	5.9951	CMU-W	N/A		3
B283	Beam	13.4773	2B-26	2B-26		3
B284	Beam	1.9271	CMU-W	N/A		3
B286	Beam	15.1409	2B-18	2B-18		3
W48-W	Beam	8.1177	CMU-W	N/A		3
W66-W	Beam	2.8679	CMU-W	N/A		3
W67-W	Beam	2.6479	CMU-W	N/A		3
W30-W	Beam	19.1562	CMU-W	N/A		3
W37-W	Beam	6.6354	CMU-W	N/A		3
W38-W	Beam	4.5417	CMU-W	N/A		3
W39-W	Beam	6.6354	CMU-W	N/A		3
W40-W	Beam	10.9375	CMU-W	N/A		3
W63-W	Beam	2	CMU-W	N/A		3
W64-W	Beam	3.5625	CMU-W	N/A		3
W42-W	Beam	7.5208	CMU-W	N/A		3
W61-W	Beam	3.6458	CMU-W	N/A		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
W62-W	Beam	3.6458	CMU-W	N/A		3
W44-W	Beam	9.2481	CMU-W	N/A		3
W17-W	Beam	14.9792	CMU-W	N/A		3
W18-W	Beam	8.2396	CMU-W	N/A		3
W14-W	Beam	5.4896	CMU-W	N/A		3
W53-W	Beam	2.2519	CMU-W	N/A		3
W45-W	Beam	6.4354	CMU-W	N/A		3
W46-W	Beam	6.2918	CMU-W	N/A		3
W47-W	Beam	6.4354	CMU-W	N/A		3
W19-W	Beam	6.1667	CMU-W	N/A		3
W24-W	Beam	7.4372	CMU-W	N/A		3
W16-W	Beam	12.4115	CMU-W	N/A		3
W101-W	Beam	0.451	CMU-W	N/A		3
354	Column	11.5	C402	N/A	360	3
355	Column	11.5	C515	N/A	90	3
356	Column	11.5	C514	N/A	90	3
357	Column	11.5	C524	N/A	90	3
358	Column	11.5	C463	N/A	90	3
359	Column	11.5	C406	N/A	180	3
360	Column	11.5	C404	N/A	180	3
361	Column	11.5	C372	N/A	180	3
362	Column	11.5	C403	N/A	180	3
363	Column	11.5	C405	N/A	90	3
364	Column	11.5	C525	N/A	90	3
365	Column	11.5	C526	N/A	90	3
366	Column	11.5	C311	N/A	180	3
367	Column	11.5	C312	N/A	180	3
368	Column	11.5	C207	N/A	270	3
369	Column	11.5	C527	N/A	180	3
370	Column	11.5	C310	N/A	90	3
371	Column	11.5	C308	N/A	180	3
372	Column	11.5	C309	N/A	180	3
373	Column	11.5	C528	N/A	180	3
374	Column	11.5	C229	N/A	180	3
375	Column	11.5	C227	N/A	180	3
376	Column	11.5	C226	N/A	180	3
377	Column	11.5	C529	N/A	90	3
378	Column	11.5	C530	N/A	180	3
379	Column	11.5	C211	N/A	180	3
380	Column	11.5	C154	N/A	180	3
381	Column	11.5	C152	N/A	180	3
382	Column	11.5	C208	N/A	180	3
383	Column	11.5	C209	N/A	180	3
384	Column	11.5	C210	N/A	270	3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
385	Column	11.5	C531	N/A	270	3
386	Column	11.5	C190	N/A	270	3
387	Column	11.5	C189	N/A	270	3
388	Column	11.5	C213	N/A	270	3
389	Column	11.5	C192	N/A	270	3
390	Column	11.5	C165	N/A	270	3
391	Column	11.5	C195	N/A	180	3
392	Column	11.5	C148	N/A	270	3
393	Column	11.5	C188	N/A	270	3
394	Column	11.5	C149	N/A	180	3
395	Column	11.5	C166	N/A	270	3
396	Column	11.5	C159	N/A	270	3
397	Column	11.5	C157	N/A	270	3
398	Column	11.5	C532	N/A	360	3
399	Column	11.5	C144	N/A	360	3
400	Column	11.5	C533	N/A	360	3
401	Column	11.5	C168	N/A	270	3
402	Column	11.5	C534	N/A	270	3
403	Column	11.5	C535	N/A	270	3
404	Column	11.5	C536	N/A	270	3
405	Column	11.5	C171	N/A	270	3
406	Column	11.5	C182	N/A	270	3
407	Column	11.5	C179	N/A	180	3
408	Column	11.5	C181	N/A	360	3
409	Column	11.5	C184	N/A	270	3
410	Column	11.5	C183	N/A	90	3
411	Column	11.5	C186	N/A	90	3
412	Column	11.5	C185	N/A	90	3
413	Column	11.5	C178	N/A	180	3
414	Column	11.5	C193	N/A	180	3
415	Column	11.5	C537	N/A	270	3
416	Column	11.5	C221	N/A	270	3
417	Column	11.5	C220	N/A	270	3
418	Column	11.5	C218	N/A	360	3
419	Column	11.5	C222	N/A	270	3
420	Column	11.5	C196	N/A	90	3
421	Column	11.5	C197	N/A	90	3
422	Column	11.5	C158	N/A	270	3
423	Column	11.5	C143	N/A	270	3
424	Column	11.5	C146	N/A	270	3
425	Column	11.5	C538	N/A	270	3
426	Column	11.5	C162	N/A		3
427	Column	11.5	C174	N/A		3
428	Column	11.5	C176	N/A		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
429	Column	11.5	C180	N/A		3
430	Column	11.5	C539	N/A		3
431	Column	11.5	C540	N/A		3
432	Column	11.5	C206	N/A		3
433	Column	11.5	C205	N/A		3
434	Column	11.5	C201	N/A		3
435	Column	11.5	C198	N/A		3
436	Column	11.5	C661	N/A	180	3
WW1	Null	18.3125		N/A		3
WW2	Null	7.9979		N/A		3
WW3	Null	4.25		N/A		3
WW4	Null	10.5524		N/A		3
WW5	Null	5.0729		N/A		3
WW6	Null	5.0729		N/A		3
WW7	Null	5.3333		N/A		3
WW8	Null	5.0729		N/A		3
WW9	Null	6.5625		N/A		3
WW10	Null	16.6563		N/A		3
WW11	Null	16.3647		N/A		3
WW12	Null	5.0729		N/A		3
WW13	Null	7.1731		N/A		3
WW15	Null	12.3363		N/A		3
WW20	Null	17.4007		N/A		3
WW21	Null	8.8854		N/A		3
WW22	Null	9.4356		N/A		3
WW23	Null	4.0661		N/A		3
WW25	Null	4.7333		N/A		3
WW26	Null	12.5666		N/A		3
WW27	Null	5.0281		N/A		3
WW28	Null	5		N/A		3
WW29	Null	5		N/A		3
WW31	Null	3.9896		N/A		3
WW33	Null	3.9896		N/A		3
WW35	Null	8.2187		N/A		3
WW41	Null	10.9375		N/A		3
WW43	Null	23.1592		N/A		3
WW49	Null	9.5		N/A		3
WW50	Null	2.498		N/A		3
WW51	Null	1.6042		N/A		3
WW52	Null	1.6042		N/A		3
WW54	Null	2.9645		N/A		3
WW55	Null	2.2206		N/A		3
WW56	Null	1.9867		N/A		3
WW57	Null	1.3333		N/A		3

Table 3.2 - Frame Assignments - Summary (continued)

UniqueName	Design Type	Length ft	Analysis Section	Design Section	Axis Angle deg	Min Number Stations
WW58	Null	2.2206		N/A		3
WW59	Null	1.9271		N/A		3
WW60	Null	1.9867		N/A		3
WW65	Null	1.3333		N/A		3
WW68	Null	2.6221		N/A		3
WW69	Null	3.7264		N/A		3
WW70	Null	2		N/A		3
WW71	Null	1.4997		N/A		3
WW72	Null	2.8454		N/A		3
WW73	Null	1.5938		N/A		3
WW74	Null	2.2519		N/A		3
WW99	Null	3		N/A		3
WW100	Null	12.243		N/A		3

3.3 Shell Assignments

Table 3.3 - Area Assignments - Summary

UniqueName	Section Property	Property Type	Modifiers
F1	Slab8	Slab	
F12	Slab8	Slab	
F9	Slab9	Slab	
F4	Slab8	Slab	
F5	Slab8	Slab	
F6	Slab8	Slab	
F7	Slab8	Slab	
F10	Slab8	Slab	
F11	Slab8	Slab	
F8	Slab8	Slab	
ColC402	Col_{Stiff}	Slab	
ColC515	Col_{Stiff}	Slab	
ColC514	Col_{Stiff}	Slab	
ColC524	Col_{Stiff}	Slab	
ColC463	Col_{Stiff}	Slab	
ColC406	Col_{Stiff}	Slab	
ColC404	Col_{Stiff}	Slab	
ColC372	Col_{Stiff}	Slab	
ColC403	Col_{Stiff}	Slab	
ColC405	Col_{Stiff}	Slab	
ColC525	Col_{Stiff}	Slab	
ColC526	Col_{Stiff}	Slab	
ColC311	Col_{Stiff}	Slab	
ColC312	Col_{Stiff}	Slab	
ColC207	Col_{Stiff}	Slab	
ColC527	Col_{Stiff}	Slab	

Table 3.3 - Area Assignments - Summary (continued)

UniqueName	Section Property	Property Type	Modifiers
ColC310	Col_{Stiff}	Slab	
ColC308	Col_{Stiff}	Slab	
ColC309	Col_{Stiff}	Slab	
ColC528	Col_{Stiff}	Slab	
ColC229	Col_{Stiff}	Slab	
ColC227	Col_{Stiff}	Slab	
ColC226	Col_{Stiff}	Slab	
ColC529	Col_{Stiff}	Slab	
ColC530	Col_{Stiff}	Slab	
ColC211	Col_{Stiff}	Slab	
ColC154	Col_{Stiff}	Slab	
ColC152	Col_{Stiff}	Slab	
ColC208	Col_{Stiff}	Slab	
ColC209	Col_{Stiff}	Slab	
ColC210	Col_{Stiff}	Slab	
ColC531	Col_{Stiff}	Slab	
ColC190	Col_{Stiff}	Slab	
ColC189	Col_{Stiff}	Slab	
ColC213	Col_{Stiff}	Slab	
ColC192	Col_{Stiff}	Slab	
ColC165	Col_{Stiff}	Slab	
ColC195	Col_{Stiff}	Slab	
ColC148	Col_{Stiff}	Slab	
ColC188	Col_{Stiff}	Slab	
ColC149	Col_{Stiff}	Slab	
ColC166	Col_{Stiff}	Slab	
ColC159	Col_{Stiff}	Slab	
ColC157	Col_{Stiff}	Slab	
ColC532	Col_{Stiff}	Slab	
ColC144	Col_{Stiff}	Slab	
ColC533	Col_{Stiff}	Slab	
ColC168	Col_{Stiff}	Slab	
ColC534	Col_{Stiff}	Slab	
ColC535	Col_{Stiff}	Slab	
ColC536	Col_{Stiff}	Slab	
ColC171	Col_{Stiff}	Slab	
ColC182	Col_{Stiff}	Slab	
ColC179	Col_{Stiff}	Slab	
ColC181	Col_{Stiff}	Slab	
ColC184	Col_{Stiff}	Slab	
ColC183	Col_{Stiff}	Slab	
ColC186	Col_{Stiff}	Slab	
ColC185	Col_{Stiff}	Slab	
ColC178	Col_{Stiff}	Slab	
ColC193	Col_{Stiff}	Slab	

Table 3.3 - Area Assignments - Summary (continued)

UniqueName	Section Property	Property Type	Modifiers
ColC537	Col_{Stiff}	Slab	
ColC221	Col_{Stiff}	Slab	
ColC220	Col_{Stiff}	Slab	
ColC218	Col_{Stiff}	Slab	
ColC222	Col_{Stiff}	Slab	
ColC196	Col_{Stiff}	Slab	
ColC197	Col_{Stiff}	Slab	
ColC158	Col_{Stiff}	Slab	
ColC143	Col_{Stiff}	Slab	
ColC146	Col_{Stiff}	Slab	
ColC538	Col_{Stiff}	Slab	
ColC162	Col_{Stiff}	Slab	
ColC174	Col_{Stiff}	Slab	
ColC176	Col_{Stiff}	Slab	
ColC180	Col_{Stiff}	Slab	
ColC539	Col_{Stiff}	Slab	
ColC540	Col_{Stiff}	Slab	
ColC206	Col_{Stiff}	Slab	
ColC205	Col_{Stiff}	Slab	
ColC201	Col_{Stiff}	Slab	
ColC198	Col_{Stiff}	Slab	
ColC661	Col_{Stiff}	Slab	
95	WW1	Wall	Yes
96	WW2	Wall	Yes
97	WW3	Wall	Yes
98	WW4	Wall	Yes
99	WW5	Wall	Yes
100	WW6	Wall	Yes
101	WW7	Wall	Yes
102	WW8	Wall	Yes
103	WW9	Wall	Yes
104	WW10	Wall	Yes
105	WW11	Wall	Yes
106	WW12	Wall	Yes
107	WW13	Wall	Yes
108	WW14	Wall	Yes
109	WW15	Wall	Yes
110	WW17	Wall	Yes
111	WW18	Wall	Yes
112	WW19	Wall	Yes
113	WW20	Wall	Yes
114	WW21	Wall	Yes
115	WW22	Wall	Yes
116	WW23	Wall	Yes
117	WW24	Wall	Yes

Table 3.3 - Area Assignments - Summary (continued)

UniqueName	Section Property	Property Type	Modifiers
118	WW25	Wall	Yes
119	WW26	Wall	Yes
120	WW27	Wall	Yes
121	WW28	Wall	Yes
122	WW29	Wall	Yes
123	WW30	Wall	Yes
124	WW31	Wall	Yes
125	WW33	Wall	Yes
126	WW35	Wall	Yes
127	WW36	Wall	Yes
128	WW37	Wall	Yes
129	WW38	Wall	Yes
130	WW39	Wall	Yes
131	WW40	Wall	Yes
132	WW41	Wall	Yes
133	WW42	Wall	Yes
134	WW43	Wall	Yes
135	WW44	Wall	Yes
136	WW45	Wall	Yes
137	WW46	Wall	Yes
138	WW47	Wall	Yes
139	WW48	Wall	Yes
140	WW49	Wall	Yes
141	WW50	Wall	Yes
142	WW51	Wall	Yes
143	WW52	Wall	Yes
144	WW53	Wall	Yes
145	WW54	Wall	Yes
146	WW55	Wall	Yes
147	WW56	Wall	Yes
148	WW57	Wall	Yes
149	WW58	Wall	Yes
150	WW59	Wall	Yes
151	WW60	Wall	Yes
152	WW61	Wall	Yes
153	WW62	Wall	Yes
154	WW63	Wall	Yes
155	WW64	Wall	Yes
156	WW65	Wall	Yes
157	WW66	Wall	Yes
158	WW67	Wall	Yes
159	WW68	Wall	Yes
160	WW69	Wall	Yes
161	WW70	Wall	Yes
162	WW71	Wall	Yes

Table 3.3 - Area Assignments - Summary (continued)

UniqueName	Section Property	Property Type	Modifiers
163	WW72	Wall	Yes
164	WW73	Wall	Yes
165	WW74	Wall	Yes
166	WW99	Wall	Yes
167	WW100	Wall	Yes
A2	None	Opening	

4 Loads

This chapter provides loading information as applied to the model.

4.1 Load Patterns

Table 4.1 - Load Pattern Definitions

Name	Is Auto Load	Type	Self Weight Multiplier
~LLRF	No	Other	0
Dead	No	Dead	1
Dead $_{ABOVE}$	No	Dead	0
Live	No	Live	0
Live $_{ABOVE}$	No	Live	0
SD	No	Super Dead	0
SD $_{ABOVE}$	No	Super Dead	0

4.2 Applied Loads

4.2.1 Point Loads

Table 4.2 - Joint Loads Assignments - Force

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
143	Dead $_{ABOVE}$	1.097	0.419	-17.638	-1.4306	-2.8889	0.0012	0	0
144	Dead $_{ABOVE}$	2.835	1.142	-10.892	-4.7791	0.61	0.0049	0	0
145	Dead $_{ABOVE}$	-1.006	7.115	-2.394	-1.0333	1.6759	-0.0249	0	0
146	Dead $_{ABOVE}$	-4.448	1.222	-24.621	-3.8235	0.2492	0.201	8	16
147	Dead $_{ABOVE}$	1.367	-1.214	2.405	-18.2501	4.8175	0.0057	0	0
148	Dead $_{ABOVE}$	-3.198	-0.659	-32.956	2.315	-7.0572	0.0005	0	0
149	Dead $_{ABOVE}$	1.145	1.645	-21.527	-2.9078	4.5108	0.0064	0	0
150	Dead $_{ABOVE}$	1.517	-0.099	4.136	0.2926	0.5159	-0.0007	0	0
151	Dead $_{ABOVE}$	1.076	-0.156	2.254	0.2807	0.1436	-0.0901	0	0
155	Dead $_{ABOVE}$	0.084	-4.473	-8.949	16.8607	0.4691	0.0631	8	24
156	Dead $_{ABOVE}$	0.113	6.887	11.999	-8.356	1.8907	-0.5196	8	16
162	Dead $_{ABOVE}$	5.437	-0.468	1.128	1.5647	0.8921	0.0007	0	0
163	Dead $_{ABOVE}$	6.292	-0.328	-2.389	1.3786	1.9707	0.2484	12	8
164	Dead $_{ABOVE}$	4.479	0.343	-19.079	-6.3613	-0.9045	0.0117	0	0
165	Dead $_{ABOVE}$	-0.038	-1.765	-23.156	-0.5291	-0.3441	-0.0053	0	0
167	Dead $_{ABOVE}$	0.123	9.136E-05	-14.907	0.0195	0.6436	0.0002	0	0
168	Dead $_{ABOVE}$	1.435	0.796	-8.49	-4.7031	0.7485	-0.0713	8	16
170	Dead $_{ABOVE}$	7.126	-0.729	-32.138	5.5345	4.9132	0.4354	8	12
172	Dead $_{ABOVE}$	-5.059	-3.503	-1.63	4.7183	-8.2308	0.0322	24	8
173	Dead $_{ABOVE}$	3.547	-0.814	-0.568	3.9319	0.6487	-0.0004	0	0
174	Dead $_{ABOVE}$	-0.34	-2.662	-16.172	0.0229	-1.038	0.0052	0	0
175	Dead $_{ABOVE}$	-0.33	-1.999	-9.81	5.6716	-1.8173	0.1911	8	16
177	Dead $_{ABOVE}$	0.233	0.02	-14.628	-1.0974	1.4434	0.0041	8	24
179	Dead $_{ABOVE}$	0.35	1.719	-21.362	3.5875	0.8173	0.069	16	8
183	Dead $_{ABOVE}$	1.247	-0.225	-9.061	1.3526	-1.0049	0.0415	8	12

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
184	$Dead_{ABOVE}$	-0.41	2.584	-16.005	-6.8263	-1.8351	0.1525	8	24
185	$Dead_{ABOVE}$	0.559	-0.072	-9.419	0.1771	0.0522	0.0115	8	16
186	$Dead_{ABOVE}$	0.188	0.507	-21.324	-0.1208	0.2066	-0.0755	8	60
191	$Dead_{ABOVE}$	0.261	4.219	12.565	-0.8219	2.754	-0.3612	8	16
192	$Dead_{ABOVE}$	0.114	5.339	-24.929	-3.5176	1.193	0.0018	0	0
193	$Dead_{ABOVE}$	-0.396	-0.076	-4.719	0.1535	1.0388	-0.0247	0	0
194	$Dead_{ABOVE}$	-0.174	2.093	-16.362	0.7346	-0.4913	0.0031	0	0
196	$Dead_{ABOVE}$	0.025	0.353	-5.771	0.435	0.1088	0.0025	8	16
197	$Dead_{ABOVE}$	-0.02	1.376	-10.278	-0.3033	0.1324	0.0019	8	16
198	$Dead_{ABOVE}$	3.237	1.998	6.649	-0.7878	18.1057	-0.261	24	8
200	$Dead_{ABOVE}$	0.002	0.136	-9.52	-0.6925	0.0082	0.0002	0	0
203	$Dead_{ABOVE}$	-0.006	0.023	-3.406	-0.1156	-0.0135	0.0002	0	0
204	$Dead_{ABOVE}$	1	0.556	-8.114	-2.335	2.5144	-0.0982	16	8
205	$Dead_{ABOVE}$	0.217	0.205	-11.501	-0.9006	-0.8199	0.0036	0	0
206	$Dead_{ABOVE}$	-6.037	0.566	-6.348	-2.8029	-1.3885	-0.0012	0	0
207	$Dead_{ABOVE}$	-8.573	5.464	-42.398	0.3334	-0.8596	-0.0303	0	0
214	$Dead_{ABOVE}$	-0.512	0.088	-4.098	-0.7089	-0.1361	0.0525	0	0
215	$Dead_{ABOVE}$	3.947	-0.044	-6.255	0.012	0.422	-0.024	0	0
216	$Dead_{ABOVE}$	0.625	0.269	-4.643	-1.2166	0.2953	-0.1994	0	0
217	$Dead_{ABOVE}$	0.105	0.153	-2.488	-0.7118	0.8167	0.1217	0	0
219	$Dead_{ABOVE}$	5.978	-0.378	-19.244	3.3846	10.464	0.1251	8	12
222	$Dead_{ABOVE}$	-6.933	-0.861	-20.763	1.8896	-0.6825	0.0296	0	0
223	$Dead_{ABOVE}$	0.734	-1.98	-8.272	0.6295	4.476	-0.0067	0	0
224	$Dead_{ABOVE}$	-0.113	1.16	-3.884	-0.1481	-0.8862	-0.1124	0	0
225	$Dead_{ABOVE}$	-0.122	-1.711	-14.425	9.1883	-1.0249	0.0024	16	8
226	$Dead_{ABOVE}$	1.296	-2.28	-9.62	3.5362	7.9425	-0.1831	16	8
228	$Dead_{ABOVE}$	0.046	-1.35	-11.381	6.96	0.2859	0.0024	16	8
308	$Dead_{ABOVE}$	-0.3	-0.54	-11.419	2.451	-2.1357	0.0024	16	8
309	$Dead_{ABOVE}$	0.16	-3.026	-12.063	1.7031	2.6645	0.1307	16	8
310	$Dead_{ABOVE}$	-0.178	-10.185	-23.803	1.8248	-1.0259	-0.0024	0	0
527	$Dead_{ABOVE}$	-0.019	-5.033	-31.868	0.1503	-0.4609	0.2005	16	8
528	$Dead_{ABOVE}$	-0.627	-5.401	-22.398	1.6214	-1.7746	0.0879	16	8
531	$Dead_{ABOVE}$	0.037	1.136	-24.93	-0.1892	1.0623	0.4134	8	24
532	$Dead_{ABOVE}$	-1.309	0.735	-9.419	-4.4653	0.4428	-0.005	0	0
533	$Dead_{ABOVE}$	-0.399	0.782	-9.538	-4.7185	-0.6881	0.006	0	0
537	$Dead_{ABOVE}$	0.239	2.42	-17.263	4.8279	0.3478	0.0004	0	0
538	$Dead_{ABOVE}$	-0.715	0.403	-15.036	-0.8345	-0.4116	0.098	8	16
539	$Dead_{ABOVE}$	2.052	1.55	-15.811	-6.9458	0.8776	-0.3856	16	8
540	$Dead_{ABOVE}$	-1.187	1.359	-11.284	-4.9697	-0.7487	0.2581	16	8
553	$Dead_{ABOVE}$	0.773	4.146	9.628	-7.7204	3.3688	-0.2587	8	16
561	$Dead_{ABOVE}$	0.006	-0.222	-8.808	1.1866	0.0428	0.0002	0	0
575	$Dead_{ABOVE}$	-0.08	-0.065	-13.79	0.0301	-0.5552	0	12	12
576	$Dead_{ABOVE}$	0.075	-0.073	-20.7	0.3583	0.5145	0.0002	12	12
580	$Dead_{ABOVE}$	-2.315	0.18	1.342	-4.9977	-0.3738	-0.2701	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
581	$Dead_{ABOVE}$	0.88	1.418	-10.108	-0.2037	0.1653	-0.0008	0	0
582	$Dead_{ABOVE}$	-8.664E-05	0.097	0.317	-0.0341	0.2883	-2.831E-05	0	0
588	$Dead_{ABOVE}$	0.061	-2.113	-0.841	0.7355	-1.5087	0.1365	0	0
589	$Dead_{ABOVE}$	0.769	-2.542	-0.79	6.2745	-4.8097	0.0575	0	0
592	$Dead_{ABOVE}$	-2.813E-05	-0.099	0.481	-0.1926	-0.2747	2.318E-05	0	0
597	$Dead_{ABOVE}$	0.149	1.095	-5.418	0.1134	1.2455	0.189	0	0
599	$Dead_{ABOVE}$	-1.353	-0.022	-6.537	-0.3925	-0.8208	0.011	0	0
600	$Dead_{ABOVE}$	-1.961	1.653	-1.588	-4.6057	-3.7921	0.0191	0	0
604	$Dead_{ABOVE}$	0.027	0.011	-1.675	0.0056	0.005	-0.0008	0	0
661	$Dead_{ABOVE}$	-0.096	0.289	-37.369	-1.3531	-0.3922	0.0007	0	0
664	$Dead_{ABOVE}$	0.526	0.708	0.675	-3.0888	-0.4046	0.1339	16	8
663	$Dead_{ABOVE}$	-0.173	0.128	-0.496	4.5386	0.5298	0.0673	0	0
666	$Dead_{ABOVE}$	-0.198	0.159	-0.848	5.2946	-0.5722	-0.0779	0	0
P1563	$Dead_{ABOVE}$	-3.842	0.136	-10.4	6.6161	-0.5369	0.0018	0	0
P1564	$Dead_{ABOVE}$	-2.191	0.204	-8.982	4.3552	-0.4865	-0.0328	0	0
P1565	$Dead_{ABOVE}$	1.274	0.854	-5.464	-3.9935	0.1743	0.0203	0	0
P1566	$Dead_{ABOVE}$	0.72	1.09	-5.585	-5.4207	0.1906	-0.0026	0	0
P1567	$Dead_{ABOVE}$	-0.24	1.277	-5.902	-5.7659	-0.1081	-0.0071	0	0
P1568	$Dead_{ABOVE}$	-0.949	1.09	-7.066	-4.5893	-0.2024	-0.0109	0	0
P1569	$Dead_{ABOVE}$	0.244	11.251	-0.987	-1.9015	0.3225	-0.0148	0	0
P1570	$Dead_{ABOVE}$	0.132	8.923	0.846	-0.9912	0.8046	-0.0057	0	0
P1571	$Dead_{ABOVE}$	1.81	0.016	0.302	-0.4789	0.2973	0.0051	0	0
P1572	$Dead_{ABOVE}$	3.495	0.105	-2.046	-0.5168	1.0184	0.0066	0	0
P1573	$Dead_{ABOVE}$	-0.516	0.727	-2.255	-2.8059	0.2041	-0.0054	0	0
P1574	$Dead_{ABOVE}$	2.134	1.017	-0.428	-4.2396	0.0951	-0.0063	0	0
P1575	$Dead_{ABOVE}$	-0.447	0.467	-0.54	-9.1905	-0.0873	-0.0018	0	0
P1576	$Dead_{ABOVE}$	6.938	-0.436	-1.893	2.4935	1.1077	-0.0043	0	0
P1577	$Dead_{ABOVE}$	4.283	-0.494	1.376	2.8266	-0.0057	-0.0008	0	0
P1578	$Dead_{ABOVE}$	2.011	-0.804	6.06	4.1387	0.6184	-0.0083	0	0
P1579	$Dead_{ABOVE}$	-2.396	-0.716	8.663	3.1899	-0.3763	0.0167	0	0
P1580	$Dead_{ABOVE}$	3.592	-0.439	-8.045	1.5901	0.5361	-0.0032	0	0
P1581	$Dead_{ABOVE}$	-0.493	-1.863	-4.567	0.1255	0.1076	0.0012	0	0
P1582	$Dead_{ABOVE}$	1.077	-0.011	-6.019	0.0505	0.1487	0.001	0	0
P1583	$Dead_{ABOVE}$	2.421	-0.049	-6.442	0.0426	0.3984	-0.0001	0	0
P1584	$Dead_{ABOVE}$	0.831	-0.052	-6.688	0.0896	0.0483	0.0003	0	0
P1585	$Dead_{ABOVE}$	0.263	0.589	-10.876	-0.2165	-5.7358	-0.0071	0	0
P1586	$Dead_{ABOVE}$	3.446	-0.652	0.694	3.5455	0.4882	-0.014	0	0
P1587	$Dead_{ABOVE}$	-0.486	-0.763	3.041	4.3147	-0.3056	0.0021	0	0
P1588	$Dead_{ABOVE}$	-2.838	-0.731	2.779	4.1625	0.0334	0.0008	0	0
P1589	$Dead_{ABOVE}$	-5.487	-0.609	2.281	3.4687	-0.5054	-0.0039	0	0
P1590	$Dead_{ABOVE}$	-8.511	-0.47	-1.399	2.1986	-1.4201	0.0214	0	0
P1591	$Dead_{ABOVE}$	-0.43	1.655	-7.525	-0.1221	-1.9843	0.0103	0	0
P1592	$Dead_{ABOVE}$	-0.359	2.131	-9.844	-0.0874	-1.4664	-0.0162	0	0
P1593	$Dead_{ABOVE}$	1.567	-2.63	-10.049	0.7625	7.3749	-0.0071	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
P1594	Dead ABOVE	1.244	-2.517	-8.752	0.6912	6.4755	0.0058	0	0
P1595	Dead ABOVE	0.924	-2.16	-7.853	0.495	4.5548	0.0183	0	0
P1596	Dead ABOVE	0.577	0.106	-8.229	-0.0272	2.8876	-0.0081	0	0
P1597	Dead ABOVE	0.666	-0.793	-7.552	0.2263	3.3629	0.0026	0	0
P1598	Dead ABOVE	-0.077	-5.62	-9.643	1.1831	7.5504	0.0049	0	0
P1599	Dead ABOVE	-0.377	-11.562	-2.313	1.3992	-1.5446	0.0011	0	0
P1600	Dead ABOVE	-0.526	-7.59	0.966	0.7256	-1.1031	-0.0056	0	0
P1601	Dead ABOVE	-0.532	-4.633	0.959	0.2868	-1.4141	-0.0101	0	0
P1602	Dead ABOVE	-0.419	-1.938	1.082	-0.4261	-4.816	-0.0122	0	0
P1603	Dead ABOVE	-0.293	1.496	-1.473	-2.823	-5.9145	0.0011	0	0
P1604	Dead ABOVE	-0.002	0.415	-5.059	0.0225	0.3859	0.0041	0	0
P1605	Dead ABOVE	-1.501	0.422	-5.895	-1.283	-0.0178	0.0023	0	0
P1606	Dead ABOVE	-0.221	1.139	-7.209	-0.0255	7.8011	-0.0042	0	0
P1607	Dead ABOVE	-8.906	0.183	-4.53	-1.2498	-2.1933	-0.0043	0	0
P1608	Dead ABOVE	-6.379	0.352	1.229	-1.9696	-1.3545	0.003	0	0
P1609	Dead ABOVE	-0.046	0.218	-12.413	0.214	0.0212	0.0072	0	0
P1610	Dead ABOVE	-0.031	0.859	-18.971	-0.0228	0.324	-0.0123	0	0
P1611	Dead ABOVE	0.147	6.289	-1.455	1.9694	1.3792	0.0014	0	0
P1612	Dead ABOVE	2.254	-0.113	-0.643	-0.3846	-0.1567	-0.0048	0	0
P1613	Dead ABOVE	-7.643	-0.732	-8.523	2.6249	1.1853	-0.0055	0	0
P1614	Dead ABOVE	-4.996	-0.688	2.996	2.3173	-0.2249	-0.0026	0	0
P1615	Dead ABOVE	-0.461	-0.676	7.553	2.1948	0.1341	0.0015	0	0
P1616	Dead ABOVE	3.628	-0.637	7.328	2.1065	0.3289	0.0016	0	0
P1617	Dead ABOVE	5.635	0.111	-6.267	0.0061	-1.1931	0.0007	0	0
P1618	Dead ABOVE	3.548	0.226	-2.611	-0.3322	0.2036	-0.0078	0	0
P1619	Dead ABOVE	3.384	-0.289	-10.738	1.0228	-1.8722	0.003	0	0
P1620	Dead ABOVE	-0.033	3.415	-0.959	-0.8913	0.172	-0.0104	0	0
P1621	Dead ABOVE	-6.243	0.739	2.304	-3.4595	-1.4554	-0.0011	0	0
P1622	Dead ABOVE	-3.65	0.723	3.512	-3.3859	-0.3346	0.0012	0	0
P1623	Dead ABOVE	-0.822	0.706	1.912	-2.948	-0.038	0.0058	0	0
P1624	Dead ABOVE	-0.754	0.002	1.086	-10.5805	0.0548	-0.0004	0	0
P1625	Dead ABOVE	0.004	0.474	0.524	0.0724	5.9109	0.0008	0	0
P1626	Dead ABOVE	0.0001875	0.091	0.888	-0.1318	2.4925	-0.0001	0	0
P1627	Dead ABOVE	-0.002	-1.104	1.137	-0.1786	-8.1702	-0.0003	0	0
P1628	Dead ABOVE	-0.001	-0.848	2.917	-4.6423	0.5494	0.0007	0	0
P1629	Dead ABOVE	-0.007	-2.827	4.445	0.2363	-0.0728	0.0022	0	0
P1630	Dead ABOVE	-0.026	-2.384	5.996	0.1085	-1.1485	-0.0038	0	0
P1631	Dead ABOVE	-0.047	-1.508	6.05	-1.6513	-0.5528	-0.0217	0	0
P1632	Dead ABOVE	-0.019	-0.393	6.019	-2.5617	3.8896	-0.0081	0	0
P1633	Dead ABOVE	-0.01	0.384	0.934	3.4537	4.3435	-0.0045	0	0
P1634	Dead ABOVE	-0.001	-0.045	0.092	-0.0441	-0.361	-0.0001	0	0
P1635	Dead ABOVE	-2.478E-05	-0.005	-0.126	-0.0527	-0.2465	1.593E-05	0	0
P1636	Dead ABOVE	-0.005	0.359	0.155	0.0631	-7.8874	-0.0007	0	0
P1637	Dead ABOVE	-9.061E-05	0.037	0.58	0.2758	-2.5501	0.0001	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
143	$Live_{ABOVE}$	0.04	0.121	-3.475	-0.4442	-0.6418	-8.354E-06	0	0
144	$Live_{ABOVE}$	0.327	0.376	-1.639	-1.6629	0.0555	0.0021	0	0
145	$Live_{ABOVE}$	-0.166	1.844	-0.728	-0.3304	0.8336	-0.0008	0	0
146	$Live_{ABOVE}$	-1.133	0.527	-5.616	-1.5642	-0.02	0.0905	8	16
147	$Live_{ABOVE}$	0.184	-0.632	-0.783	-1.4972	1.1934	0.0001	0	0
148	$Live_{ABOVE}$	-0.962	-0.173	-6.641	0.6303	-1.5165	-0.0005	0	0
149	$Live_{ABOVE}$	0.128	0.064	-5.845	-0.0011	0.605	0.0013	0	0
150	$Live_{ABOVE}$	0.383	-0.217	1.107	0.9383	0.0642	0.0022	0	0
151	$Live_{ABOVE}$	0.369	0.02	1.037	0.3597	-0.0592	-0.106	0	0
155	$Live_{ABOVE}$	0.293	-1.672	2.771	6.4632	0.7122	0.0542	8	24
156	$Live_{ABOVE}$	0.113	2.732	6.371	-4.3098	1.1789	-0.2605	8	16
162	$Live_{ABOVE}$	0.915	-0.159	0.618	0.5937	0.0174	-0.0001	0	0
163	$Live_{ABOVE}$	1.117	-0.117	-0.33	0.5556	0.1533	0.0622	12	8
164	$Live_{ABOVE}$	0.713	-0.057	-3.243	-0.8981	-0.2613	0.0049	0	0
165	$Live_{ABOVE}$	-0.068	-0.402	-4.335	-0.0909	-0.3203	0.0003	0	0
167	$Live_{ABOVE}$	0.04	0.001	-3.488	0.0024	0.2169	0.0001	0	0
168	$Live_{ABOVE}$	0.241	0.201	-0.763	-1.3992	0.2163	-0.0019	8	16
170	$Live_{ABOVE}$	2.75	-0.209	-11.911	1.7303	1.8311	0.1848	8	12
172	$Live_{ABOVE}$	-2.165	-0.803	-1.981	0.4253	-4.1637	0.0582	24	8
173	$Live_{ABOVE}$	2.834	-0.139	0.91	0.4131	0.8275	0.0052	0	0
174	$Live_{ABOVE}$	-0.336	-0.527	-5.35	0.0225	-0.9532	0.0099	0	0
175	$Live_{ABOVE}$	-0.391	0.671	3.975	-1.4157	-2.1765	0.3504	8	16
177	$Live_{ABOVE}$	0.04	-0.597	-2.192	4.3865	0.2067	0.0011	8	24
179	$Live_{ABOVE}$	0.113	-0.628	-3.089	6.7077	0.3518	0.0194	16	8
183	$Live_{ABOVE}$	0.313	-0.044	-2.114	0.2721	-0.3334	0.0214	8	12
184	$Live_{ABOVE}$	-0.111	0.761	-4.423	-1.5574	-0.4602	0.0326	8	24
185	$Live_{ABOVE}$	0.11	-0.025	-0.956	0.0555	0.0049	0.0053	8	16
186	$Live_{ABOVE}$	0.059	0.221	-3.331	0.2553	0.0395	-0.0234	8	60
191	$Live_{ABOVE}$	0.066	0.988	3.58	-0.2723	0.7576	-0.1107	8	16
192	$Live_{ABOVE}$	0.005	1.045	-4.917	-0.808	0.2125	0.0006	0	0
193	$Live_{ABOVE}$	-0.037	-0.025	-0.787	0.0547	0.1829	-0.0095	0	0
194	$Live_{ABOVE}$	-0.049	0.318	-3	0.1811	-0.1571	0.001	0	0
196	$Live_{ABOVE}$	0.005	0.007	-0.528	0.2096	0.0282	0.0016	8	16
197	$Live_{ABOVE}$	-0.008	0.208	-1.673	0.0137	0.0388	-0.0021	8	16
198	$Live_{ABOVE}$	0.759	0.617	2.302	-0.7362	4.2605	-0.0649	24	8
200	$Live_{ABOVE}$	-0.001	0.044	-2.117	-0.225	-0.0034	0.0001	0	0
203	$Live_{ABOVE}$	-0.002	0.008	-0.344	-0.0351	-0.0092	0.0001	0	0
204	$Live_{ABOVE}$	0.274	0.148	-1.689	-0.6218	0.5021	-0.0143	16	8
205	$Live_{ABOVE}$	0.102	0.05	-2.227	-0.2439	-0.1955	0.0011	0	0
206	$Live_{ABOVE}$	-1.266	0.175	-0.484	-0.8884	-0.3353	-0.0005	0	0
207	$Live_{ABOVE}$	-1.782	1.126	-8.366	0.0479	-0.2603	-0.0086	0	0
214	$Live_{ABOVE}$	-0.097	0.028	-0.636	-0.2473	-0.0437	0.017	0	0
215	$Live_{ABOVE}$	0.772	-0.022	-0.881	0.0322	0.0877	-0.0067	0	0
216	$Live_{ABOVE}$	0.095	0.093	-0.705	-0.442	0.0645	-0.0737	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
217	Live ABOVE	0.041	0.057	-0.29	-0.2609	0.2007	0.0454	0	0
219	Live ABOVE	1.219	-0.085	-3.394	0.7906	2.2226	0.0272	8	12
222	Live ABOVE	-1.63	-0.127	-4.267	0.4397	-0.1838	0.0072	0	0
223	Live ABOVE	0.233	-0.701	-1.312	0.2481	1.5637	-0.0033	0	0
224	Live ABOVE	-0.039	0.187	-0.53	0.0229	-0.3288	-0.0439	0	0
225	Live ABOVE	-0.03	-0.598	-3.121	3.4239	-0.2662	0.0006	16	8
226	Live ABOVE	0.278	-0.759	-1.913	1.4538	1.8807	0.0073	16	8
228	Live ABOVE	-0.013	-0.477	-2.36	2.6446	-0.0567	0.0006	16	8
308	Live ABOVE	-0.091	-0.17	-2.007	0.8363	-0.6616	0.0006	16	8
309	Live ABOVE	0.024	-0.943	-1.9	0.6871	0.8005	0.0501	16	8
310	Live ABOVE	-0.08	-2.187	-4.744	0.3443	-0.0586	-0.0015	0	0
527	Live ABOVE	0.002	-1.045	-6.267	0.0155	-0.1513	0.0336	16	8
528	Live ABOVE	-0.159	-1.355	-4.948	0.3939	-0.2878	0.0403	16	8
531	Live ABOVE	0.003	0.052	-4.013	0.1805	0.2933	0.1267	8	24
532	Live ABOVE	-0.348	0.216	-1.799	-1.3626	0.0602	-0.0011	0	0
533	Live ABOVE	-0.369	0.228	-1.406	-1.4431	-0.1304	0.0017	0	0
537	Live ABOVE	0.06	0.709	-3.621	1.2947	-0.0346	-0.0001	0	0
538	Live ABOVE	-0.222	0.186	-3.457	-0.2689	-0.1048	0.0744	8	16
539	Live ABOVE	0.238	0.493	-2.292	-2.3814	0.0635	-0.1454	16	8
540	Live ABOVE	-0.297	0.43	-2.335	-1.6073	-0.212	0.0965	16	8
553	Live ABOVE	0.245	1.189	3.567	-2.1868	1.0706	-0.0912	8	16
561	Live ABOVE	0.001	-0.077	-2.115	0.4337	0.0074	0.0001	0	0
575	Live ABOVE	-0.027	-0.02	-3.833	0.0954	-0.1874	0.0001	12	12
576	Live ABOVE	0.025	-0.025	-5.552	0.1236	0.1728	0.0001	12	12
580	Live ABOVE	-0.561	0.058	0.786	-2.6731	-0.1967	-0.0822	0	0
581	Live ABOVE	0.176	0.359	-1.874	-0.0395	0.0354	0.0005	0	0
582	Live ABOVE	-3.122E-05	0.021	0.111	-0.0202	0.1192	-1.188E-05	0	0
588	Live ABOVE	0.013	-0.525	-0.245	0.2196	-0.4552	0.0284	0	0
589	Live ABOVE	0.023	-0.756	0.647	1.8329	-1.4758	0.0121	0	0
592	Live ABOVE	0	-0.027	0.171	-0.0919	-0.3423	2.053E-06	0	0
597	Live ABOVE	0.041	0.178	-0.971	0.027	0.3748	0.0552	0	0
599	Live ABOVE	-0.391	0.055	-1.321	-0.1208	-0.3155	0.004	0	0
600	Live ABOVE	-0.866	0.627	0.863	-1.6959	-1.4489	0.009	0	0
604	Live ABOVE	0.013	0.003	-0.156	0.0027	0.0007	-0.0002	0	0
661	Live ABOVE	-0.033	0.108	-10.634	-0.5528	-0.1386	0.0002	0	0
664	Live ABOVE	0.231	0.204	0.576	-0.896	-0.0869	0.0519	16	8
663	Live ABOVE	-0.087	0.039	-0.181	1.4087	0.1166	0.0204	0	0
666	Live ABOVE	-0.099	0.048	-0.291	1.6455	-0.1239	-0.0236	0	0
P1563	Live ABOVE	-1.006	0.074	-2.32	3.4251	-0.1725	0.0015	0	0
P1564	Live ABOVE	-0.605	0.08	-1.997	2.3051	-0.1453	-0.0094	0	0
P1565	Live ABOVE	0.183	0.281	-0.293	-1.3662	0.0241	0.0078	0	0
P1566	Live ABOVE	0.03	0.362	-0.367	-1.8937	0.038	-0.0006	0	0
P1567	Live ABOVE	-0.264	0.421	-0.529	-1.9971	-0.04	-0.0027	0	0
P1568	Live ABOVE	-0.467	0.348	-0.939	-1.5271	-0.0846	-0.0044	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
P1569	$Live_{ABOVE}$	0.129	3.031	-0.205	-0.4779	0.2475	-0.0073	0	0
P1570	$Live_{ABOVE}$	0.08	2.759	0.316	-0.2243	0.5032	-0.0024	0	0
P1571	$Live_{ABOVE}$	0.386	-0.016	-0.12	-0.0825	0.0581	0.0021	0	0
P1572	$Live_{ABOVE}$	0.616	0.023	-0.539	-0.1179	0.1927	0.0019	0	0
P1573	$Live_{ABOVE}$	-0.367	0.239	-0.349	-0.9856	-0.0282	-0.0023	0	0
P1574	$Live_{ABOVE}$	0.121	0.341	0.213	-1.5085	-0.0615	-0.002	0	0
P1575	$Live_{ABOVE}$	-0.224	0.141	-0.1	-2.8268	-0.0503	-0.0004	0	0
P1576	$Live_{ABOVE}$	2.972	-0.13	-0.908	0.7101	0.4496	-0.0009	0	0
P1577	$Live_{ABOVE}$	2.458	-0.152	0.405	0.6412	0.0896	0.0015	0	0
P1578	$Live_{ABOVE}$	2.129	-0.041	6.185	-0.0326	0.5008	-0.0005	0	0
P1579	$Live_{ABOVE}$	-0.39	0.053	6.368	-0.1088	-0.1732	-0.0125	0	0
P1580	$Live_{ABOVE}$	0.869	-0.125	-1.532	0.4389	0.1216	-0.0007	0	0
P1581	$Live_{ABOVE}$	-0.147	-0.434	-0.74	0.0351	0.0226	0.0002	0	0
P1582	$Live_{ABOVE}$	0.219	-0.002	-0.74	0.0191	0.0244	0.0001	0	0
P1583	$Live_{ABOVE}$	0.538	-0.014	-0.949	0.0113	0.0768	0.0002	0	0
P1584	$Live_{ABOVE}$	0.223	-0.013	-1.098	0.0168	-0.0046	4.146E-05	0	0
P1585	$Live_{ABOVE}$	0.083	0.251	-2.129	-0.0479	-2.6869	-0.0024	0	0
P1586	$Live_{ABOVE}$	0.749	-0.173	0.835	0.9299	0.204	-0.004	0	0
P1587	$Live_{ABOVE}$	-0.145	-0.222	1.721	1.2173	-0.0868	0.0004	0	0
P1588	$Live_{ABOVE}$	-0.796	-0.215	1.645	1.1978	0.0544	0.0003	0	0
P1589	$Live_{ABOVE}$	-1.487	-0.179	1.372	0.9969	-0.1227	-0.001	0	0
P1590	$Live_{ABOVE}$	-2.12	-0.134	0.213	0.6135	-0.3456	0.0065	0	0
P1591	$Live_{ABOVE}$	-0.146	0.357	-1.132	-0.0058	-0.6777	0.0033	0	0
P1592	$Live_{ABOVE}$	-0.108	0.537	-1.825	-0.0127	-0.4549	-0.005	0	0
P1593	$Live_{ABOVE}$	0.544	-0.919	-1.776	0.2796	2.6728	-0.0031	0	0
P1594	$Live_{ABOVE}$	0.416	-0.858	-1.403	0.235	2.308	0.0024	0	0
P1595	$Live_{ABOVE}$	0.307	-0.711	-1.205	0.1545	1.537	0.0082	0	0
P1596	$Live_{ABOVE}$	0.18	-0.07	-1.465	0.0185	0.938	-0.0026	0	0
P1597	$Live_{ABOVE}$	0.219	-0.321	-1.243	0.0897	1.147	0.0006	0	0
P1598	$Live_{ABOVE}$	-0.026	-1.511	-2.001	0.2977	3.7638	0.0014	0	0
P1599	$Live_{ABOVE}$	-0.129	-2.523	-0.468	0.1727	1.1063	0.0001	0	0
P1600	$Live_{ABOVE}$	-0.172	-1.654	0.203	0.0234	2.7871	-0.0019	0	0
P1601	$Live_{ABOVE}$	-0.174	-0.942	0.208	-0.0592	3.4134	-0.0033	0	0
P1602	$Live_{ABOVE}$	-0.138	-0.323	0.233	-0.2441	1.9211	-0.0033	0	0
P1603	$Live_{ABOVE}$	-0.095	0.35	-0.289	-0.633	0.0293	0.0014	0	0
P1604	$Live_{ABOVE}$	-9.998E-05	0.117	-0.822	0.0007	0.292	0.0016	0	0
P1605	$Live_{ABOVE}$	-0.562	0.159	-0.994	-0.4736	-0.0296	0.0008	0	0
P1606	$Live_{ABOVE}$	-0.085	0.265	-1.297	0.012	3.0553	-0.0016	0	0
P1607	$Live_{ABOVE}$	-1.861	0.058	-0.603	-0.3565	-0.4649	-0.002	0	0
P1608	$Live_{ABOVE}$	-1.377	0.112	0.742	-0.6189	-0.2931	0.0006	0	0
P1609	$Live_{ABOVE}$	-0.02	-0.089	-2.068	0.0761	-0.0122	0.0021	0	0
P1610	$Live_{ABOVE}$	-0.052	0.028	-3.631	0.0524	-0.1176	-0.0046	0	0
P1611	$Live_{ABOVE}$	0.025	1.36	0.063	0.3682	0.3295	0.0002	0	0
P1612	$Live_{ABOVE}$	0.474	-0.207	-0.527	0.8455	-0.0972	-0.0033	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
P1613	Live ABOVE	-1.913	-0.214	-1.453	0.7684	0.1675	-0.0007	0	0
P1614	Live ABOVE	-1.361	-0.221	1.169	0.7819	-0.1116	1.159E-05	0	0
P1615	Live ABOVE	-0.347	-0.227	2.253	0.8126	-0.0316	0.0007	0	0
P1616	Live ABOVE	0.536	-0.216	2.153	0.7985	-0.034	0.0003	0	0
P1617	Live ABOVE	0.991	0.01	-1.25	0.0764	-0.2673	-0.0007	0	0
P1618	Live ABOVE	0.59	-0.002	-1.57	0.1616	0.1415	-0.0006	0	0
P1619	Live ABOVE	0.446	-0.09	-2.396	0.368	-0.4425	-4.168E-05	0	0
P1620	Live ABOVE	-0.027	0.726	-0.154	-0.1504	-0.0229	-0.0028	0	0
P1621	Live ABOVE	-1.2	0.225	1.218	-1.0859	-0.3229	-0.0003	0	0
P1622	Live ABOVE	-0.587	0.212	1.348	-1.0381	0.0466	0.0004	0	0
P1623	Live ABOVE	0.023	0.208	0.955	-0.8902	0.0484	0.002	0	0
P1624	Live ABOVE	-0.207	0.001	0.534	-5.4101	0.0208	-2.101E-06	0	0
P1625	Live ABOVE	0.001	0.102	0.221	0.0315	2.6456	0.0002	0	0
P1626	Live ABOVE	5.658E-05	0.02	0.375	-0.0637	1.0245	-3.558E-05	0	0
P1627	Live ABOVE	-0.0002778	-0.3	0.404	-0.0414	-4.0487	-3.794E-05	0	0
P1628	Live ABOVE	-0.00023	-0.185	0.814	-0.9008	-0.3342	0.0002	0	0
P1629	Live ABOVE	-0.002	-0.617	1.542	0.1345	-2.175	0.0007	0	0
P1630	Live ABOVE	-0.009	-0.513	2.034	0.0681	-3.9231	-0.0012	0	0
P1631	Live ABOVE	-0.015	-0.302	1.991	-0.4771	-4.1599	-0.0071	0	0
P1632	Live ABOVE	-0.006	-0.059	1.884	-0.6427	-2.0464	-0.0027	0	0
P1633	Live ABOVE	-0.003	0.09	0.532	0.6167	-0.1111	-0.0015	0	0
P1634	Live ABOVE	-0.0002518	-0.007	0.05	-0.0042	-0.2916	-4.132E-05	0	0
P1635	Live ABOVE	0	-0.001	-0.027	-0.0234	-0.1106	4.489E-06	0	0
P1636	Live ABOVE	-0.003	0.066	0.074	0.024	-3.0999	-0.0005	0	0
P1637	Live ABOVE	-8.707E-05	0.007	0.235	0.1065	-0.9891	0.0001	0	0
143	SD ABOVE	0.094	0.098	-2.556	-0.3828	-0.4661	0.0001	0	0
144	SD ABOVE	0.378	0.321	-1.451	-1.4322	0.0654	0.0019	0	0
145	SD ABOVE	-0.104	1.347	-0.453	-0.2062	0.3773	-0.0025	0	0
146	SD ABOVE	-0.746	0.271	-3.744	-0.8266	0.0183	0.0444	8	16
147	SD ABOVE	0.097	-0.459	-0.347	-1.1974	0.7679	0.0011	0	0
148	SD ABOVE	-0.792	-0.144	-4.935	0.5294	-1.1615	-0.0004	0	0
149	SD ABOVE	0.007	0.081	-3.894	-0.082	0.4956	0.0005	0	0
150	SD ABOVE	0.186	-0.099	0.468	0.4111	0.0447	0.0009	0	0
151	SD ABOVE	0.172	-0.005	0.45	0.1625	-0.0142	-0.0476	0	0
155	SD ABOVE	0.108	-1.089	0.745	3.4288	0.2621	0.0112	8	24
156	SD ABOVE	0.024	1.539	2.823	-1.9857	0.4434	-0.1252	8	16
162	SD ABOVE	1.039	-0.138	0.639	0.5217	0.1101	-0.0002	0	0
163	SD ABOVE	1.169	-0.107	-0.11	0.4928	0.3178	0.0491	12	8
164	SD ABOVE	0.763	-0.047	-3.013	-0.7842	-0.1239	0.0054	0	0
165	SD ABOVE	-0.002	-0.333	-3.605	-0.1162	-0.0439	-0.0004	0	0
167	SD ABOVE	0.034	-0.001	-2.726	0.0112	0.1832	2.615E-05	0	0
168	SD ABOVE	0.315	0.177	-1.141	-1.2428	0.2148	0.0027	8	16
170	SD ABOVE	1.311	-0.136	-5.51	1.0836	1.0175	0.0789	8	12
172	SD ABOVE	-1.008	-0.961	0.568	1.6435	-1.4781	0.0139	24	8

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
173	SD_{ABOVE}	0.705	-0.193	0.823	0.9892	0.1359	-0.0004	0	0
174	SD_{ABOVE}	-0.047	-0.666	-2.979	-0.0147	-0.1624	0.0004	0	0
175	SD_{ABOVE}	-0.059	-0.404	-1.625	0.9238	-0.3101	0.0308	8	16
177	SD_{ABOVE}	0.027	-0.048	-2.312	0.2973	0.1623	0.0006	8	24
179	SD_{ABOVE}	0.053	0.367	-3.464	0.6579	0.0807	0.0203	16	8
183	SD_{ABOVE}	0.281	-0.034	-1.617	0.2228	-0.2819	0.0169	8	12
184	SD_{ABOVE}	-0.121	0.554	-2.536	-1.1249	-0.5383	0.0484	8	24
185	SD_{ABOVE}	0.118	-0.017	-0.997	0.0332	0.008	0.0041	8	16
186	SD_{ABOVE}	0.049	0.172	-2.816	0.0143	0.0401	-0.0194	8	60
191	SD_{ABOVE}	0.091	0.863	3.209	-0.3001	0.8262	-0.1069	8	16
192	SD_{ABOVE}	0.043	0.934	-3.803	-0.7091	0.3614	0.0002	0	0
193	SD_{ABOVE}	0.038	-0.021	-0.481	0.0414	0.1691	-0.0075	0	0
194	SD_{ABOVE}	-0.039	0.315	-2.469	0.1355	-0.1202	0.0009	0	0
196	SD_{ABOVE}	0.006	0.018	-0.494	0.1579	0.0312	0.0019	8	16
197	SD_{ABOVE}	-0.005	0.2	-1.541	-0.0116	0.0463	-0.001	8	16
198	SD_{ABOVE}	0.662	0.555	2.067	-0.6729	3.7467	-0.06	24	8
200	SD_{ABOVE}	-0.0002919	0.037	-1.738	-0.1916	-0.0019	2.615E-05	0	0
203	SD_{ABOVE}	-0.002	0.007	-0.308	-0.0297	-0.0063	2.615E-05	0	0
204	SD_{ABOVE}	0.305	0.124	-1.671	-0.5282	0.5294	-0.0116	16	8
205	SD_{ABOVE}	0.127	0.042	-1.944	-0.2079	-0.0919	0.001	0	0
206	SD_{ABOVE}	-0.984	0.15	-0.436	-0.7734	-0.2695	-0.0004	0	0
207	SD_{ABOVE}	-1.495	1.061	-7.296	-0.0004	-0.1923	-0.0061	0	0
214	SD_{ABOVE}	-0.068	0.024	-0.497	-0.213	-0.0244	0.0145	0	0
215	SD_{ABOVE}	0.777	-0.018	-0.763	0.0242	0.0886	-0.0051	0	0
216	SD_{ABOVE}	0.093	0.08	-0.618	-0.3824	0.0747	-0.0639	0	0
217	SD_{ABOVE}	0.044	0.051	-0.223	-0.2307	0.192	0.0402	0	0
219	SD_{ABOVE}	1.11	-0.071	-3.094	0.678	1.9987	0.022	8	12
222	SD_{ABOVE}	-1.355	-0.092	-3.498	0.3514	-0.1524	0.0062	0	0
223	SD_{ABOVE}	0.197	-0.534	-1.088	0.196	1.3497	-0.0029	0	0
224	SD_{ABOVE}	-0.032	0.172	-0.49	0.0155	-0.2813	-0.0375	0	0
225	SD_{ABOVE}	-0.022	-0.51	-2.577	2.9482	-0.2075	0.0003	16	8
226	SD_{ABOVE}	0.236	-0.612	-1.474	1.2565	1.6147	0.0122	16	8
228	SD_{ABOVE}	-0.008	-0.405	-1.951	2.2726	-0.0314	0.0003	16	8
308	SD_{ABOVE}	-0.077	-0.144	-1.657	0.7184	-0.5566	0.0003	16	8
309	SD_{ABOVE}	0.027	-0.772	-1.682	0.5848	0.7272	0.044	16	8
310	SD_{ABOVE}	-0.07	-1.744	-3.903	0.2604	-0.0093	-0.0013	0	0
527	SD_{ABOVE}	0.006	-0.822	-4.963	0.0055	-0.1079	0.023	16	8
528	SD_{ABOVE}	-0.135	-1.111	-4.027	0.3145	-0.2222	0.0348	16	8
531	SD_{ABOVE}	0.008	0.094	-3.506	0.0806	0.2644	0.1036	8	24
532	SD_{ABOVE}	-0.116	0.182	-1.266	-1.1582	0.0556	-0.0008	0	0
533	SD_{ABOVE}	-0.081	0.19	-1.188	-1.2205	-0.092	0.0014	0	0
537	SD_{ABOVE}	0.05	0.615	-3.092	1.0919	-0.0418	-0.0001	0	0
538	SD_{ABOVE}	-0.118	0.097	-2.015	-0.2059	-0.057	0.0253	8	16
539	SD_{ABOVE}	0.29	0.417	-2.286	-2.0444	0.1393	-0.1262	16	8

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
540	SD_{ABOVE}	-0.109	0.367	-1.407	-1.3804	-0.0702	0.0843	16	8
553	SD_{ABOVE}	0.209	1.037	3.156	-1.9144	0.9237	-0.0812	8	16
561	SD_{ABOVE}	0.001	-0.066	-1.785	0.3723	0.0069	2.615E-05	0	0
575	SD_{ABOVE}	-0.022	-0.02	-2.832	0.0955	-0.1544	0	12	12
576	SD_{ABOVE}	0.022	-0.021	-4.563	0.1052	0.1525	0	12	12
580	SD_{ABOVE}	-0.324	0.043	0.332	-1.1976	-0.0878	-0.0651	0	0
581	SD_{ABOVE}	0.156	0.314	-1.662	-0.041	0.0304	0.0005	0	0
582	SD_{ABOVE}	-2.3E-05	0.022	0.096	-0.0176	0.1058	-8.628E-06	0	0
588	SD_{ABOVE}	0.012	-0.392	-0.213	0.1845	-0.3803	0.0257	0	0
589	SD_{ABOVE}	0.033	-0.639	0.488	1.552	-1.2367	0.0108	0	0
592	SD_{ABOVE}	0	-0.022	0.142	-0.0822	-0.3178	1.28E-06	0	0
597	SD_{ABOVE}	0.035	0.181	-0.889	0.0131	0.3233	0.0476	0	0
599	SD_{ABOVE}	-0.292	0.057	-1.002	-0.1161	-0.261	0.0032	0	0
600	SD_{ABOVE}	-0.723	0.57	0.793	-1.4885	-1.2527	0.0073	0	0
604	SD_{ABOVE}	0.014	0.002	-0.175	0.0017	0.0009	-0.0001	0	0
661	SD_{ABOVE}	-0.027	0.092	-8.872	-0.4736	-0.1133	0.0001	0	0
664	SD_{ABOVE}	0.26	0.173	0.503	-0.7693	-0.0388	0.046	16	8
663	SD_{ABOVE}	-0.019	0.033	-0.153	1.2028	0.0897	0.0172	0	0
666	SD_{ABOVE}	-0.022	0.041	-0.253	1.4054	-0.1087	-0.0199	0	0
P1563	SD_{ABOVE}	-0.637	0.032	-1.497	1.5556	-0.0924	0.0006	0	0
P1564	SD_{ABOVE}	-0.351	0.048	-1.23	1.0307	-0.0751	-0.0078	0	0
P1565	SD_{ABOVE}	0.339	0.244	-0.469	-1.1947	0.0474	0.0069	0	0
P1566	SD_{ABOVE}	0.254	0.31	-0.431	-1.6433	0.0615	-0.0005	0	0
P1567	SD_{ABOVE}	0.034	0.359	-0.498	-1.7237	-0.0037	-0.0024	0	0
P1568	SD_{ABOVE}	-0.13	0.294	-0.803	-1.3064	-0.0403	-0.0039	0	0
P1569	SD_{ABOVE}	0.059	2.213	-0.147	-0.3647	0.0854	-0.0034	0	0
P1570	SD_{ABOVE}	0.028	1.864	0.186	-0.1996	0.1851	-0.0013	0	0
P1571	SD_{ABOVE}	0.347	0.004	0.056	-0.1074	0.058	0.0013	0	0
P1572	SD_{ABOVE}	0.521	0.029	-0.354	-0.1376	0.157	0.0017	0	0
P1573	SD_{ABOVE}	-0.185	0.2	-0.227	-0.8457	-0.0001	-0.002	0	0
P1574	SD_{ABOVE}	0.227	0.291	0.194	-1.3003	-0.0203	-0.0017	0	0
P1575	SD_{ABOVE}	-0.05	0.119	-0.077	-2.4055	-0.0169	-0.0004	0	0
P1576	SD_{ABOVE}	1.321	-0.108	-0.047	0.5828	0.183	-0.0014	0	0
P1577	SD_{ABOVE}	0.887	-0.135	0.646	0.723	-0.0265	-6.479E-06	0	0
P1578	SD_{ABOVE}	0.288	-0.231	1.908	1.1886	0.0948	-0.0032	0	0
P1579	SD_{ABOVE}	-0.61	-0.227	2.301	0.9805	-0.1172	0.0065	0	0
P1580	SD_{ABOVE}	0.746	-0.106	-1.261	0.3717	0.107	-0.0007	0	0
P1581	SD_{ABOVE}	-0.123	-0.382	-0.651	0.0225	0.0205	0.0002	0	0
P1582	SD_{ABOVE}	0.233	-0.002	-0.693	0.0135	0.0266	0.0001	0	0
P1583	SD_{ABOVE}	0.553	-0.01	-0.755	0.0018	0.0805	0.0002	0	0
P1584	SD_{ABOVE}	0.27	-0.008	-0.8	0.0028	0.0076	-6.747E-06	0	0
P1585	SD_{ABOVE}	0.072	0.197	-1.852	-0.0519	-2.4034	-0.0022	0	0
P1586	SD_{ABOVE}	0.706	-0.148	0.721	0.8026	0.1824	-0.0035	0	0
P1587	SD_{ABOVE}	-0.07	-0.189	1.508	1.0479	-0.0683	0.0003	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
P1588	SD_{ABOVE}	-0.63	-0.182	1.447	1.0271	0.0568	0.0003	0	0
P1589	SD_{ABOVE}	-1.224	-0.152	1.211	0.8528	-0.0972	-0.0008	0	0
P1590	SD_{ABOVE}	-1.763	-0.115	0.224	0.5226	-0.2868	0.0057	0	0
P1591	SD_{ABOVE}	-0.126	0.314	-0.977	-0.0139	-0.5835	0.0028	0	0
P1592	SD_{ABOVE}	-0.093	0.468	-1.512	-0.0228	-0.3903	-0.0044	0	0
P1593	SD_{ABOVE}	0.468	-0.709	-1.483	0.2203	2.3169	-0.0028	0	0
P1594	SD_{ABOVE}	0.356	-0.655	-1.153	0.1796	1.9993	0.0021	0	0
P1595	SD_{ABOVE}	0.264	-0.539	-0.961	0.1135	1.3308	0.0073	0	0
P1596	SD_{ABOVE}	0.154	-0.023	-1.274	0.0021	0.8111	-0.0022	0	0
P1597	SD_{ABOVE}	0.188	-0.226	-1.046	0.0604	0.9915	0.0005	0	0
P1598	SD_{ABOVE}	-0.021	-1.247	-1.681	0.2365	3.37	0.0012	0	0
P1599	SD_{ABOVE}	-0.11	-2.019	-0.383	0.1119	1.1653	0.0001	0	0
P1600	SD_{ABOVE}	-0.146	-1.296	0.175	-0.0118	2.7959	-0.0016	0	0
P1601	SD_{ABOVE}	-0.147	-0.695	0.182	-0.0812	3.4088	-0.0028	0	0
P1602	SD_{ABOVE}	-0.118	-0.16	0.206	-0.2375	2.0649	-0.0028	0	0
P1603	SD_{ABOVE}	-0.084	0.425	-0.248	-0.5748	0.265	0.0015	0	0
P1604	SD_{ABOVE}	0.002	0.091	-0.659	-0.0079	0.2506	0.0014	0	0
P1605	SD_{ABOVE}	-0.429	0.14	-0.789	-0.4179	-0.0169	0.0006	0	0
P1606	SD_{ABOVE}	-0.073	0.237	-1.132	-0.002	2.6673	-0.0014	0	0
P1607	SD_{ABOVE}	-1.497	0.055	-0.524	-0.3207	-0.3808	-0.0019	0	0
P1608	SD_{ABOVE}	-1.075	0.098	0.643	-0.5436	-0.2303	0.0005	0	0
P1609	SD_{ABOVE}	-0.013	-0.023	-1.742	0.0481	0.0028	0.0017	0	0
P1610	SD_{ABOVE}	0.005	0.101	-2.752	0.0147	0.1387	-0.0029	0	0
P1611	SD_{ABOVE}	0.051	1.151	0.162	0.2522	0.4125	0.0003	0	0
P1612	SD_{ABOVE}	0.183	-0.087	-0.413	0.3423	-0.0818	-0.0013	0	0
P1613	SD_{ABOVE}	-1.483	-0.18	-0.972	0.6593	0.1431	-0.0006	0	0
P1614	SD_{ABOVE}	-0.983	-0.189	1.087	0.6851	-0.0512	5.744E-06	0	0
P1615	SD_{ABOVE}	-0.101	-0.195	1.963	0.717	0.0318	0.0005	0	0
P1616	SD_{ABOVE}	0.692	-0.186	1.894	0.703	0.0485	0.0002	0	0
P1617	SD_{ABOVE}	1.007	0.007	-0.976	0.0712	-0.1702	-0.0003	0	0
P1618	SD_{ABOVE}	0.4	-0.005	-0.817	0.1188	0.0504	-0.0003	0	0
P1619	SD_{ABOVE}	0.292	-0.074	-1.688	0.2996	-0.3458	-0.0001	0	0
P1620	SD_{ABOVE}	-0.022	0.65	-0.121	-0.1263	-0.0113	-0.0024	0	0
P1621	SD_{ABOVE}	-0.937	0.193	1.056	-0.9421	-0.2616	-0.0002	0	0
P1622	SD_{ABOVE}	-0.418	0.181	1.173	-0.8985	0.0582	0.0004	0	0
P1623	SD_{ABOVE}	0.099	0.178	0.837	-0.7684	0.0568	0.0018	0	0
P1624	SD_{ABOVE}	-0.121	0.0004157	0.245	-2.4784	0.0119	-0.0001	0	0
P1625	SD_{ABOVE}	0.001	0.105	0.19	0.0276	2.362	0.0002	0	0
P1626	SD_{ABOVE}	4.254E-05	0.02	0.326	-0.0562	0.9077	-2.681E-05	0	0
P1627	SD_{ABOVE}	-0.0002144	-0.241	0.349	-0.0342	-3.6186	-2.777E-05	0	0
P1628	SD_{ABOVE}	-0.0001961	-0.148	0.7	-0.7419	-0.3519	0.0002	0	0
P1629	SD_{ABOVE}	-0.002	-0.491	1.33	0.1272	-2.1463	0.0006	0	0
P1630	SD_{ABOVE}	-0.007	-0.398	1.749	0.0709	-3.8128	-0.001	0	0
P1631	SD_{ABOVE}	-0.013	-0.217	1.71	-0.3964	-4.0553	-0.006	0	0

Table 4.2 - Joint Loads Assignments - Force (continued)

UniqueName	Load Pattern	FX kip	FY kip	FZ kip	MX kip-ft	MY kip-ft	MZ kip-ft	X Dimension in	Y Dimension in
P1632	SD_{ABOVE}	-0.005	-0.014	1.615	-0.5461	-2.1498	-0.0023	0	0
P1633	SD_{ABOVE}	-0.003	0.109	0.444	0.5381	-0.2967	-0.0013	0	0
P1634	SD_{ABOVE}	-0.0001928	0.006	0.045	-0.0045	-0.245	-3.146E-05	0	0
P1635	SD_{ABOVE}	0	0.001	-0.022	-0.0203	-0.0926	3.395E-06	0	0
P1636	SD_{ABOVE}	-0.002	0.084	0.063	0.0207	-2.6992	-0.0004	0	0
P1637	SD_{ABOVE}	-6.453E-05	0.009	0.205	0.0928	-0.862	4.154E-05	0	0

4.2.2 Area Loads

Table 4.3 - Area Load Assignments - Uniform

UniqueName	Load Pattern	Direction	Load lb/ft2
F1	Live	Gravity	60
F12	Live	Gravity	40
F9	Live	Gravity	30
F4	Live	Gravity	30
F5	Live	Gravity	30
F6	Live	Gravity	30
F7	Live	Gravity	30
F10	Live	Gravity	30
F11	Live	Gravity	30
F8	Live	Gravity	250
F1	SD	Gravity	25
F12	SD	Gravity	35
F9	SD	Gravity	25
F4	SD	Gravity	25
F5	SD	Gravity	25
F6	SD	Gravity	25
F7	SD	Gravity	25
F10	SD	Gravity	25
F11	SD	Gravity	25
F8	SD	Gravity	25

4.3 Load Cases

Table 4.4 - Load Case Definitions - Summary

Name	Type
Dead	Linear Static
Live	Linear Static
SD	Linear Static
LCase1	Nonlinear Static
LCase2	Nonlinear Static
LCase3	Nonlinear Static
LCase4	Nonlinear Static
LCase5	Nonlinear Static

4.4 Load Combinations

Table 4.5 - Load Combination Definitions

Name	Type	Is Auto	Load Name	SF	Notes
Comb1	Linear Add	No	Dead	1	
Comb1			SD	1	
Comb1			Live	1	
LT LL	Linear Add	No	LCase3	1	
LT LL			LCase1	1	
LT LL			LCase2	-1	
LT LL			LCase5	-1	
LT SD+LL	Linear Add	No	LCase3	1	
LT SD+LL			LCase1	1	
LT SD+LL			LCase2	-1	
LT SD+LL			LCase4	-1	
LT TOTAL	Linear Add	No	LCase3	1	
LT TOTAL			LCase1	1	
LT TOTAL			LCase2	-1	
UDConS1	Linear Add	No	Dead	1.4	Dead [Strength]
UDConS1			SD	1.4	
UDConS2	Linear Add	No	Dead	1.2	Dead + Live [Strength]
UDConS2			Live	1.6	
UDConS2			SD	1.2	

PALACIOS
ENGINEERING LLC

Concrete Beams Dividing Sheet

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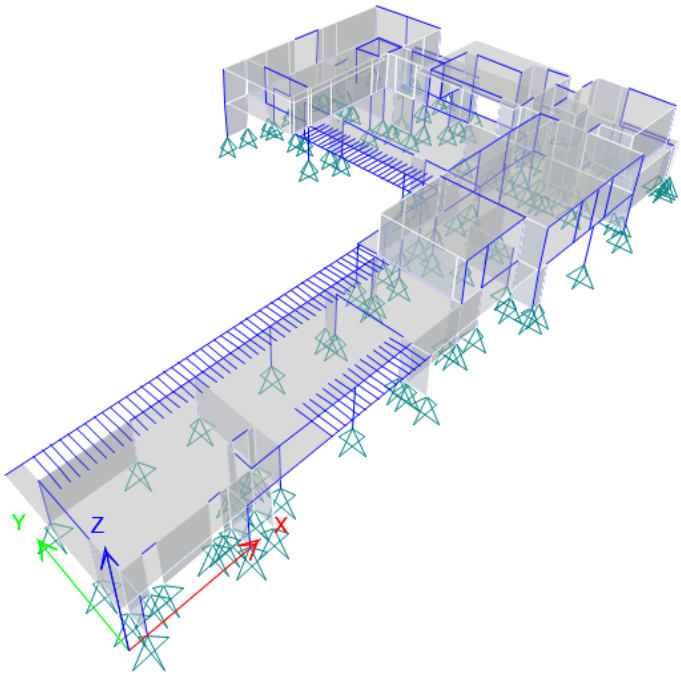

CONCRETE BEAMS

Model File: 10840 SW 67 ave model, Revision 0
4/3/2025

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1.1 Concrete Frame Design 3

1 Design Data

This chapter provides design data and results.

1.1 Concrete Frame Design

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B1	1	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.5567	0	UDConS2
Top (+2 Axis) Middle	35.9708	-3.3981	0	UDConS2
Top (+2 Axis) End-J	71.9416	-6.7762	0	UDConS2
Bot (-2 Axis) End-I	0	1.7783	0	UDConS2
Bot (-2 Axis) Middle	35.9708	1.6941	0	UDConS2
Bot (-2 Axis) End-J	71.9416	3.3881	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.336	0	1.038	35.9708	1.397	71.9416
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.3883	71.9416	0.3883	71.9416
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B2	2	2B-27	111.3691	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-6.4129	0	UDConS2
Top (+2 Axis) Middle	74.2461	-1.6032	0	UDConS2
Top (+2 Axis) End-J	103.3691	-3.4973	0	UDConS3
Bot (-2 Axis) End-I	4	3.2065	0	UDConS2
Bot (-2 Axis) Middle	74.2461	5.4421	0	UDConS2
Bot (-2 Axis) End-J	103.3691	1.7487	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.4	4	3.572	37.123	3.936	103.3691
UDConS2		UDConS2		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.7257	74.2461	3.7257	74.2461
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B3	3	2B-33	96.4547	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	16.0758	-0.6298	0	UDConS2
Top (+2 Axis) Middle	64.3031	-0.6298	0	UDConS2
Top (+2 Axis) End-J	92.4547	-2.5192	0	UDConS2
Bot (-2 Axis) End-I	0	0.709	0	UDConS3
Bot (-2 Axis) Middle	64.3031	1.4355	0	UDConS2
Bot (-2 Axis) End-J	92.4547	1.2596	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.196	0	1.498	64.3031	1.873	92.4547
UDConS4		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.7739	32.1516	0.7739	32.1516
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B4	4	2B-33	10.1703	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28			0	0
Bot (-2 Axis)	0.36	0.28			0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-0.1794	0	UDConS6
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	10.1703	0	0	UDConS6
Bot (-2 Axis) End-I	4	0.0897	0	UDConS6
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	10.1703	1.4551	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.917	4			2.835	10.1703
UDConS2				UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.4472	10.1703	0.4472	10.1703
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B5	5	2B-32	96.4547	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31
Bot (-2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	16.0758	-9.3926	0	UDConS2
Top (+2 Axis) Middle	64.3031	-9.3926	0	UDConS2
Top (+2 Axis) End-J	92.4547	-37.5702	0	UDConS2
Bot (-2 Axis) End-I	16.0758	9.3926	0	UDConS2
Bot (-2 Axis) Middle	32.1516	12.395	0	UDConS2
Bot (-2 Axis) End-J	92.4547	18.7851	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.397	0	16.467	64.3031	17.312	92.4547
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1661	1.0244

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.8719	92.4547	1.8719	92.4547
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B6	6	2B-32	10.1703	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8933	0.31			0.8933	0.31
Bot (-2 Axis)	0.8933	0.31			0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	9.9703	-1.64	0	UDConS4
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	10.1703	-1.4359	0	UDConS4
Bot (-2 Axis) End-I	9.9703	0.82	0	UDConS4
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	10.1703	0.7179	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.08		0.08

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
12.431	9.9703			12.425	10.1703
UDConS2				UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B7	7	2B-32	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.8933	0.31	0.8933	0.31
Bot (-2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	33.4414	-2.3273	0	UDConS2
Top (+2 Axis) End-J	54.8829	-9.3091	0	UDConS2
Bot (-2 Axis) End-I	0	3.3807	0	UDConS2
Bot (-2 Axis) Middle	16.7207	2.5315	0	UDConS2
Bot (-2 Axis) End-J	54.8829	4.6545	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.359	0	5.868	33.4414	6.511	54.8829
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1796	1.1078

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
13.9579	54.8829	13.9579	54.8829
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B8	8	2B-32	17.4921	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0			0	0
Bot (-2 Axis)	0.8933	0.31			0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	17.4921	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.4619	0	UDConS2
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	17.4921	2.0172	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.86	0			0.248	17.4921
UDConS1				UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1661	1.0244

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
4.6366	17.4921	4.6366	17.4921
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B9	9	2B-10	15.764	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0			0	0
Bot (-2 Axis)	0.7333	0.31			0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	0	0	UDConS6
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	15.764	0	0	UDConS6
Bot (-2 Axis) End-I	12	1.023	0	UDConS3
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	15.764	2.1819	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.153	12			4.043	15.764
UDConS1				UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.2921	15.764	0.2921	15.764
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B10	10	2B-10	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	33.4414	-0.6437	0	UDConS3
Top (+2 Axis) End-J	54.8829	-2.5748	0	UDConS3
Bot (-2 Axis) End-I	0	1.845	0	UDConS3
Bot (-2 Axis) Middle	33.4414	2.8095	0	UDConS4
Bot (-2 Axis) End-J	54.8829	1.2874	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.839	0	2.376	33.4414	2.912	54.8829
UDConS4		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.4627	54.8829	1.4627	54.8829
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B11	11	2B-39	554.1875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.4728	0.59
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2244	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	126.3779	-3.6196	0	UDConS2
Top (+2 Axis) Middle	407.3602	-3.6196	0	UDConS2
Top (+2 Axis) End-J	554.1875	-14.4786	0	UDConS2
Bot (-2 Axis) End-I	126.3779	3.6196	0	UDConS2
Bot (-2 Axis) Middle	407.3602	4.0364	0	UDConS2
Bot (-2 Axis) End-J	554.1875	7.2393	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.08

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.044	0	0.994	167.5572	4.076	554.1875
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B12	12	2B-34	19.2895	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
24	10.5	24	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.64	0.25			0.64	0.25
Bot (-2 Axis)	0.64	0.25			0.64	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-8.246	0	UDConS1
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	19.2895	-0.9657	0	UDConS2
Bot (-2 Axis) End-I	0	4.123	0	UDConS1
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	19.2895	0.4829	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.204	0			4.613	19.2895
UDConS1				UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1653	0.7577

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.978	19.2895	3.978	19.2895
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B13	13	2B-34	202.7789	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
24	10.5	24	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7855	0.31	0.64	0.25	0.7976	0.32
Bot (-2 Axis)	0.64	0.25	0.64	0.25	0.64	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-26.9174	0	UDConS2
Top (+2 Axis) Middle	132.2188	-6.8276	0	UDConS2
Top (+2 Axis) End-J	202.7789	-27.3106	0	UDConS2
Bot (-2 Axis) End-I	0	13.4587	0	UDConS2
Bot (-2 Axis) Middle	108.6987	18.0659	0	UDConS2
Bot (-2 Axis) End-J	155.7388	14.5688	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
9.194	0	3.634	54.3494	9.687	202.7789
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1653	0.7577

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
8.4646	72.4658	8.4646	72.4658
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B14	14	2B-34	96.4941	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
24	10.5	24	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.64	0.25	0.64	0.25	0.64	0.25
Bot (-2 Axis)	0.64	0.25	0.64	0.25	0.64	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.8304	-0.194	UDConS2
Top (+2 Axis) Middle	65.029	-0.7076	0	UDConS2
Top (+2 Axis) End-J	96.4941	-1.3022	0	UDConS2
Bot (-2 Axis) End-I	0	1.4152	-0.194	UDConS2
Bot (-2 Axis) Middle	65.029	1.5029	0	UDConS2
Bot (-2 Axis) End-J	80.7615	0.7076	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.399	0	0.657	65.029	1.483	96.4941
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1951	0.8941

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0	65.029	0	65.029
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B15	15	2B-29	114.3924	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-9.3287	0	UDConS4
Top (+2 Axis) Middle	76.2616	-2.9231	0	UDConS3
Top (+2 Axis) End-J	106.3924	-11.6925	0	UDConS3
Bot (-2 Axis) End-I	8	4.6644	0	UDConS4
Bot (-2 Axis) Middle	38.1308	14.1784	0	UDConS2
Bot (-2 Axis) End-J	106.3924	5.8462	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
9.01	8	8.257	38.1308	8.355	106.3924
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
4.081	106.3924	4.081	106.3924
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B16	16	2B-30	127.9882	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	27.3314	-3.4001	0	UDConS3
Top (+2 Axis) Middle	85.3255	-3.4001	0	UDConS3
Top (+2 Axis) End-J	119.9882	-13.6004	0	UDConS3
Bot (-2 Axis) End-I	27.3314	6.1199	0	UDConS3
Bot (-2 Axis) Middle	85.3255	14.6683	0	UDConS2
Bot (-2 Axis) End-J	119.9882	6.8002	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.474	12	8.472	85.3255	9.339	119.9882
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.3946	85.3255	2.3946	85.3255
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B17	17	TB-1	39.0381	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.1094	0	UDConS6
Top (+2 Axis) Middle	19.5191	-0.5601	0	UDConS3
Top (+2 Axis) End-J	39.0381	-1.8629	0	UDConS3
Bot (-2 Axis) End-I	0	2.2403	0	UDConS3
Bot (-2 Axis) Middle	19.5191	0.5601	0	UDConS3
Bot (-2 Axis) End-J	39.0381	0.9314	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.066	0	1.261	19.5191	1.456	39.0381
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.1426	39.0381	0.1426	39.0381
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B18	18	2B-31	209.0711	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-51.9801	0	UDConS2
Top (+2 Axis) Middle	146.3498	-12.995	0	UDConS2
Top (+2 Axis) End-J	187.164	-12.995	0	UDConS2
Bot (-2 Axis) End-I	4	25.99	0	UDConS2
Bot (-2 Axis) Middle	83.6284	34.4054	0	UDConS2
Bot (-2 Axis) End-J	167.2569	31.1501	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
23.466	4	4.795	62.7213	6.562	207.0711
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.8345	41.8142	2.8345	41.8142
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B19	19	2B-31	31.592	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	1.7467	0.32	0	0
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	0	0	UDConS6
Top (+2 Axis) Middle	16.796	-6.2339	0	UDConS3
Top (+2 Axis) End-J	31.592	0	0	UDConS6
Bot (-2 Axis) End-I	2	16.9292	0	UDConS2
Bot (-2 Axis) Middle	16.796	21.3811	0	UDConS3
Bot (-2 Axis) End-J	31.592	24.9356	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.141	2	3.302	16.796	2.464	31.592
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.5848	31.592	0.5848	31.592
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B20	20	2B-31	50.8953	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	38.1715	-7.5873	0	UDConS3
Top (+2 Axis) End-J	50.8953	-5.884	0	UDConS2
Bot (-2 Axis) End-I	0	30.349	0	UDConS3
Bot (-2 Axis) Middle	12.7238	26.3993	0	UDConS3
Bot (-2 Axis) End-J	50.8953	2.942	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
3.795	0	12.699	38.1715	13.42	50.8953
UDConS2		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.2378	50.8953	2.2378	50.8953
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B21	21	TB-1	41.2272	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0	0
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-0.5325	0	UDConS4
Top (+2 Axis) Middle	24.6136	-0.3359	0	UDConS3
Top (+2 Axis) End-J	41.2272	0	0	UDConS6
Bot (-2 Axis) End-I	8	0.2663	0	UDConS4
Bot (-2 Axis) Middle	24.6136	0.6261	0	UDConS3
Bot (-2 Axis) End-J	41.2272	1.3436	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.819	8	0.653	24.6136	0.487	41.2272
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.0473	41.2272	0.0473	41.2272
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B22	22	TB-1	8.3886	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0			0	0
Bot (-2 Axis)	0.2533	0.26			0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	0.3886	0	0	UDConS6
Bot (-2 Axis) End-I	0	9.2537	0	UDConS3
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	0.3886	8.4557	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.5165		0.5166

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
24.643	0			24.647	0.3886
UDConS3				UDConS3	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B23	23	2B-16	158.4854	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-5.4744	0	UDConS2
Top (+2 Axis) Middle	98.4854	-1.3801	0	UDConS2
Top (+2 Axis) End-J	150.4854	-5.5203	0	UDConS2
Bot (-2 Axis) End-I	0	2.7372	0	UDConS2
Bot (-2 Axis) Middle	68.3169	5.8823	0	UDConS2
Bot (-2 Axis) End-J	150.4854	2.7601	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.965	0	2.584	38.1485	2.508	150.4854
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.0163	150.4854	2.0163	150.4854
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B24	24	2B-16	10.1396	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8385	0.87			0.2863	0.3
Bot (-2 Axis)	0.3881	0.4			0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-31.192	0	UDConS2
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	9.25	-11.6977	0	UDConS2
Bot (-2 Axis) End-I	0	15.596	0	UDConS2
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	9.25	7.798	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.3348		0.3324

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
18.171	0.6909			18.086	9.25
UDConS2				UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B25	25	2B-17	149.9375	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	20	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.4667	0.29	0.4667	0.29	0.4667	0.29
Bot (-2 Axis)	0.4667	0.29	0.4667	0.29	0.4667	0.29

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	18.7422	-7.8745	0	UDConS2
Top (+2 Axis) Middle	112.4531	-7.8745	0	UDConS2
Top (+2 Axis) End-J	149.9375	-31.4981	0	UDConS2
Bot (-2 Axis) End-I	0	21.644	0	UDConS2
Bot (-2 Axis) Middle	37.4844	18.8232	0	UDConS2
Bot (-2 Axis) End-J	149.9375	15.749	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.0061

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.967	18.7422	11.279	112.4531	11.904	149.9375
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1587	0.5554

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.6421	149.9375	3.6421	149.9375
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B26	26	2B-17	31.0625	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	20	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.4707	0.29			0	0
Bot (-2 Axis)	0.4667	0.29			0.4667	0.29

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-35.602	0	UDConS2
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	31.0625	0	0	UDConS6
Bot (-2 Axis) End-I	12	17.801	0	UDConS2
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	31.0625	35.0744	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.5051		0.5003

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
44.65	12			44.333	31.0625
UDConS2				UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B27	27	2B-20	131.25	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.6508	0	UDConS1
Top (+2 Axis) Middle	87.5	-0.2414	0	UDConS2
Top (+2 Axis) End-J	131.25	-0.9655	0	UDConS2
Bot (-2 Axis) End-I	21.875	0.5115	0	UDConS2
Bot (-2 Axis) Middle	43.75	1.0491	0	UDConS2
Bot (-2 Axis) End-J	131.25	0.4827	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.743	0	0.369	87.5	0.771	131.25
UDConS2		UDConS1		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.4782	43.75	2.4782	43.75
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B28	28	2B-20	98.6249	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.5524	0	UDConS2
Top (+2 Axis) Middle	65.7499	-0.1381	0	UDConS2
Top (+2 Axis) End-J	82.1874	-0.1381	0	UDConS2
Bot (-2 Axis) End-I	0	0.2762	0	UDConS2
Bot (-2 Axis) Middle	65.7499	1.563	0	UDConS2
Bot (-2 Axis) End-J	82.1874	1.0998	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.45	0	0.351	32.875	0.667	98.6249
UDConS2		UDConS1		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.6754	32.875	0.6754	32.875
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B29	29	2B-22	26.9826	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-4.869	0	UDConS2
Top (+2 Axis) Middle	14.4913	-2.2787	0	UDConS2
Top (+2 Axis) End-J	26.9826	-0.2948	0	UDConS1
Bot (-2 Axis) End-I	2	2.4345	0	UDConS2
Bot (-2 Axis) Middle	14.4913	1.2172	0	UDConS2
Bot (-2 Axis) End-J	26.9826	0.1474	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.572	2	2.405	14.4913	2.239	26.9826
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.8459	26.9826	1.8459	26.9826
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B30	30	2B-22	26.0362	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	12.0181	-1.1823	0	UDConS2
Top (+2 Axis) End-J	24.0362	-4.729	0	UDConS2
Bot (-2 Axis) End-I	0	2.982	0	UDConS1
Bot (-2 Axis) Middle	12.0181	1.1823	0	UDConS2
Bot (-2 Axis) End-J	24.0362	2.3645	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
3.537	0	3.697	12.0181	3.858	24.0362
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.8888	24.0362	0.8888	24.0362
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B31	31	2B-22	77.4543	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0	0
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-15.4796	0	UDConS2
Top (+2 Axis) Middle	58.0908	-3.8699	0	UDConS2
Top (+2 Axis) End-J	77.4543	0	0	UDConS6
Bot (-2 Axis) End-I	2	7.7398	0	UDConS2
Bot (-2 Axis) Middle	58.0908	8.0535	0	UDConS2
Bot (-2 Axis) End-J	77.4543	10.3486	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
7.295	2	6.805	38.7272	2.649	77.4543
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.0746	77.4543	2.0746	77.4543
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B32	32	2B-40	64.3394	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	24	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.5733	0.3	0.5733	0.3
Bot (-2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	32.1697	-4.656	0	UDConS2
Top (+2 Axis) End-J	62.3394	-18.6238	0	UDConS2
Bot (-2 Axis) End-I	0	15.3191	0	UDConS1
Bot (-2 Axis) Middle	16.0848	7.2486	0	UDConS1
Bot (-2 Axis) End-J	62.3394	9.3119	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.833	0	6.975	32.1697	7.578	62.3394
UDConS1		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1609	0.6706

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
6.2609	32.1697	6.2609	32.1697
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B33	33	2B-37	292.375	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	59.1459	-1.5457	0	UDConS2
Top (+2 Axis) Middle	152.4375	-2.1915	0	UDConS2
Top (+2 Axis) End-J	269.0521	-1.5457	0	UDConS2
Bot (-2 Axis) End-I	59.1459	1.5457	0	UDConS2
Bot (-2 Axis) Middle	199.0833	1.5457	0	UDConS2
Bot (-2 Axis) End-J	292.375	6.183	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.616	4	0.887	199.0833	1.766	245.7292
UDConS1		UDConS1		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.7793	292.375	2.7793	292.375
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B34	34	2B-21	167.8299	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.3716	0.29	0.36	0.28	0.4521	0.35
Bot (-2 Axis)	0.36	0.28	0.3675	0.29	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-21.6604	0	UDConS2
Top (+2 Axis) Middle	104.8937	-6.5276	0	UDConS2
Top (+2 Axis) End-J	165.8299	-26.1102	0	UDConS2
Bot (-2 Axis) End-I	41.9575	13.8122	0	UDConS2
Bot (-2 Axis) Middle	83.915	21.4326	0	UDConS2
Bot (-2 Axis) End-J	125.8724	14.7159	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.0207

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
8.372	4	2.894	62.9362	9.923	165.8299
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.0499	41.9575	2.0499	41.9575
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B35	35	2B-21	26.9826	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.465	0.36	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-26.8172	0	UDConS2
Top (+2 Axis) Middle	14.4913	-15.5326	0	UDConS2
Top (+2 Axis) End-J	26.9826	-4.4214	0	UDConS2
Bot (-2 Axis) End-I	2	13.4086	0	UDConS2
Bot (-2 Axis) Middle	14.4913	6.7043	0	UDConS2
Bot (-2 Axis) End-J	26.9826	2.2107	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.0405	0.0372	0.0339

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
10.924	2	10.757	14.4913	10.591	26.9826
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.2187	26.9826	1.2187	26.9826
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B36	36	2B-23	67.4281	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	24	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.5733	0.3	0.5733	0.3	0	0
Bot (-2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-5.9596	0	UDConS2
Top (+2 Axis) Middle	33.7141	-2.4866	0	UDConS4
Top (+2 Axis) End-J	59.4281	0	0	UDConS6
Bot (-2 Axis) End-I	12	2.9798	0	UDConS2
Bot (-2 Axis) Middle	46.5711	1.4899	0	UDConS2
Bot (-2 Axis) End-J	59.4281	1.736	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.916	12	2.482	33.7141	1.707	59.4281
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1609	0.6706

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
5.1919	59.4281	5.1919	59.4281
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B37	37	2B-23	63.8219	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	24	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.5733	0.3	0.5733	0.3
Bot (-2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	31.911	-6.0496	0	UDConS2
Top (+2 Axis) End-J	51.8219	-23.8818	0	UDConS2
Bot (-2 Axis) End-I	0	24.1984	0	UDConS2
Bot (-2 Axis) Middle	15.9555	12.4806	0	UDConS2
Bot (-2 Axis) End-J	51.8219	11.9409	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0.0003	0.0052

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
8.653	0	14.156	31.911	14.554	51.8219
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1609	0.6706

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
5.1154	31.911	5.1154	31.911
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B38	38	2B-19	163.75	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	38	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.9467	0.31	0.9467	0.31	0.9467	0.31
Bot (-2 Axis)	0.9467	0.31	0.9467	0.31	0.9467	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	40.9375	-14.0241	0	UDConS2
Top (+2 Axis) Middle	102.3438	-14.0241	0	UDConS2
Top (+2 Axis) End-J	151.75	-56.0963	0	UDConS2
Bot (-2 Axis) End-I	40.9375	14.0241	0	UDConS2
Bot (-2 Axis) Middle	102.3438	14.0241	0	UDConS2
Bot (-2 Axis) End-J	151.75	28.0481	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.298	12	7.192	102.3438	12.581	151.75
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1668	1.084

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.0687	81.875	2.0687	81.875
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B39	39	2B-24	182.625	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	45	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.1333	0.31	1.1333	0.31	1.1333	0.31
Bot (-2 Axis)	1.1333	0.31	1.1333	0.31	1.1333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	45.6563	-4.9172	0	UDConS3
Top (+2 Axis) Middle	114.1406	-4.9172	0	UDConS3
Top (+2 Axis) End-J	170.625	-19.6687	0	UDConS3
Bot (-2 Axis) End-I	45.6563	15.4632	0	UDConS2
Bot (-2 Axis) Middle	91.3125	24.4077	0	UDConS2
Bot (-2 Axis) End-J	136.9688	11.62	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.619	6	3.707	114.1406	10.462	170.625
UDConS1		UDConS3		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1687	1.2937

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
7.8142	170.625	7.8142	170.625
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B40	40	TB-1	79.5	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-0.2104	-0.211	UDConS3
Top (+2 Axis) Middle	28.75	-0.0526	-0.211	UDConS3
Top (+2 Axis) End-J	49.5	-0.0176	-0.16	UDConS3
Bot (-2 Axis) End-I	8	0.1052	-0.211	UDConS3
Bot (-2 Axis) Middle	28.75	0.193	-0.136	UDConS3
Bot (-2 Axis) End-J	49.5	0.0514	-0.135	UDConS5

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.334	8	0.127	28.75	0.251	49.5
UDConS4		UDConS4		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1551	0.336

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.0211	49.5	0.0211	49.5
UDConS5		UDConS5	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B41	41	2B-14	153.1248	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	27	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.6533	0.3	0.6533	0.3	1.2032	0.56
Bot (-2 Axis)	0.8381	0.39	0.6809	0.32	0.6533	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	19.1406	-30.7681	0	UDConS2
Top (+2 Axis) Middle	95.703	-30.7681	0	UDConS2
Top (+2 Axis) End-J	141.1248	-123.0724	0	UDConS2
Bot (-2 Axis) End-I	0	87.7522	0	UDConS2
Bot (-2 Axis) Middle	38.2812	72.0031	0	UDConS2
Bot (-2 Axis) End-J	141.1248	61.5362	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0.0638	0.2188

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.937	19.1406	21.961	95.703	36.205	141.1248
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1625	0.7581

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.0583	114.8436	3.0583	114.8436
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B42	42	2B-14	157.0357	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	27	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.2322	0.57	0.6533	0.3	0.6533	0.3
Bot (-2 Axis)	0.6533	0.3	0.7306	0.34	0.8386	0.39

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-125.801	0	UDConS2
Top (+2 Axis) Middle	117.7768	-31.4503	0	UDConS2
Top (+2 Axis) End-J	137.4062	-31.4503	0	UDConS2
Bot (-2 Axis) End-I	12	62.9005	0	UDConS2
Bot (-2 Axis) Middle	117.7768	77.0171	0	UDConS2
Bot (-2 Axis) End-J	157.0357	87.8029	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.2557	0.0691	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
39.598	12	22.456	58.8884	3.349	137.4062
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1625	0.7581

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.5989	39.2589	3.5989	39.2589
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B43	43	2B-15	176.6444	0.963	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-24.8932	0	UDConS4
Top (+2 Axis) Middle	132.4833	-6.2233	0	UDConS4
Top (+2 Axis) End-J	176.6444	-12.647	0	UDConS3
Bot (-2 Axis) End-I	44.1611	57.9019	0	UDConS2
Bot (-2 Axis) Middle	88.3222	105.7029	0	UDConS2
Bot (-2 Axis) End-J	154.5638	51.0211	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
30.322	12	22.422	132.4833	24.924	176.6444
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
8.5545	176.6444	8.5545	176.6444
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B44	44	2B-15	59.8428	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-6.5531	0	UDConS5
Top (+2 Axis) Middle	29.9214	-8.0493	0	UDConS3
Top (+2 Axis) End-J	47.8428	-27.6449	0	UDConS3
Bot (-2 Axis) End-I	0	15.2061	0	UDConS4
Bot (-2 Axis) Middle	14.9607	10.3709	0	UDConS6
Bot (-2 Axis) End-J	47.8428	13.8225	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
3.471	0	17.588	29.9214	18.603	47.8428
UDConS4		UDConS4		UDConS4	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
7.2007	47.8428	7.2007	47.8428
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B45	45	2B-37	67	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-1.6076	0	UDConS2
Top (+2 Axis) Middle	48.25	-0.4019	0	UDConS2
Top (+2 Axis) End-J	63	-0.5025	0	UDConS1
Bot (-2 Axis) End-I	4	0.8038	0	UDConS2
Bot (-2 Axis) Middle	33.5	0.9043	0	UDConS2
Bot (-2 Axis) End-J	63	0.2512	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.186	4	0.99	18.75	0.733	63
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.1497	63	0.1497	63
UDConS3		UDConS3	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B46	46	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0646	0	UDConS6
Top (+2 Axis) Middle	35.9708	-0.2492	0	UDConS3
Top (+2 Axis) End-J	59.9416	-0.9969	0	UDConS3
Bot (-2 Axis) End-I	0	0.406	0	UDConS3
Bot (-2 Axis) Middle	35.9708	0.9889	0	UDConS2
Bot (-2 Axis) End-J	59.9416	0.4985	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.456	0	0.819	35.9708	1.059	59.9416
UDConS4		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.1111	35.9708	0.1111	35.9708
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B47	47	2B-38	134	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	32	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7867	0.31	0.7867	0.31	0.7867	0.31
Bot (-2 Axis)	0.7867	0.31	0.7867	0.31	0.7867	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	28.0884	-24.4353	0	UDConS1
Top (+2 Axis) Middle	87.217	-43.6588	0	UDConS1
Top (+2 Axis) End-J	130	-97.7413	0	UDConS1
Bot (-2 Axis) End-I	28.0884	24.4353	0	UDConS1
Bot (-2 Axis) Middle	87.217	24.4353	0	UDConS1
Bot (-2 Axis) End-J	130	48.8707	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.194	28.0884	12.356	87.217	15.97	126.3779
UDConS1		UDConS1		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1646	0.9055

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.1386	130	3.1386	130
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B48	48	2B-38	420.1875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	32	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.811	0.32	0.7867	0.31	0.7867	0.31
Bot (-2 Axis)	0.7867	0.31	0.7867	0.31	0.7867	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-103.3049	0	UDConS1
Top (+2 Axis) Middle	293.3669	-25.8262	0	UDConS1
Top (+2 Axis) End-J	416.1875	-77.1275	0	UDConS1
Bot (-2 Axis) End-I	4	51.6524	0	UDConS1
Bot (-2 Axis) Middle	212.9814	87.0156	0	UDConS1
Bot (-2 Axis) End-J	416.1875	38.5637	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.0018	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
19.589	4	10.899	112.6069	14.609	392.3233
UDConS1		UDConS1		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1646	0.9055

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
9.5	11.9584	9.5	11.9584
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B49	49	TB-1	75.501	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-0.2751	0	UDConS2
Top (+2 Axis) Middle	54.6257	-0.4212	0	UDConS2
Top (+2 Axis) End-J	71.501	-1.6849	0	UDConS2
Bot (-2 Axis) End-I	4	0.1376	0	UDConS2
Bot (-2 Axis) Middle	37.7505	1.1969	0	UDConS2
Bot (-2 Axis) End-J	71.501	0.8425	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.564	4	0.984	54.6257	1.153	71.501
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.2997	37.7505	0.2997	37.7505
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B50	50	TB-1	72.375	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-0.5294	0	UDConS3
Top (+2 Axis) Middle	54.2813	-0.223	0	UDConS2
Top (+2 Axis) End-J	72.375	-0.8919	0	UDConS2
Bot (-2 Axis) End-I	2	0.2647	0	UDConS3
Bot (-2 Axis) Middle	36.1875	0.5208	0	UDConS2
Bot (-2 Axis) End-J	72.375	0.4459	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.395	2	0.441	54.2813	0.639	72.375
UDConS3		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.0356	36.1875	1.0356	36.1875
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B51	51	TB-1	41.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0	0
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.9195	0	UDConS4
Top (+2 Axis) Middle	19.9375	-0.8738	0	UDConS4
Top (+2 Axis) End-J	39.875	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.4597	0	UDConS4
Bot (-2 Axis) Middle	19.9375	0.8738	0	UDConS4
Bot (-2 Axis) End-J	39.875	3.4953	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.13	0	1.93	19.9375	1.731	39.875
UDConS4		UDConS4		UDConS4	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.5638	39.875	0.5638	39.875
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B52	52	2B-12	170.3549	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	21.2944	-55.2284	0	UDConS2
Top (+2 Axis) Middle	106.4718	-55.2284	0	UDConS2
Top (+2 Axis) End-J	148.0605	-55.2284	0	UDConS2
Bot (-2 Axis) End-I	0	220.9134	0	UDConS2
Bot (-2 Axis) Middle	42.5887	199.2233	0	UDConS2
Bot (-2 Axis) End-J	148.0605	55.2284	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
6.204	21.2944	25.647	106.4718	30.71	168.3549
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
13.903	127.7662	13.903	127.7662
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B53	53	2B-12	118.9642	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	20.8274	-54.9825	0	UDConS2
Top (+2 Axis) Middle	79.3095	-54.9825	0	UDConS2
Top (+2 Axis) End-J	99.1368	-54.9825	0	UDConS2
Bot (-2 Axis) End-I	20.8274	54.9825	0	UDConS2
Bot (-2 Axis) Middle	79.3095	147.8259	0	UDConS2
Bot (-2 Axis) End-J	118.9642	219.9302	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
30.866	2	29.019	39.6547	21.82	99.1368
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
12.179	79.3095	12.179	79.3095
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B54	54	TB-1	2.2393	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.9355	0.97			0.9352	0.97
Bot (-2 Axis)	0.4284	0.45			0.4283	0.45

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-34.1997	0	UDConS2
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	0.2393	-34.191	0	UDConS2
Bot (-2 Axis) End-I	0	17.0999	0	UDConS2
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	0.2393	17.0955	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.437	0			0.435	0.2393
UDConS2				UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B55	55	2B-12	26.4837	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-19.9303	0	UDConS2
Top (+2 Axis) Middle	13.2419	-30.0974	0	UDConS2
Top (+2 Axis) End-J	26.4837	-41.0924	0	UDConS2
Bot (-2 Axis) End-I	0	9.9652	0	UDConS2
Bot (-2 Axis) Middle	13.2419	10.2731	0	UDConS2
Bot (-2 Axis) End-J	26.4837	20.5462	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
9.27	0	10.145	13.2419	11.021	26.4837
UDConS1		UDConS1		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
7.4227	26.4837	7.4227	26.4837
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B56	56	2B-12	154.1426	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	19.2678	-5.0885	0	UDConS3
Top (+2 Axis) Middle	115.607	-5.0885	0	UDConS3
Top (+2 Axis) End-J	154.1426	-18.9998	0	UDConS2
Bot (-2 Axis) End-I	19.2678	23.8912	0	UDConS3
Bot (-2 Axis) Middle	38.5357	25.7594	0	UDConS3
Bot (-2 Axis) End-J	154.1426	9.4999	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.499	0	6.02	115.607	8.203	154.1426
UDConS4		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.5163	154.1426	2.5163	154.1426
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B57	57	2B-12	30.2116	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	68	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32
Bot (-2 Axis)	1.7467	0.32	1.7467	0.32	1.7467	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-11.3889	0	UDConS4
Top (+2 Axis) Middle	16.1058	-4.194	0	UDConS3
Top (+2 Axis) End-J	30.2116	-0.2058	0	UDConS6
Bot (-2 Axis) End-I	2	5.6944	0	UDConS4
Bot (-2 Axis) Middle	16.1058	5.0888	0	UDConS3
Bot (-2 Axis) End-J	30.2116	16.776	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
11.141	2	10.342	16.1058	9.543	30.2116
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1729	1.9883

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.2928	30.2116	2.2928	30.2116
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B58	58	2B-35	154.3498	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	24	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3
Bot (-2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-3.7504	0	UDConS2
Top (+2 Axis) Middle	111.7033	-0.961	0	UDConS4
Top (+2 Axis) End-J	152.3498	-3.8439	0	UDConS4
Bot (-2 Axis) End-I	37.2344	3.1686	0	UDConS2
Bot (-2 Axis) Middle	74.4689	2.1721	0	UDConS2
Bot (-2 Axis) End-J	152.3498	1.922	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.607	2	0.979	111.7033	1.862	152.3498
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1609	0.6706

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.8123	148.9377	2.8123	148.9377
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B59	59	2B-35	103.2572	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	24	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3
Bot (-2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-4.18	0	UDConS1
Top (+2 Axis) Middle	68.8381	-1.045	0	UDConS1
Top (+2 Axis) End-J	101.2572	-2.986	0	UDConS3
Bot (-2 Axis) End-I	19.2095	2.1355	0	UDConS4
Bot (-2 Axis) Middle	34.4191	7.5424	0	UDConS4
Bot (-2 Axis) End-J	101.2572	1.493	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.798	4	4.19	34.4191	2.252	101.2572
UDConS2		UDConS2		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1609	0.6706

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.7615	68.8381	1.7615	68.8381
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B60	60	2B-10	80.0969	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-0.7508	0	UDConS4
Top (+2 Axis) Middle	54.0727	-0.2456	0	UDConS2
Top (+2 Axis) End-J	68.0969	-0.9825	0	UDConS2
Bot (-2 Axis) End-I	12	0.3754	0	UDConS4
Bot (-2 Axis) Middle	40.0485	2.3271	0	UDConS3
Bot (-2 Axis) End-J	68.0969	0.4913	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.524	12	1.414	54.0727	1.796	68.0969
UDConS1		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.9765	40.0485	0.9765	40.0485
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B61	61	2B-10	80.6573	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-2.3881	0	UDConS4
Top (+2 Axis) Middle	26.1643	-0.9506	0	UDConS4
Top (+2 Axis) End-J	68.6573	-1.1123	0	UDConS3
Bot (-2 Axis) End-I	12	1.1941	0	UDConS4
Bot (-2 Axis) Middle	40.3287	0.597	0	UDConS4
Bot (-2 Axis) End-J	68.6573	0.5561	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.468	12	1.055	26.1643	0.835	68.6573
UDConS1		UDConS1		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.5883	40.3287	0.5883	40.3287
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B62	62	2B-10	118.4188	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	21.7365	-0.6291	0	UDConS1
Top (+2 Axis) Middle	78.9459	-0.6291	0	UDConS1
Top (+2 Axis) End-J	106.4188	-2.5164	0	UDConS1
Bot (-2 Axis) End-I	21.7365	3.0914	0	UDConS2
Bot (-2 Axis) Middle	39.4729	4.9942	0	UDConS2
Bot (-2 Axis) End-J	106.4188	1.2582	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.071	4	2.053	78.9459	2.821	106.4188
UDConS1		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.4142	39.4729	0.4142	39.4729
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B63	63	2B-11	72.375	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-2.6561	0	UDConS4
Top (+2 Axis) Middle	45.8996	-0.664	0	UDConS4
Top (+2 Axis) End-J	64.375	-0.7832	0	UDConS3
Bot (-2 Axis) End-I	8	1.328	0	UDConS4
Bot (-2 Axis) Middle	45.8996	0.664	0	UDConS4
Bot (-2 Axis) End-J	61.1995	0.664	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.588	8	1.023	30.5998	1.683	64.375
UDConS4		UDConS4		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.735	61.1995	0.735	61.1995
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B64	64	TB-1	82.75	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-1.3045	0	UDConS4
Top (+2 Axis) Middle	62.0625	-0.5101	0	UDConS3
Top (+2 Axis) End-J	82.75	-2.0406	0	UDConS3
Bot (-2 Axis) End-I	24.6875	0.7784	0	UDConS2
Bot (-2 Axis) Middle	41.375	2.49	0	UDConS2
Bot (-2 Axis) End-J	82.75	1.0203	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.391	8	1.26	62.0625	1.467	82.75
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.8137	41.375	0.8137	41.375
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B65	65	2B-14	138.4336	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	27	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.6533	0.3	0.6533	0.3	0.6533	0.3
Bot (-2 Axis)	0.6533	0.3	0.6533	0.3	0.6533	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-21.6068	0	UDConS2
Top (+2 Axis) Middle	92.2891	-5.4017	0	UDConS2
Top (+2 Axis) End-J	126.4336	-7.4996	0	UDConS3
Bot (-2 Axis) End-I	4	10.8034	0	UDConS2
Bot (-2 Axis) Middle	92.2891	12.983	0	UDConS2
Bot (-2 Axis) End-J	109.3613	5.4017	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
7.39	4	6.442	46.1445	7.093	126.4336
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1625	0.7581

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.2127	46.1445	3.2127	46.1445
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B66	66	2B-14	72.375	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	27	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.6533	0.3	0.6533	0.3
Bot (-2 Axis)	0.6533	0.3	0.6533	0.3	0.6533	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	36.1875	-5.822	0	UDConS2
Top (+2 Axis) End-J	68.375	-23.2882	0	UDConS2
Bot (-2 Axis) End-I	0	6.0354	0	UDConS2
Bot (-2 Axis) Middle	36.1875	5.822	0	UDConS2
Bot (-2 Axis) End-J	68.375	11.6441	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
3.348	0	6.223	36.1875	6.947	68.375
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1625	0.7581

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.2583	36.1875	0.2583	36.1875
UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B67	67	TB-1	73	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0	0
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.9241	0	UDConS2
Top (+2 Axis) Middle	18.25	-1.6631	0	UDConS2
Top (+2 Axis) End-J	73	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.9621	0	UDConS2
Bot (-2 Axis) Middle	54.75	0.981	0	UDConS2
Bot (-2 Axis) End-J	73	0.2769	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.578	0	1.395	18.25	0.275	73
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.1891	36.5	0.1891	36.5
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B68	68	TB-1	59.1599	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.8839	0	UDConS4
Top (+2 Axis) Middle	35.875	-0.5344	0	UDConS3
Top (+2 Axis) End-J	59.1599	-2.1378	0	UDConS3
Bot (-2 Axis) End-I	0	0.442	0	UDConS4
Bot (-2 Axis) Middle	35.875	1.3398	0	UDConS2
Bot (-2 Axis) End-J	59.1599	1.0689	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.856	0	1.257	35.875	1.49	59.1599
UDConS4		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.5018	59.1599	1.5018	59.1599
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B70	69	2B-26	26.6475	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28			0	0
Bot (-2 Axis)	0.36	0.28			0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-5.4712	0	UDConS3
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	26.6475	0	0	UDConS6
Bot (-2 Axis) End-I	4	2.7356	0	UDConS3
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	26.6475	9.6255	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
8.145	4			7.843	26.6475
UDConS3				UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.8879	26.6475	0.8879	26.6475
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B71	70	2B-25	161.7275	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-7.8861	0	UDConS4
Top (+2 Axis) Middle	101.0797	-2.7469	0	UDConS3
Top (+2 Axis) End-J	153.7275	-10.9876	0	UDConS3
Bot (-2 Axis) End-I	40.4319	13.4451	0	UDConS2
Bot (-2 Axis) Middle	80.8638	16.729	0	UDConS2
Bot (-2 Axis) End-J	153.7275	5.4938	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
7.702	8	4.041	101.0797	4.874	153.7275
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.4447	153.7275	3.4447	153.7275
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B72	71	2B-36	277.9098	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-1.1161	0	UDConS4
Top (+2 Axis) Middle	208.4323	-1.0547	0	UDConS3
Top (+2 Axis) End-J	254.7506	-1.0547	0	UDConS3
Bot (-2 Axis) End-I	46.3183	1.6497	0	UDConS4
Bot (-2 Axis) Middle	208.4323	1.0547	0	UDConS3
Bot (-2 Axis) End-J	277.9098	4.2186	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.066	4	0.57	92.6366	1.529	231.5915
UDConS4		UDConS1		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.1828	46.3183	1.1828	46.3183
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B73	72	2B-36	23.8401	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0			0.36	0.28
Bot (-2 Axis)	0.4307	0.34			0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	19.8401	-1.5626	0	UDConS3
Bot (-2 Axis) End-I	0	24.9382	0	UDConS3
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	19.8401	0.7813	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.1386		0.1439

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
15.892	0			16.156	19.8401
UDConS3				UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.004	19.8401	2.004	19.8401
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B74	73	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2807	0.29	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-11.4784	0	UDConS2
Top (+2 Axis) Middle	17.9854	-8.3471	0	UDConS2
Top (+2 Axis) End-J	71.9416	-1.8574	0	UDConS2
Bot (-2 Axis) End-I	0	5.7392	0	UDConS2
Bot (-2 Axis) Middle	35.9708	2.8696	0	UDConS2
Bot (-2 Axis) End-J	71.9416	0.9287	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.179	0	1.999	17.9854	0.982	71.9416
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.3105	35.9708	0.3105	35.9708
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B75	74	2B-9	172.1211	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	48	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32
Bot (-2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	21.5151	-14.6027	0	UDConS2
Top (+2 Axis) Middle	107.5757	-14.6027	0	UDConS2
Top (+2 Axis) End-J	146.606	-14.6027	0	UDConS2
Bot (-2 Axis) End-I	21.5151	68.0614	0	UDConS2
Bot (-2 Axis) Middle	43.0303	76.2852	0	UDConS2
Bot (-2 Axis) End-J	129.0908	25.3515	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.813	0	10.442	107.5757	13.499	164.1211
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1695	1.3839

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
17.7604	164.1211	17.7604	164.1211
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B76	75	2B-9	62.9373	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	48	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.2133	0.32	1.2133	0.32	0	0
Bot (-2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	11	-123.0639	0	UDConS2
Top (+2 Axis) Middle	31.4687	-42.9476	0	UDConS2
Top (+2 Axis) End-J	62.9373	0	0	UDConS6
Bot (-2 Axis) End-I	11	61.5319	0	UDConS2
Bot (-2 Axis) Middle	47.203	30.766	0	UDConS2
Bot (-2 Axis) End-J	62.9373	63.1298	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.1024	0.0976	0.0531

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
47.379	11	46.56	31.4687	38.973	62.9373
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1695	1.3839

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
11.6098	62.9373	11.6098	62.9373
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B77	76	2B-9	101.8753	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	48	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32
Bot (-2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	20.6016	-28.815	0	UDConS2
Top (+2 Axis) Middle	61.8047	-28.815	0	UDConS2
Top (+2 Axis) End-J	90.8753	-115.2601	0	UDConS2
Bot (-2 Axis) End-I	0	94.0191	0	UDConS2
Bot (-2 Axis) Middle	61.8047	28.815	0	UDConS2
Bot (-2 Axis) End-J	90.8753	57.6301	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.1411

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
20.602	20.6016	28.404	61.8047	53.982	90.8753
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1695	1.3839

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
15.7544	41.2031	15.7544	41.2031
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B78	77	2B-9	135.3008	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	48	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32
Bot (-2 Axis)	1.2133	0.32	1.2133	0.32	1.2133	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-47.3099	0	UDConS2
Top (+2 Axis) Middle	90.2005	-22.1511	0	UDConS2
Top (+2 Axis) End-J	112.7507	-22.1511	0	UDConS2
Bot (-2 Axis) End-I	8	23.6549	0	UDConS2
Bot (-2 Axis) Middle	90.2005	63.0758	0	UDConS2
Bot (-2 Axis) End-J	135.3008	88.6044	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
19.109	8	17.625	45.1003	6.793	112.7507
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1695	1.3839

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
9.6748	45.1003	9.6748	45.1003
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B79	78	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.2459	0	UDConS1
Top (+2 Axis) Middle	44.5886	-0.246	0	UDConS1
Top (+2 Axis) End-J	66.8829	-0.85	0	UDConS1
Bot (-2 Axis) End-I	0	0.123	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.2125	0	UDConS1
Bot (-2 Axis) End-J	66.8829	0.425	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.217	0	0.217	44.5886	0.434	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B80	79	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.6081	0	UDConS1
Top (+2 Axis) Middle	24	-0.152	0	UDConS1
Top (+2 Axis) End-J	48	-0.1349	0	UDConS1
Bot (-2 Axis) End-I	0	0.304	0	UDConS1
Bot (-2 Axis) Middle	24	0.152	0	UDConS1
Bot (-2 Axis) End-J	48	0.0675	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.352	0	0.118	24	0.115	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B81	80	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.1278	0	UDConS1
Top (+2 Axis) Middle	44.5886	-0.6583	0	UDConS1
Top (+2 Axis) End-J	66.8829	-1.5276	0	UDConS1
Bot (-2 Axis) End-I	0	0.0639	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.3819	0	UDConS1
Bot (-2 Axis) End-J	66.8829	0.7638	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.074	0	0.36	44.5886	0.576	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B82	81	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.0184	0	UDConS1
Top (+2 Axis) Middle	24	-0.3073	0	UDConS1
Top (+2 Axis) End-J	48	-0.063	0	UDConS1
Bot (-2 Axis) End-I	0	0.5092	0	UDConS1
Bot (-2 Axis) Middle	24	0.2546	0	UDConS1
Bot (-2 Axis) End-J	48	0.0315	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.472	0	0.239	24	0.026	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B83	82	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0771	0	UDConS1
Top (+2 Axis) Middle	44.5886	-1.0917	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.2031	0	UDConS1
Bot (-2 Axis) End-I	0	0.0385	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.5508	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.1016	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.056	0	0.49	44.5886	0.707	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B84	83	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.298	0	UDConS1
Top (+2 Axis) Middle	24	-0.4794	0	UDConS1
Top (+2 Axis) End-J	48	-0.1275	0	UDConS1
Bot (-2 Axis) End-I	0	0.649	0	UDConS1
Bot (-2 Axis) Middle	24	0.3245	0	UDConS1
Bot (-2 Axis) End-J	48	0.0637	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.526	0	0.293	24	0.07	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B85	84	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.058	0	UDConS1
Top (+2 Axis) Middle	44.5886	-1.5337	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.8756	0	UDConS1
Bot (-2 Axis) End-I	0	0.029	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.7189	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.4378	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.18	0	0.614	44.5886	0.831	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B86	85	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.4707	0	UDConS1
Top (+2 Axis) Middle	24	-0.5606	0	UDConS1
Top (+2 Axis) End-J	48	-0.1171	0	UDConS1
Bot (-2 Axis) End-I	0	0.7353	0	UDConS1
Bot (-2 Axis) Middle	24	0.3677	0	UDConS1
Bot (-2 Axis) End-J	48	0.0586	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.572	0	0.338	24	0.109	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B87	86	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.002	0	UDConS5
Top (+2 Axis) Middle	44.5886	-2.02	0	UDConS1
Top (+2 Axis) End-J	66.8829	-3.6338	0	UDConS1
Bot (-2 Axis) End-I	0	0.0031	0	UDConS4
Bot (-2 Axis) Middle	44.5886	0.9084	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.8169	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.327	0	0.76	44.5886	0.977	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B88	87	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.3666	0	UDConS1
Top (+2 Axis) Middle	24	-0.4668	0	UDConS1
Top (+2 Axis) End-J	48	-0.0336	0	UDConS1
Bot (-2 Axis) End-I	0	0.6833	0	UDConS1
Bot (-2 Axis) Middle	24	0.3416	0	UDConS1
Bot (-2 Axis) End-J	48	0.0506	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.567	0	0.333	24	0.101	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B89	88	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-2.6491	0	UDConS1
Top (+2 Axis) End-J	66.8829	-4.7321	0	UDConS1
Bot (-2 Axis) End-I	0	0.3088	0	UDConS1
Bot (-2 Axis) Middle	44.5886	1.183	0	UDConS1
Bot (-2 Axis) End-J	66.8829	2.3661	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.579	0	1.013	44.5886	1.23	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B90	89	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.4619	0	UDConS1
Top (+2 Axis) Middle	24	-0.1155	0	UDConS1
Top (+2 Axis) End-J	48	-0.1352	0	UDConS1
Bot (-2 Axis) End-I	0	0.2309	0	UDConS1
Bot (-2 Axis) Middle	24	0.1155	0	UDConS1
Bot (-2 Axis) End-J	48	0.0676	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.315	0	0.082	24	0.152	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B91	90	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-2.4078	0	UDConS1
Top (+2 Axis) End-J	66.8829	-4.3367	0	UDConS1
Bot (-2 Axis) End-I	0	0.242	0	UDConS1
Bot (-2 Axis) Middle	44.5886	1.0842	0	UDConS1
Bot (-2 Axis) End-J	66.8829	2.1684	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.496	0	0.93	44.5886	1.147	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B92	91	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.5044	0	UDConS1
Top (+2 Axis) Middle	24	-0.1261	0	UDConS1
Top (+2 Axis) End-J	48	-0.0089	0	UDConS6
Bot (-2 Axis) End-I	0	0.2522	0	UDConS1
Bot (-2 Axis) Middle	24	0.1261	0	UDConS1
Bot (-2 Axis) End-J	48	0.0698	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.358	0	0.125	24	0.121	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B93	92	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.6407	0	UDConS1
Top (+2 Axis) End-J	66.8829	-3.076	0	UDConS1
Bot (-2 Axis) End-I	0	0.0316	0	UDConS2
Bot (-2 Axis) Middle	44.5886	0.769	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.538	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.231	0	0.664	44.5886	0.881	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B94	93	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.687	0	UDConS1
Top (+2 Axis) Middle	24	-0.1717	0	UDConS1
Top (+2 Axis) End-J	48	-0.0722	0	UDConS1
Bot (-2 Axis) End-I	0	0.3435	0	UDConS1
Bot (-2 Axis) Middle	24	0.1717	0	UDConS1
Bot (-2 Axis) End-J	48	0.0364	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.387	0	0.154	24	0.096	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B95	94	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.1926	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.3933	0	UDConS1
Bot (-2 Axis) End-I	0	0.013	0	UDConS2
Bot (-2 Axis) Middle	44.5886	0.5983	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.1966	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.104	0	0.538	44.5886	0.755	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B96	95	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.5597	0	UDConS1
Top (+2 Axis) Middle	24	-0.1399	0	UDConS1
Top (+2 Axis) End-J	48	-0.0429	0	UDConS1
Bot (-2 Axis) End-I	0	0.2799	0	UDConS1
Bot (-2 Axis) Middle	24	0.1399	0	UDConS1
Bot (-2 Axis) End-J	48	0.0823	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.363	0	0.129	24	0.116	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B97	96	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.9381	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.0209	0	UDConS1
Bot (-2 Axis) End-I	0	0.0284	0	UDConS2
Bot (-2 Axis) Middle	44.5886	0.5052	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.0105	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.041	0	0.474	44.5886	0.691	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B98	97	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.4577	0	UDConS1
Top (+2 Axis) Middle	24	-0.1144	0	UDConS1
Top (+2 Axis) End-J	48	-0.204	0	UDConS1
Bot (-2 Axis) End-I	0	0.2288	0	UDConS1
Bot (-2 Axis) Middle	24	0.1144	0	UDConS1
Bot (-2 Axis) End-J	48	0.102	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.297	0	0.063	24	0.177	48
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B99	98	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.8441	0	UDConS1
Top (+2 Axis) End-J	66.8829	-1.8916	0	UDConS1
Bot (-2 Axis) End-I	0	0.0461	0	UDConS2
Bot (-2 Axis) Middle	44.5886	0.4729	0	UDConS1
Bot (-2 Axis) End-J	66.8829	0.9458	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.022	0	0.455	44.5886	0.672	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B100	99	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.4531	0	UDConS1
Top (+2 Axis) Middle	24	-0.3874	0	UDConS1
Top (+2 Axis) End-J	48	-0.7884	0	UDConS1
Bot (-2 Axis) End-I	0	0.2265	0	UDConS1
Bot (-2 Axis) Middle	24	0.1971	0	UDConS1
Bot (-2 Axis) End-J	48	0.3942	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.149	0	0.129	24	0.329	48
UDConS1		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B101	100	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.8836	0	UDConS1
Top (+2 Axis) End-J	66.8829	-1.9612	0	UDConS1
Bot (-2 Axis) End-I	0	0.0637	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.4903	0	UDConS1
Bot (-2 Axis) End-J	66.8829	0.9806	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.038	0	0.472	44.5886	0.688	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B102	101	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.7386	0	UDConS1
Top (+2 Axis) Middle	24	-0.6053	0	UDConS1
Top (+2 Axis) End-J	48	-0.9387	0	UDConS1
Bot (-2 Axis) End-I	0	0.3693	0	UDConS1
Bot (-2 Axis) Middle	24	0.2347	0	UDConS1
Bot (-2 Axis) End-J	48	0.4693	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.183	0	0.082	24	0.283	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B103	102	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.9977	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.1365	0	UDConS1
Bot (-2 Axis) End-I	0	0.0719	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.5341	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.0683	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.071	0	0.505	44.5886	0.721	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B104	103	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.0565	0	UDConS1
Top (+2 Axis) Middle	24	-0.8243	0	UDConS1
Top (+2 Axis) End-J	48	-1.0587	0	UDConS1
Bot (-2 Axis) End-I	0	0.5283	0	UDConS1
Bot (-2 Axis) Middle	24	0.2647	0	UDConS1
Bot (-2 Axis) End-J	48	0.5293	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.233	0	0.024	24	0.234	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B105	104	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.1281	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.3325	0	UDConS1
Bot (-2 Axis) End-I	0	0.0725	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.5831	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.1663	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.106	0	0.54	44.5886	0.757	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B106	105	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.3915	0	UDConS1
Top (+2 Axis) Middle	24	-1.0567	0	UDConS1
Top (+2 Axis) End-J	48	-1.1886	0	UDConS1
Bot (-2 Axis) End-I	0	0.6957	0	UDConS1
Bot (-2 Axis) Middle	24	0.3479	0	UDConS1
Bot (-2 Axis) End-J	48	0.5943	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.284	0	0.051	24	0.183	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B107	106	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.2291	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.4829	0	UDConS1
Bot (-2 Axis) End-I	0	0.0704	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.6207	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.2414	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.133	0	0.566	44.5886	0.783	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B108	107	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.5921	0	UDConS1
Top (+2 Axis) Middle	24	-1.2427	0	UDConS1
Top (+2 Axis) End-J	48	-1.3598	0	UDConS1
Bot (-2 Axis) End-I	0	0.7961	0	UDConS1
Bot (-2 Axis) Middle	24	0.398	0	UDConS1
Bot (-2 Axis) End-J	48	0.6799	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.291	0	0.058	24	0.175	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B109	108	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.2765	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.5546	0	UDConS1
Bot (-2 Axis) End-I	0	0.0718	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.6387	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.2773	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.147	0	0.58	44.5886	0.796	66.8829
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B110	109	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.6969	0	UDConS1
Top (+2 Axis) Middle	24	-1.3069	0	UDConS2
Top (+2 Axis) End-J	48	-1.3751	0	UDConS1
Bot (-2 Axis) End-I	0	0.8485	0	UDConS1
Bot (-2 Axis) Middle	24	0.4242	0	UDConS1
Bot (-2 Axis) End-J	48	0.6875	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.314	0	0.08	24	0.153	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B111	110	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.2582	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.5338	0	UDConS1
Bot (-2 Axis) End-I	0	0.0849	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.6334	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.2669	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.146	0	0.578	44.5886	0.795	66.8829
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B112	111	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.7124	0	UDConS1
Top (+2 Axis) Middle	24	-1.2388	0	UDConS2
Top (+2 Axis) End-J	48	-1.2307	0	UDConS1
Bot (-2 Axis) End-I	0	0.8562	0	UDConS1
Bot (-2 Axis) Middle	24	0.4281	0	UDConS1
Bot (-2 Axis) End-J	48	0.6154	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.354	0	0.12	24	0.113	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B113	112	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-1.1623	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.4026	0	UDConS1
Bot (-2 Axis) End-I	0	0.1104	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.6007	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.2013	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.126	0	0.559	44.5886	0.776	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B114	113	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.5956	0	UDConS1
Top (+2 Axis) Middle	24	-1.0805	0	UDConS1
Top (+2 Axis) End-J	48	-1.0322	0	UDConS1
Bot (-2 Axis) End-I	0	0.7978	0	UDConS1
Bot (-2 Axis) Middle	24	0.3989	0	UDConS1
Bot (-2 Axis) End-J	48	0.5161	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.374	0	0.144	24	0.092	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B115	114	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.9901	0	UDConS1
Top (+2 Axis) End-J	66.8829	-2.1622	0	UDConS1
Bot (-2 Axis) End-I	0	0.146	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.5406	0	UDConS1
Bot (-2 Axis) End-J	66.8829	1.0811	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.089	0	0.523	44.5886	0.739	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B116	115	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.3112	0	UDConS1
Top (+2 Axis) Middle	24	-0.8725	0	UDConS1
Top (+2 Axis) End-J	48	-0.9005	0	UDConS1
Bot (-2 Axis) End-I	0	0.6556	0	UDConS1
Bot (-2 Axis) Middle	24	0.3278	0	UDConS1
Bot (-2 Axis) End-J	48	0.4502	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.336	0	0.104	24	0.131	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B117	116	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.7163	0	UDConS1
Top (+2 Axis) End-J	66.8829	-1.7705	0	UDConS1
Bot (-2 Axis) End-I	0	0.1839	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.4426	0	UDConS1
Bot (-2 Axis) End-J	66.8829	0.8852	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.026	0	0.459	44.5886	0.676	66.8829
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B118	117	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.8844	0	UDConS1
Top (+2 Axis) Middle	24	-0.5463	0	UDConS1
Top (+2 Axis) End-J	48	-0.6749	0	UDConS1
Bot (-2 Axis) End-I	0	0.4422	0	UDConS1
Bot (-2 Axis) Middle	24	0.2211	0	UDConS1
Bot (-2 Axis) End-J	48	0.3375	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.286	0	0.052	24	0.181	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B119	118	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.395	0	UDConS1
Top (+2 Axis) End-J	66.8829	-1.3007	0	UDConS1
Bot (-2 Axis) End-I	0	0.2083	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.3252	0	UDConS1
Bot (-2 Axis) End-J	66.8829	0.6503	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.07	0	0.379	44.5886	0.596	66.8829
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B120	119	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.5253	0	UDConS1
Top (+2 Axis) Middle	24	-0.1405	0	UDConS1
Top (+2 Axis) End-J	48	-0.2225	0	UDConS1
Bot (-2 Axis) End-I	0	0.2626	0	UDConS1
Bot (-2 Axis) Middle	24	0.1313	0	UDConS1
Bot (-2 Axis) End-J	48	0.1112	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.309	0	0.076	24	0.158	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B121	120	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.1861	0	UDConS1
Top (+2 Axis) End-J	66.8829	-0.7443	0	UDConS1
Bot (-2 Axis) End-I	0	0.206	0	UDConS1
Bot (-2 Axis) Middle	22.2943	0.3348	0	UDConS2
Bot (-2 Axis) End-J	66.8829	0.3721	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.175	0	0.279	44.5886	0.496	66.8829
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B122	121	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0008	0	UDConS6
Top (+2 Axis) Middle	24	-0.0853	0	UDConS1
Top (+2 Axis) End-J	48	-0.341	0	UDConS1
Bot (-2 Axis) End-I	0	0.1796	0	UDConS2
Bot (-2 Axis) Middle	24	0.1811	0	UDConS2
Bot (-2 Axis) End-J	48	0.1705	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.146	0	0.099	24	0.32	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B123	122	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	44.5886	-0.0589	0	UDConS2
Top (+2 Axis) End-J	66.8829	-0.1314	0	UDConS1
Bot (-2 Axis) End-I	0	0.1498	0	UDConS1
Bot (-2 Axis) Middle	44.5886	0.5428	0	UDConS2
Bot (-2 Axis) End-J	66.8829	0.2357	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.299	0	0.159	44.5886	0.376	66.8829
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B124	123	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.1188	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.4753	0	UDConS2
Bot (-2 Axis) Middle	24	0.6464	0	UDConS2
Bot (-2 Axis) End-J	48	0.4175	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.229	0	0.014	24	0.238	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B125	124	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0586	0	UDConS2
Top (+2 Axis) Middle	44.5886	-0.2356	0	UDConS2
Top (+2 Axis) End-J	66.8829	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.0293	0	UDConS2
Bot (-2 Axis) Middle	44.5886	0.954	0	UDConS2
Bot (-2 Axis) End-J	66.8829	0.9425	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.458	0	0.273	22.2943	0.217	66.8829
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B126	125	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.1894	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.744	0	UDConS2
Bot (-2 Axis) Middle	24	0.9507	0	UDConS2
Bot (-2 Axis) End-J	48	0.7574	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.242	0	0.009	24	0.225	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B127	126	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.4076	0	UDConS2
Top (+2 Axis) Middle	44.5886	-0.4033	0	UDConS2
Top (+2 Axis) End-J	66.8829	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.2038	0	UDConS2
Bot (-2 Axis) Middle	44.5886	1.2848	0	UDConS2
Bot (-2 Axis) End-J	66.8829	1.6132	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.641	0	0.455	22.2943	0.084	66.8829
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B128	127	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.2082	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.8329	0	UDConS2
Bot (-2 Axis) Middle	24	0.8358	0	UDConS2
Bot (-2 Axis) End-J	48	0.4388	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.136	0	0.099	24	0.33	48
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B129	128	TRELLIS	66.8829	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.9669	0	UDConS2
Top (+2 Axis) Middle	44.5886	-0.5182	0	UDConS2
Top (+2 Axis) End-J	66.8829	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.4834	0	UDConS2
Bot (-2 Axis) Middle	44.5886	1.4049	0	UDConS2
Bot (-2 Axis) End-J	66.8829	2.073	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.824	0	0.638	22.2943	0.267	66.8829
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B130	129	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.1362	0	UDConS2
Top (+2 Axis) End-J	48	-0.0623	0	UDConS1
Bot (-2 Axis) End-I	0	0.545	0	UDConS2
Bot (-2 Axis) Middle	24	0.51	0	UDConS2
Bot (-2 Axis) End-J	48	0.0751	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.103	0	0.13	24	0.363	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B131	130	2B-8	166.1179	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-28.5442	0	UDConS2
Top (+2 Axis) Middle	103.8237	-7.136	0	UDConS2
Top (+2 Axis) End-J	158.1179	-14.4549	0	UDConS2
Bot (-2 Axis) End-I	41.5295	20.3463	0	UDConS2
Bot (-2 Axis) Middle	83.059	35.6444	0	UDConS2
Bot (-2 Axis) End-J	124.5884	20.2413	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
16.538	8	4.922	62.2942	11.805	158.1179
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
4.3351	158.1179	4.3351	158.1179
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B132	131	2B-7	251.6019	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	24	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3
Bot (-2 Axis)	0.5733	0.3	0.5733	0.3	0.5733	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-6.6612	0	UDConS4
Top (+2 Axis) Middle	176.4858	-1.6653	0	UDConS4
Top (+2 Axis) End-J	230.5293	-1.6653	0	UDConS4
Bot (-2 Axis) End-I	41.9337	4.5525	0	UDConS2
Bot (-2 Axis) Middle	68.7201	2.5482	0	UDConS2
Bot (-2 Axis) End-J	209.6683	6.6779	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.937	12.6019	1.229	176.4858	2.582	243.6019
UDConS4		UDConS1		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1649	0.6872

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.2093	41.9337	0.2093	41.9337
UDConS4		UDConS4	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B133	132	2B-6	178.38	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-28.0931	0	UDConS1
Top (+2 Axis) Middle	117.7832	-7.0233	0	UDConS1
Top (+2 Axis) End-J	170.38	-22.0856	0	UDConS1
Bot (-2 Axis) End-I	8	14.0466	0	UDConS1
Bot (-2 Axis) Middle	98.7157	16.9561	0	UDConS2
Bot (-2 Axis) End-J	170.38	11.0428	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
8.679	13.9374	6.845	56.0077	10.339	170.38
UDConS1		UDConS1		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.7622	56.0077	1.7622	56.0077
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B134	133	TRELLIS	1067.501	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	251.8525	-1.4777	0	UDConS2
Top (+2 Axis) Middle	715.5057	-1.9992	0	UDConS2
Top (+2 Axis) End-J	1067.501	-1.3944	0	UDConS1
Bot (-2 Axis) End-I	41	1.6147	0	UDConS2
Bot (-2 Axis) Middle	439.8796	2.3854	0	UDConS2
Bot (-2 Axis) End-J	862.2509	1.9959	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.366	63.0654	1.22	800.2841	1.189	819.3516
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B135	134	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.5768	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.9764	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.7884	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.8942	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.2254	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.041	0	0.842	20.3998	0.446	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B136	135	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.2387	0	UDConS1
Top (+2 Axis) End-J	48	-0.9548	0	UDConS1
Bot (-2 Axis) End-I	0	0.3452	0	UDConS2
Bot (-2 Axis) Middle	24	0.2387	0	UDConS1
Bot (-2 Axis) End-J	48	0.4774	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.098	0	0.309	24	0.542	48
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B137	136	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.0732	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.3445	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	2.0366	0	UDConS1
Bot (-2 Axis) Middle	40.7997	1.0183	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1313	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.116	0	0.918	20.3998	0.555	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B138	137	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.2659	0	UDConS1
Top (+2 Axis) End-J	48	-1.0634	0	UDConS1
Bot (-2 Axis) End-I	0	0.3776	0	UDConS2
Bot (-2 Axis) Middle	24	0.2659	0	UDConS1
Bot (-2 Axis) End-J	48	0.5317	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.108	0	0.341	24	0.575	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B139	138	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.4594	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.0103	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1401	0	UDConS2
Bot (-2 Axis) End-I	0	1.7297	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.8648	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.07	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.952	0	0.753	20.3998	0.359	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B140	139	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.8269	0	UDConS1
Top (+2 Axis) End-J	48	-2.5399	0	UDConS2
Bot (-2 Axis) End-I	0	0.5083	0	UDConS2
Bot (-2 Axis) Middle	24	0.635	0	UDConS2
Bot (-2 Axis) End-J	48	1.27	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.562	0	0.762	24	0.962	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B141	140	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.1883	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.8352	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1632	0	UDConS2
Bot (-2 Axis) End-I	0	1.5941	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7971	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0816	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.895	0	0.697	20.3998	0.3	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B142	141	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.4598	0	UDConS2
Top (+2 Axis) End-J	48	-3.7187	0	UDConS2
Bot (-2 Axis) End-I	0	0.399	0	UDConS2
Bot (-2 Axis) Middle	24	0.9297	0	UDConS2
Bot (-2 Axis) End-J	48	1.8593	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.829	0	1.029	24	1.229	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B143	142	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.9169	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.6627	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1921	0	UDConS2
Bot (-2 Axis) End-I	0	1.4585	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7292	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0961	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.837	0	0.639	20.3998	0.242	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B144	143	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.9978	0	UDConS2
Top (+2 Axis) End-J	48	-4.7294	0	UDConS2
Bot (-2 Axis) End-I	0	0.3338	0	UDConS2
Bot (-2 Axis) Middle	24	1.1823	0	UDConS2
Bot (-2 Axis) End-J	48	2.3647	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.066	0	1.266	24	1.466	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B145	144	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.8938	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.6378	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1575	0	UDConS2
Bot (-2 Axis) End-I	0	1.4469	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7235	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0787	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.838	0	0.64	20.3998	0.243	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B146	145	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-2.3045	0	UDConS2
Top (+2 Axis) End-J	48	-5.2052	0	UDConS2
Bot (-2 Axis) End-I	0	0.1963	0	UDConS2
Bot (-2 Axis) Middle	24	1.3013	0	UDConS2
Bot (-2 Axis) End-J	48	2.6026	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.15	0	1.35	24	1.55	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B147	146	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.8066	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.5906	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1926	0	UDConS2
Bot (-2 Axis) End-I	0	1.4033	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7017	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0963	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.814	0	0.616	20.3998	0.219	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B148	147	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-2.4692	0	UDConS2
Top (+2 Axis) End-J	48	-5.5877	0	UDConS2
Bot (-2 Axis) End-I	0	0.2494	0	UDConS2
Bot (-2 Axis) Middle	24	1.3969	0	UDConS2
Bot (-2 Axis) End-J	48	2.7939	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.259	0	1.459	24	1.659	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B149	148	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.9121	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.6661	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.2087	0	UDConS2
Bot (-2 Axis) End-I	0	1.4561	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.728	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1043	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.832	0	0.634	20.3998	0.237	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B150	149	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-2.4705	0	UDConS2
Top (+2 Axis) End-J	48	-5.4696	0	UDConS2
Bot (-2 Axis) End-I	0	0.1286	0	UDConS2
Bot (-2 Axis) Middle	24	1.3674	0	UDConS2
Bot (-2 Axis) End-J	48	2.7348	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.2	0	1.4	24	1.6	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B151	150	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.1647	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.8334	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.21	0	UDConS2
Bot (-2 Axis) End-I	0	1.5824	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7912	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.105	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.882	0	0.684	20.3998	0.287	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B152	151	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-2.0866	0	UDConS2
Top (+2 Axis) End-J	48	-5.2819	0	UDConS2
Bot (-2 Axis) End-I	0	0.7087	0	UDConS2
Bot (-2 Axis) Middle	24	1.3205	0	UDConS2
Bot (-2 Axis) End-J	48	2.641	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.298	0	1.498	24	1.698	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B153	152	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.7168	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.1661	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1076	0	UDConS2
Bot (-2 Axis) End-I	0	1.8584	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.9292	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0538	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.011	0	0.813	20.3998	0.416	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B154	153	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.6446	0	UDConS2
Top (+2 Axis) End-J	48	-4.4227	0	UDConS2
Bot (-2 Axis) End-I	0	0.7336	0	UDConS2
Bot (-2 Axis) Middle	24	1.1057	0	UDConS2
Bot (-2 Axis) End-J	48	2.2113	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.089	0	1.289	24	1.489	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B155	154	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.9944	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.3394	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.0607	0	UDConS2
Bot (-2 Axis) End-I	0	1.9972	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.9986	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0304	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.073	0	0.874	20.3998	0.481	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B156	155	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.1113	0	UDConS2
Top (+2 Axis) End-J	48	-3.2674	0	UDConS2
Bot (-2 Axis) End-I	0	0.6448	0	UDConS2
Bot (-2 Axis) Middle	24	0.8169	0	UDConS2
Bot (-2 Axis) End-J	48	1.6337	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.778	0	0.978	24	1.178	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B157	156	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.6235	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.122	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.151	0	UDConS2
Bot (-2 Axis) End-I	0	1.8117	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.9059	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0755	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.982	0	0.784	20.3998	0.392	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B158	157	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.7159	0	UDConS1
Top (+2 Axis) End-J	48	-2.6058	0	UDConS2
Bot (-2 Axis) End-I	0	0.8798	0	UDConS2
Bot (-2 Axis) Middle	24	0.6514	0	UDConS2
Bot (-2 Axis) End-J	48	1.3029	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.671	0	0.871	24	1.071	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B159	158	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.1696	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.8261	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1682	0	UDConS2
Bot (-2 Axis) End-I	0	1.5848	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7924	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0841	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.89	0	0.691	20.3998	0.295	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B160	159	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.5348	0	UDConS1
Top (+2 Axis) End-J	48	-2.1391	0	UDConS1
Bot (-2 Axis) End-I	0	0.959	0	UDConS2
Bot (-2 Axis) Middle	24	0.5348	0	UDConS1
Bot (-2 Axis) End-J	48	1.0695	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.569	0	0.769	24	0.969	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B161	160	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.7266	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.5116	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.0999	0	UDConS2
Bot (-2 Axis) End-I	0	1.3633	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.6816	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.05	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.814	0	0.616	20.3998	0.219	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B162	161	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.4275	0	UDConS1
Top (+2 Axis) End-J	48	-1.7101	0	UDConS1
Bot (-2 Axis) End-I	0	0.9787	0	UDConS2
Bot (-2 Axis) Middle	24	0.4275	0	UDConS1
Bot (-2 Axis) End-J	48	0.855	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.455	0	0.655	24	0.855	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B163	162	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.3264	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.2076	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.1632	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.5816	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0314	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.757	0	0.559	20.3998	0.162	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B164	163	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.3278	0	UDConS1
Top (+2 Axis) End-J	48	-1.311	0	UDConS1
Bot (-2 Axis) End-I	0	0.9827	0	UDConS2
Bot (-2 Axis) Middle	24	0.3278	0	UDConS1
Bot (-2 Axis) End-J	48	0.6555	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.343	0	0.543	24	0.754	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B165	164	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.9083	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.8834	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.9541	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.4771	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1914	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.702	0	0.504	20.3998	0.107	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B166	165	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.2423	0	UDConS2
Top (+2 Axis) End-J	48	-0.8994	0	UDConS1
Bot (-2 Axis) End-I	0	0.969	0	UDConS2
Bot (-2 Axis) Middle	24	0.3314	0	UDConS2
Bot (-2 Axis) End-J	48	0.4497	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.219	0	0.419	24	0.652	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B167	166	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.4016	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.5018	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.7008	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.3504	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.344	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.629	0	0.43	20.3998	0.034	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B168	167	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.0575	0	UDConS2
Top (+2 Axis) End-J	48	-0.1678	0	UDConS1
Bot (-2 Axis) End-I	0	0.2298	0	UDConS2
Bot (-2 Axis) Middle	24	0.3864	0	UDConS2
Bot (-2 Axis) End-J	48	0.1429	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.178	0	0.08	24	0.313	48
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B169	168	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.76	0	UDConS1
Top (+2 Axis) Middle	40.7997	-0.19	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.38	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.579	0	UDConS2
Bot (-2 Axis) End-J	61.1995	0.4421	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.521	0	0.323	20.3998	0.165	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B170	169	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.224	0	UDConS2
Top (+2 Axis) Middle	24	-0.2064	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.112	0	UDConS2
Bot (-2 Axis) Middle	24	0.5008	0	UDConS2
Bot (-2 Axis) End-J	48	0.8256	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.462	0	0.262	24	0.068	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B171	170	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.8287	0	UDConS1
Top (+2 Axis) Middle	40.7997	-0.2072	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.4144	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.5216	0	UDConS2
Bot (-2 Axis) End-J	61.1995	0.4012	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.527	0	0.329	20.3998	0.156	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B172	171	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.2129	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.0432	0	UDConS2
Bot (-2 Axis) Middle	24	0.6475	0	UDConS2
Bot (-2 Axis) End-J	48	0.8517	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.402	0	0.202	24	0.117	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B173	172	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	0	0	UDConS6
Top (+2 Axis) Middle	42.133	-0.3279	0	UDConS2
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	4	1.3116	0	UDConS2
Bot (-2 Axis) Middle	23.0665	1.1823	0	UDConS2
Bot (-2 Axis) End-J	61.1995	0.2019	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.263	4	0.32	42.133	0.479	61.1995
UDConS1		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B174	173	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8.025	-0.2937	-0.003	UDConS2
Top (+2 Axis) Middle	26.0125	-0.0978	-0.003	UDConS2
Top (+2 Axis) End-J	44	0	0.115	UDConS6
Bot (-2 Axis) End-I	0	0.1109	-0.549	UDConS4
Bot (-2 Axis) Middle	26.0125	0.1611	-0.003	UDConS2
Bot (-2 Axis) End-J	44	0.3912	-0.003	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.378	8.025	0.228	26.0125	0.079	44
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B175	174	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.5006	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.5809	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.7503	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.3752	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.2987	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.64	0	0.442	20.3998	0.045	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B176	175	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.1107	0	UDConS2
Top (+2 Axis) End-J	48	-0.2615	0	UDConS1
Bot (-2 Axis) End-I	0	0.4427	0	UDConS2
Bot (-2 Axis) Middle	24	0.4363	0	UDConS2
Bot (-2 Axis) End-J	48	0.1307	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.097	0	0.149	24	0.382	48
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B177	176	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.0773	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.0087	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.0386	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.5193	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1443	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.728	0	0.529	20.3998	0.133	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B178	177	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.2634	0	UDConS1
Top (+2 Axis) End-J	48	-1.0536	0	UDConS1
Bot (-2 Axis) End-I	0	0.6992	0	UDConS2
Bot (-2 Axis) Middle	24	0.2634	0	UDConS1
Bot (-2 Axis) End-J	48	0.5268	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.195	0	0.398	24	0.631	48
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B179	178	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.5233	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.3434	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.2617	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.6308	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0104	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.793	0	0.595	20.3998	0.198	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B180	179	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.4042	0	UDConS1
Top (+2 Axis) End-J	48	-1.6168	0	UDConS1
Bot (-2 Axis) End-I	0	0.79	0	UDConS2
Bot (-2 Axis) Middle	24	0.4042	0	UDConS1
Bot (-2 Axis) End-J	48	0.8084	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.381	0	0.581	24	0.789	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B181	180	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.9122	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.6398	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1213	0	UDConS2
Bot (-2 Axis) End-I	0	1.4561	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.728	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0606	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.848	0	0.649	20.3998	0.253	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B182	181	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.5236	0	UDConS1
Top (+2 Axis) End-J	48	-2.0945	0	UDConS1
Bot (-2 Axis) End-I	0	0.8882	0	UDConS2
Bot (-2 Axis) Middle	24	0.5236	0	UDConS1
Bot (-2 Axis) End-J	48	1.0472	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.544	0	0.744	24	0.944	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B183	182	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.2476	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.8962	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.2346	0	UDConS2
Bot (-2 Axis) End-I	0	1.6238	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.8119	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1173	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.894	0	0.696	20.3998	0.303	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B184	183	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.6599	0	UDConS1
Top (+2 Axis) End-J	48	-2.5355	0	UDConS2
Bot (-2 Axis) End-I	0	0.9144	0	UDConS2
Bot (-2 Axis) Middle	24	0.6339	0	UDConS2
Bot (-2 Axis) End-J	48	1.2678	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.662	0	0.862	24	1.062	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B185	184	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.5424	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.1063	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.2796	0	UDConS2
Bot (-2 Axis) End-I	0	1.7712	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.8856	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1398	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.944	0	0.746	20.3998	0.358	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B186	185	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.8231	0	UDConS1
Top (+2 Axis) End-J	48	-2.842	0	UDConS2
Bot (-2 Axis) End-I	0	0.8567	0	UDConS2
Bot (-2 Axis) Middle	24	0.7105	0	UDConS2
Bot (-2 Axis) End-J	48	1.421	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.725	0	0.925	24	1.125	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B187	186	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.8594	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.3158	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.2729	0	UDConS2
Bot (-2 Axis) End-I	0	1.9297	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.9648	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1365	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.007	0	0.809	20.3998	0.425	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B188	187	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.9918	0	UDConS1
Top (+2 Axis) End-J	48	-3.1955	0	UDConS2
Bot (-2 Axis) End-I	0	0.8352	0	UDConS2
Bot (-2 Axis) Middle	24	0.7989	0	UDConS2
Bot (-2 Axis) End-J	48	1.5977	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.808	0	1.008	24	1.208	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B189	188	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.1352	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.4694	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1701	0	UDConS2
Bot (-2 Axis) End-I	0	2.0676	0	UDConS1
Bot (-2 Axis) Middle	40.7997	1.0338	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.085	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.079	0	0.881	20.3998	0.497	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B190	189	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.3315	0	UDConS2
Top (+2 Axis) End-J	48	-3.7778	0	UDConS2
Bot (-2 Axis) End-I	0	0.7148	0	UDConS2
Bot (-2 Axis) Middle	24	0.9445	0	UDConS2
Bot (-2 Axis) End-J	48	1.8889	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.923	0	1.123	24	1.323	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B191	190	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.0113	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.3473	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.043	0	UDConS2
Bot (-2 Axis) End-I	0	2.0057	0	UDConS1
Bot (-2 Axis) Middle	40.7997	1.0028	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0215	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.078	0	0.88	20.3998	0.483	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B192	191	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.8745	0	UDConS2
Top (+2 Axis) End-J	48	-4.8132	0	UDConS2
Bot (-2 Axis) End-I	0	0.6641	0	UDConS2
Bot (-2 Axis) Middle	24	1.2033	0	UDConS2
Bot (-2 Axis) End-J	48	2.4066	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.169	0	1.369	24	1.569	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B193	192	2B-1	179.1296	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-15.0029	0	UDConS1
Top (+2 Axis) Middle	117.6022	-8.3469	0	UDConS1
Top (+2 Axis) End-J	167.1296	-33.3878	0	UDConS1
Bot (-2 Axis) End-I	34.0332	8.6658	0	UDConS2
Bot (-2 Axis) Middle	75.0038	19.5183	0	UDConS2
Bot (-2 Axis) End-J	167.1296	16.6939	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
13.06	8	7.009	117.6022	9.164	159.4378
UDConS1		UDConS1		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
6.1469	117.6022	6.1469	117.6022
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B194	193	2B-3	232.918	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31
Bot (-2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-38.2725	0	UDConS1
Top (+2 Axis) Middle	168.0362	-12.8135	0	UDConS2
Top (+2 Axis) End-J	220.918	-51.2541	0	UDConS2
Bot (-2 Axis) End-I	12	19.1362	0	UDConS1
Bot (-2 Axis) Middle	128.3813	47.7017	0	UDConS2
Bot (-2 Axis) End-J	220.918	25.6271	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.0125

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
12.94	21.9553	12.635	168.0362	23.589	220.918
UDConS1		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1661	1.0244

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
10.9316	84.4083	10.9316	84.4083
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B195	194	2B-3	198.3275	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31
Bot (-2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-46.8796	0	UDConS2
Top (+2 Axis) Middle	127.4865	-11.7199	0	UDConS2
Top (+2 Axis) End-J	190.3275	-28.4539	0	UDConS1
Bot (-2 Axis) End-I	12	23.4398	0	UDConS2
Bot (-2 Axis) Middle	104.6749	29.2202	0	UDConS2
Bot (-2 Axis) End-J	190.3275	14.2269	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
20.707	12	10.079	61.7756	9.874	189.4533
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1661	1.0244

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
11.6846	169.5568	11.6846	169.5568
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B196	195	2B-4	198.3275	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31
Bot (-2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-52.5061	0	UDConS2
Top (+2 Axis) Middle	135.09	-13.1265	0	UDConS2
Top (+2 Axis) End-J	194.3275	-23.5568	0	UDConS1
Bot (-2 Axis) End-I	12	26.2531	0	UDConS2
Bot (-2 Axis) Middle	93.6302	30.0198	0	UDConS2
Bot (-2 Axis) End-J	175.3037	13.1265	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
19.174	12	8.943	72.6458	9.273	194.3275
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1661	1.0244

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
11.7753	175.3037	11.7753	175.3037
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B197	196	2B-4	232.918	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	36	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31
Bot (-2 Axis)	0.8933	0.31	0.8933	0.31	0.8933	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-23.0885	0	UDConS2
Top (+2 Axis) Middle	158.2071	-15.1361	0	UDConS2
Top (+2 Axis) End-J	220.918	-60.5444	0	UDConS2
Bot (-2 Axis) End-I	47.4917	21.287	0	UDConS2
Bot (-2 Axis) Middle	116.2678	58.2875	0	UDConS2
Bot (-2 Axis) End-J	220.918	30.2722	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.0324

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
14.335	12	12.329	158.2071	26.088	220.918
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1661	1.0244

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
10.8785	116.2678	10.8785	116.2678
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B198	197	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-1.8834	0	UDConS1
Top (+2 Axis) Middle	23.0665	-1.1179	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.5794	0	UDConS2
Bot (-2 Axis) End-I	4	0.9417	0	UDConS1
Bot (-2 Axis) Middle	42.133	0.4708	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.2897	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.574	4	0.389	23.0665	0.078	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B199	198	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2322	0.29
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	22	-2.8666	0	UDConS2
Top (+2 Axis) End-J	44	-7.4785	0	UDConS2
Bot (-2 Axis) End-I	0	1.4092	0	UDConS2
Bot (-2 Axis) Middle	22	1.8696	0	UDConS2
Bot (-2 Axis) End-J	44	3.7392	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.241	0	2.424	22	2.607	44
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B200	199	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.8991	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.2703	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.0342	0	UDConS2
Bot (-2 Axis) End-I	0	1.9495	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.9748	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0171	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.057	0	0.859	20.3998	0.462	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B201	200	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.9879	0	UDConS2
Top (+2 Axis) End-J	48	-4.9973	0	UDConS2
Bot (-2 Axis) End-I	0	0.6214	0	UDConS2
Bot (-2 Axis) Middle	24	1.2493	0	UDConS2
Bot (-2 Axis) End-J	48	2.4987	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.205	0	1.405	24	1.605	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B202	201	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.0893	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.4351	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1543	0	UDConS2
Bot (-2 Axis) End-I	0	2.0447	0	UDConS1
Bot (-2 Axis) Middle	40.7997	1.0223	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0772	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.072	0	0.874	20.3998	0.49	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B203	202	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.3233	0	UDConS2
Top (+2 Axis) End-J	48	-3.6781	0	UDConS2
Bot (-2 Axis) End-I	0	0.6315	0	UDConS2
Bot (-2 Axis) Middle	24	0.9195	0	UDConS2
Bot (-2 Axis) End-J	48	1.839	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.877	0	1.077	24	1.277	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B204	203	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.8588	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.3073	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.2421	0	UDConS2
Bot (-2 Axis) End-I	0	1.9294	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.9647	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1211	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.012	0	0.813	20.3998	0.429	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B205	204	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-1.0369	0	UDConS1
Top (+2 Axis) End-J	48	-3.1651	0	UDConS2
Bot (-2 Axis) End-I	0	0.7014	0	UDConS2
Bot (-2 Axis) Middle	24	0.7913	0	UDConS2
Bot (-2 Axis) End-J	48	1.5826	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.767	0	0.967	24	1.167	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B206	205	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.504	0	UDConS1
Top (+2 Axis) Middle	20.3998	-2.0667	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.228	0	UDConS2
Bot (-2 Axis) End-I	0	1.752	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.876	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.114	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.945	0	0.746	20.3998	0.357	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B207	206	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.8324	0	UDConS1
Top (+2 Axis) End-J	48	-2.7138	0	UDConS2
Bot (-2 Axis) End-I	0	0.7067	0	UDConS2
Bot (-2 Axis) Middle	24	0.6785	0	UDConS2
Bot (-2 Axis) End-J	48	1.3569	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.655	0	0.855	24	1.055	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B208	207	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.1617	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.8165	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.1522	0	UDConS2
Bot (-2 Axis) End-I	0	1.5809	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.7904	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0761	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.89	0	0.692	20.3998	0.296	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B209	208	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.699	0	UDConS1
Top (+2 Axis) End-J	48	-2.3397	0	UDConS2
Bot (-2 Axis) End-I	0	0.6318	0	UDConS2
Bot (-2 Axis) Middle	24	0.5849	0	UDConS2
Bot (-2 Axis) End-J	48	1.1699	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.543	0	0.743	24	0.943	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B210	209	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.7118	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.4769	0	UDConS1
Top (+2 Axis) End-J	61.1995	-0.0186	0	UDConS1
Bot (-2 Axis) End-I	0	1.3559	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.6779	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0093	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.826	0	0.627	20.3998	0.231	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B211	210	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	24	-0.5665	0	UDConS1
Top (+2 Axis) End-J	48	-1.8384	0	UDConS1
Bot (-2 Axis) End-I	0	0.3694	0	UDConS2
Bot (-2 Axis) Middle	24	0.4596	0	UDConS1
Bot (-2 Axis) End-J	48	0.9192	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.337	0	0.537	24	0.753	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B212	211	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.2214	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.1139	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.1107	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.5554	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1124	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.751	0	0.552	20.3998	0.156	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B213	212	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0989	0	UDConS1
Top (+2 Axis) Middle	24	-0.4672	0	UDConS1
Top (+2 Axis) End-J	48	-1.3022	0	UDConS1
Bot (-2 Axis) End-I	0	0.0494	0	UDConS1
Bot (-2 Axis) Middle	24	0.3256	0	UDConS1
Bot (-2 Axis) End-J	48	0.6511	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.083	0	0.301	24	0.534	48
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B214	213	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.4478	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.5619	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.7239	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.362	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.233	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.62	0	0.422	20.3998	0.037	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B215	214	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.5824	0	UDConS2
Top (+2 Axis) Middle	24	-0.3487	0	UDConS1
Top (+2 Axis) End-J	48	-0.5949	0	UDConS1
Bot (-2 Axis) End-I	0	0.2912	0	UDConS2
Bot (-2 Axis) Middle	24	0.1487	0	UDConS1
Bot (-2 Axis) End-J	48	0.2974	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.256	0	0.056	24	0.24	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B216	215	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.4794	0	UDConS1
Top (+2 Axis) Middle	40.7997	-0.1198	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.3701	0	UDConS2
Bot (-2 Axis) Middle	20.3998	0.5691	0	UDConS2
Bot (-2 Axis) End-J	61.1995	0.1169	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.414	0	0.216	20.3998	0.308	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B217	216	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.4226	0	UDConS2
Top (+2 Axis) Middle	24	-1.1077	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.7113	0	UDConS2
Bot (-2 Axis) Middle	24	0.8556	0	UDConS2
Bot (-2 Axis) End-J	48	0.8072	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.257	0	1.057	24	0.857	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B218	217	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.7485	0	UDConS1
Top (+2 Axis) Middle	40.7997	-0.1871	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.3743	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.4289	0	UDConS2
Bot (-2 Axis) End-J	61.1995	0.2031	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.484	0	0.285	20.3998	0.218	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B219	218	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.6226	0	UDConS2
Top (+2 Axis) Middle	13.8548	-2.4168	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.8113	0	UDConS2
Bot (-2 Axis) Middle	30.9274	0.4057	0	UDConS2
Bot (-2 Axis) End-J	48	0.9	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.535	0	1.308	13.8548	1.023	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B220	219	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.6206	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.6568	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.8103	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.4052	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.2933	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.666	0	0.468	20.3998	0.071	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B221	220	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.6749	0	UDConS2
Top (+2 Axis) Middle	13.8548	-0.9103	0	UDConS2
Top (+2 Axis) End-J	48	-0.6605	0	UDConS1
Bot (-2 Axis) End-I	0	0.3375	0	UDConS2
Bot (-2 Axis) Middle	30.9274	0.1687	0	UDConS2
Bot (-2 Axis) End-J	48	0.3303	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.108	0	0.311	13.8548	0.091	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B222	221	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.2819	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.1234	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.141	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.5705	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.2056	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.781	0	0.582	20.3998	0.186	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B223	222	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.2097	0	UDConS1
Top (+2 Axis) Middle	30.9274	-0.7613	0	UDConS1
Top (+2 Axis) End-J	48	-1.3653	0	UDConS1
Bot (-2 Axis) End-I	0	0.1049	0	UDConS1
Bot (-2 Axis) Middle	30.9274	0.3413	0	UDConS1
Bot (-2 Axis) End-J	48	0.6826	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.034	0	0.342	30.9274	0.508	48
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B224	223	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.5433	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.326	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.2717	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.6358	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.1024	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.815	0	0.617	20.3998	0.22	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B225	224	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0222	0	UDConS5
Top (+2 Axis) Middle	30.9274	-0.8263	0	UDConS1
Top (+2 Axis) End-J	48	-1.6364	0	UDConS1
Bot (-2 Axis) End-I	0	0.0258	0	UDConS2
Bot (-2 Axis) Middle	30.9274	0.4091	0	UDConS1
Bot (-2 Axis) End-J	48	0.8182	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.065	0	0.494	30.9274	0.652	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B226	225	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.5838	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.371	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.2919	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.6459	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0431	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.813	0	0.614	20.3998	0.227	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B227	226	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	30.9274	-0.8151	0	UDConS1
Top (+2 Axis) End-J	48	-1.71	0	UDConS1
Bot (-2 Axis) End-I	0	0.2188	0	UDConS2
Bot (-2 Axis) Middle	30.9274	0.4275	0	UDConS1
Bot (-2 Axis) End-J	48	0.855	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.137	0	0.567	30.9274	0.712	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B228	227	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.4468	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.2823	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.2234	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.6117	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0352	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.784	0	0.586	20.3998	0.204	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B229	228	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	30.9274	-0.7151	0	UDConS1
Top (+2 Axis) End-J	48	-1.5973	0	UDConS1
Bot (-2 Axis) End-I	0	0.3264	0	UDConS2
Bot (-2 Axis) Middle	30.9274	0.3993	0	UDConS1
Bot (-2 Axis) End-J	48	0.7987	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.156	0	0.558	30.9274	0.703	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B230	229	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.0909	0	UDConS1
Top (+2 Axis) Middle	20.3998	-1.0385	0	UDConS1
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.0454	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.5227	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0548	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.718	0	0.52	20.3998	0.146	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B231	230	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	30.9274	-0.5018	0	UDConS1
Top (+2 Axis) End-J	48	-1.2439	0	UDConS1
Bot (-2 Axis) End-I	0	0.2397	0	UDConS2
Bot (-2 Axis) Middle	30.9274	0.311	0	UDConS1
Bot (-2 Axis) End-J	48	0.6219	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.05	0	0.448	30.9274	0.605	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B232	231	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.6194	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.7243	0	UDConS2
Top (+2 Axis) End-J	61.1995	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.8097	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.4049	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0815	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.629	0	0.43	20.3998	0.067	61.1995
UDConS1		UDConS1		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B233	232	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	30.9274	-0.2488	0	UDConS1
Top (+2 Axis) End-J	48	-0.8724	0	UDConS1
Bot (-2 Axis) End-I	0	0.1434	0	UDConS4
Bot (-2 Axis) Middle	13.8548	0.2565	0	UDConS2
Bot (-2 Axis) End-J	48	0.4362	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.165	0	0.355	30.9274	0.521	48
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B234	233	TRELLIS	61.1995	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.8812	0	UDConS1
Top (+2 Axis) Middle	20.3998	-0.2793	0	UDConS2
Top (+2 Axis) End-J	61.1995	-0.0065	0	UDConS6
Bot (-2 Axis) End-I	0	0.4406	0	UDConS1
Bot (-2 Axis) Middle	40.7997	0.2203	0	UDConS1
Bot (-2 Axis) End-J	61.1995	0.0305	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.469	0	0.271	20.3998	0.126	61.1995
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B235	234	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	30.9274	-0.128	0	UDConS2
Top (+2 Axis) End-J	48	-0.3916	0	UDConS1
Bot (-2 Axis) End-I	0	0.5121	0	UDConS2
Bot (-2 Axis) Middle	13.8548	0.2167	0	UDConS3
Bot (-2 Axis) End-J	48	0.1958	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.249	0	0.364	13.8548	0.371	48
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B236	235	TRELLIS	64	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	18	-0.3466	0	UDConS1
Top (+2 Axis) Middle	48	-0.388	0	UDConS1
Top (+2 Axis) End-J	64	-1.3863	0	UDConS1
Bot (-2 Axis) End-I	18	0.4845	0	UDConS2
Bot (-2 Axis) Middle	32	0.5157	0	UDConS2
Bot (-2 Axis) End-J	64	0.6931	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.203	4	0.693	48	0.826	64
UDConS1		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B237	236	TRELLIS	508.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.4624	0	UDConS1
Top (+2 Axis) Middle	277.0133	-2.3731	0	UDConS2
Top (+2 Axis) End-J	383.1933	-1.9491	0	UDConS2
Bot (-2 Axis) End-I	125.1213	1.3611	0	UDConS2
Bot (-2 Axis) Middle	172.6129	3.7554	0	UDConS2
Bot (-2 Axis) End-J	508.875	2.8164	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.869	0	2.132	193.8973	1.409	466.0619
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B238	237	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	40.5833	-0.7897	0	UDConS2
Top (+2 Axis) End-J	60.875	-1.7194	0	UDConS2
Bot (-2 Axis) End-I	0	0.212	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.4299	0	UDConS2
Bot (-2 Axis) End-J	60.875	0.8597	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.127	0	0.465	40.5833	0.66	60.875
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B239	238	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.617	0	UDConS1
Top (+2 Axis) Middle	24	-0.8801	0	UDConS2
Top (+2 Axis) End-J	48	-1.5817	0	UDConS2
Bot (-2 Axis) End-I	0	0.3085	0	UDConS1
Bot (-2 Axis) Middle	24	0.3954	0	UDConS2
Bot (-2 Axis) End-J	48	0.7908	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.051	0	0.251	24	0.451	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B240	239	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	40.5833	-1.1839	0	UDConS2
Top (+2 Axis) End-J	60.875	-2.2656	0	UDConS1
Bot (-2 Axis) End-I	0	0.0941	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.5664	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.1328	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.209	0	0.563	40.5833	0.76	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B241	240	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.3465	0	UDConS2
Top (+2 Axis) Middle	24	-0.5192	0	UDConS2
Top (+2 Axis) End-J	48	-0.1297	0	UDConS1
Bot (-2 Axis) End-I	0	0.6732	0	UDConS2
Bot (-2 Axis) Middle	24	0.3366	0	UDConS2
Bot (-2 Axis) End-J	48	0.0649	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.537	0	0.314	24	0.114	48
UDConS1		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B242	241	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0491	0	UDConS2
Top (+2 Axis) Middle	40.5833	-1.4905	0	UDConS2
Top (+2 Axis) End-J	60.875	-2.6973	0	UDConS1
Bot (-2 Axis) End-I	0	0.0246	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.6743	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.3486	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.257	0	0.626	40.5833	0.823	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B243	242	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-1.8082	0	UDConS2
Top (+2 Axis) Middle	24	-0.571	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	0.9041	0	UDConS2
Bot (-2 Axis) Middle	24	0.4521	0	UDConS2
Bot (-2 Axis) End-J	48	0.2661	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.723	0	0.519	24	0.319	48
UDConS1		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B244	243	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.1586	0	UDConS2
Top (+2 Axis) Middle	40.5833	-1.7372	0	UDConS2
Top (+2 Axis) End-J	60.875	-3.0369	0	UDConS1
Bot (-2 Axis) End-I	0	0.0793	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.7592	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.5185	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.298	0	0.674	40.5833	0.871	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B245	244	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.2092	0	UDConS2
Top (+2 Axis) Middle	24	-0.6509	0	UDConS1
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.1046	0	UDConS2
Bot (-2 Axis) Middle	24	0.5523	0	UDConS2
Bot (-2 Axis) End-J	48	0.5098	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.88	0	0.68	24	0.48	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B246	245	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.26	0	UDConS2
Top (+2 Axis) Middle	40.5833	-1.9873	0	UDConS1
Top (+2 Axis) End-J	60.875	-3.3762	0	UDConS1
Bot (-2 Axis) End-I	0	0.13	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.8441	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.6881	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.342	0	0.723	40.5833	0.92	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B247	246	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.6196	0	UDConS2
Top (+2 Axis) Middle	24	-0.7779	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.3098	0	UDConS2
Bot (-2 Axis) Middle	24	0.6549	0	UDConS2
Bot (-2 Axis) End-J	48	0.6639	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.021	0	0.821	24	0.621	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B248	247	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.297	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.208	0	UDConS1
Top (+2 Axis) End-J	60.875	-3.688	0	UDConS1
Bot (-2 Axis) End-I	0	0.1485	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.922	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.844	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.395	0	0.777	40.5833	0.974	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B249	248	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.9835	0	UDConS2
Top (+2 Axis) Middle	24	-0.9512	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.4917	0	UDConS2
Bot (-2 Axis) Middle	24	0.7459	0	UDConS2
Bot (-2 Axis) End-J	48	0.6812	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.116	0	0.916	24	0.716	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B250	249	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.2596	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.3944	0	UDConS1
Top (+2 Axis) End-J	60.875	-3.982	0	UDConS1
Bot (-2 Axis) End-I	0	0.1298	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.9955	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.991	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.458	0	0.84	40.5833	1.038	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B251	250	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.4712	0	UDConS2
Top (+2 Axis) Middle	24	-1.2161	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.7356	0	UDConS2
Bot (-2 Axis) Middle	24	0.8678	0	UDConS2
Bot (-2 Axis) End-J	48	0.639	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.228	0	1.028	24	0.828	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B252	251	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.165	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.4071	0	UDConS1
Top (+2 Axis) End-J	60.875	-4.0431	0	UDConS1
Bot (-2 Axis) End-I	0	0.0825	0	UDConS2
Bot (-2 Axis) Middle	40.5833	1.0108	0	UDConS1
Bot (-2 Axis) End-J	60.875	2.0216	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.478	0	0.869	40.5833	1.066	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B253	252	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.3917	0	UDConS2
Top (+2 Axis) Middle	24	-1.7012	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	2.1959	0	UDConS2
Bot (-2 Axis) Middle	24	1.0979	0	UDConS2
Bot (-2 Axis) End-J	48	0.5893	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.445	0	1.245	24	1.045	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B254	253	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.3462	0	UDConS2
Top (+2 Axis) Middle	40.5833	-1.9428	0	UDConS1
Top (+2 Axis) End-J	60.875	-3.2768	0	UDConS1
Bot (-2 Axis) End-I	0	0.1731	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.8192	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.6384	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.296	0	0.69	40.5833	0.888	60.875
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B255	254	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-6.2799	0	UDConS2
Top (+2 Axis) Middle	24	-2.6253	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	3.1399	0	UDConS2
Bot (-2 Axis) Middle	24	1.57	0	UDConS2
Bot (-2 Axis) End-J	48	0.6293	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.927	0	1.727	24	1.527	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B256	255	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.3214	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.068	0	UDConS1
Top (+2 Axis) End-J	60.875	-3.4763	0	UDConS1
Bot (-2 Axis) End-I	0	0.1607	0	UDConS2
Bot (-2 Axis) Middle	40.5833	0.8691	0	UDConS1
Bot (-2 Axis) End-J	60.875	1.7381	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.34	0	0.734	40.5833	0.931	60.875
UDConS1		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B257	256	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-6.2353	0	UDConS2
Top (+2 Axis) Middle	24	-2.6136	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	3.1177	0	UDConS2
Bot (-2 Axis) Middle	24	1.5588	0	UDConS2
Bot (-2 Axis) End-J	48	0.6081	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.911	0	1.711	24	1.511	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B258	257	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.2005	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.6157	0	UDConS1
Top (+2 Axis) End-J	60.875	-4.341	0	UDConS1
Bot (-2 Axis) End-I	0	0.1002	0	UDConS2
Bot (-2 Axis) Middle	40.5833	1.0852	0	UDConS1
Bot (-2 Axis) End-J	60.875	2.1705	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.54	0	0.922	40.5833	1.119	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B259	258	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.4119	0	UDConS2
Top (+2 Axis) Middle	24	-1.7104	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	2.2059	0	UDConS2
Bot (-2 Axis) Middle	24	1.103	0	UDConS2
Bot (-2 Axis) End-J	48	0.5911	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.451	0	1.251	24	1.051	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B260	259	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.308	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.708	0	UDConS2
Top (+2 Axis) End-J	60.875	-4.3796	0	UDConS1
Bot (-2 Axis) End-I	0	0.154	0	UDConS2
Bot (-2 Axis) Middle	40.5833	1.0949	0	UDConS1
Bot (-2 Axis) End-J	60.875	2.1898	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.541	0	0.91	40.5833	1.107	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B261	260	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.7168	0	UDConS2
Top (+2 Axis) Middle	24	-1.3644	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.8584	0	UDConS2
Bot (-2 Axis) Middle	24	0.9292	0	UDConS2
Bot (-2 Axis) End-J	48	0.588	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.276	0	1.076	24	0.876	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B262	261	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.3233	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.7031	0	UDConS2
Top (+2 Axis) End-J	60.875	-4.3219	0	UDConS2
Bot (-2 Axis) End-I	0	0.1616	0	UDConS2
Bot (-2 Axis) Middle	40.5833	1.0805	0	UDConS2
Bot (-2 Axis) End-J	60.875	2.161	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.535	0	0.895	40.5833	1.092	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B263	262	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.3998	0	UDConS2
Top (+2 Axis) Middle	24	-1.1768	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.6999	0	UDConS2
Bot (-2 Axis) Middle	24	0.85	0	UDConS2
Bot (-2 Axis) End-J	48	0.6463	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.212	0	1.012	24	0.812	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B264	263	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.1939	0	UDConS2
Top (+2 Axis) Middle	40.5833	-2.6943	0	UDConS2
Top (+2 Axis) End-J	60.875	-4.3733	0	UDConS2
Bot (-2 Axis) End-I	0	0.097	0	UDConS2
Bot (-2 Axis) Middle	40.5833	1.0933	0	UDConS2
Bot (-2 Axis) End-J	60.875	2.1867	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.57	0	0.916	40.5833	1.114	60.875
UDConS2		UDConS1		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B265	264	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.2273	0	UDConS2
Top (+2 Axis) Middle	24	-1.0834	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.6137	0	UDConS2
Bot (-2 Axis) Middle	24	0.8068	0	UDConS2
Bot (-2 Axis) End-J	48	0.6605	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.172	0	0.972	24	0.772	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B266	265	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	40.5833	-2.6426	0	UDConS2
Top (+2 Axis) End-J	60.875	-4.4279	0	UDConS2
Bot (-2 Axis) End-I	0	0.07	0	UDConS2
Bot (-2 Axis) Middle	40.5833	1.107	0	UDConS2
Bot (-2 Axis) End-J	60.875	2.2139	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.633	0	0.971	40.5833	1.155	60.875
UDConS2		UDConS2		UDConS1	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B267	266	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.1096	0	UDConS2
Top (+2 Axis) Middle	24	-1.0423	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.5548	0	UDConS2
Bot (-2 Axis) Middle	24	0.7774	0	UDConS2
Bot (-2 Axis) End-J	48	0.625	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.134	0	0.934	24	0.734	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B268	267	TRELLIS	60.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.1369	0	UDConS1
Top (+2 Axis) Middle	45.6563	-2.7225	0	UDConS2
Top (+2 Axis) End-J	60.875	-4.477	0	UDConS2
Bot (-2 Axis) End-I	0	0.0685	0	UDConS1
Bot (-2 Axis) Middle	45.6563	1.1193	0	UDConS2
Bot (-2 Axis) End-J	60.875	2.2385	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.241	0	1.32	45.6563	1.447	60.875
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B269	268	TRELLIS	48	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	10	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2	0.25	0.2	0.25	0	0
Bot (-2 Axis)	0.2	0.25	0.2	0.25	0.2	0.25

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.3766	0	UDConS2
Top (+2 Axis) Middle	24	-0.907	0	UDConS2
Top (+2 Axis) End-J	48	0	0	UDConS6
Bot (-2 Axis) End-I	0	1.6883	0	UDConS2
Bot (-2 Axis) Middle	24	0.8442	0	UDConS2
Bot (-2 Axis) End-J	48	1.1627	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.335	0	1.135	24	0.935	48
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B270	269	2B-2	182.6504	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	26	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3
Bot (-2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-28.2463	0	UDConS2
Top (+2 Axis) Middle	114.1565	-7.0616	0	UDConS2
Top (+2 Axis) End-J	170.6504	-13.0283	0	UDConS2
Bot (-2 Axis) End-I	45.6626	15.7211	0	UDConS2
Bot (-2 Axis) Middle	91.3252	30.2594	0	UDConS2
Bot (-2 Axis) End-J	136.9878	16.9323	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
13.081	8	4.277	68.4939	10.088	170.6504
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.162	0.7288

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
4.4848	170.6504	4.4848	170.6504
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B271	270	TB-1	30.4962	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.3908	0	UDConS6
Top (+2 Axis) Middle	15.2481	-0.1754	0	UDConS3
Top (+2 Axis) End-J	30.4962	-0.5435	0	UDConS5
Bot (-2 Axis) End-I	0	0.7014	0	UDConS3
Bot (-2 Axis) Middle	15.2481	0.2071	0	UDConS2
Bot (-2 Axis) End-J	30.4962	0.5296	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.486	0	0.485	15.2481	0.637	30.4962
UDConS4		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.2411	30.4962	1.2411	30.4962
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B272	271	TB-1	30	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.2434	0	UDConS6
Top (+2 Axis) Middle	15	-0.3146	0	UDConS3
Top (+2 Axis) End-J	30	-0.9379	0	UDConS3
Bot (-2 Axis) End-I	0	1.2585	0	UDConS3
Bot (-2 Axis) Middle	15	0.3146	0	UDConS3
Bot (-2 Axis) End-J	30	0.469	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.729	0	0.879	15	1.029	30
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.4902	30	1.4902	30
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B273	272	TB-1	48.7746	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.4084	0	UDConS6
Top (+2 Axis) Middle	36.5809	-1.3278	0	UDConS3
Top (+2 Axis) End-J	48.7746	-2.4298	0	UDConS3
Bot (-2 Axis) End-I	0	0.7615	0	UDConS3
Bot (-2 Axis) Middle	36.5809	0.6075	0	UDConS3
Bot (-2 Axis) End-J	48.7746	1.2149	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.452	0	1.024	36.5809	1.146	48.7746
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.9845	24.3873	0.9845	24.3873
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B274	273	TB-1	39.1296	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.528	0	UDConS2
Top (+2 Axis) Middle	19.5648	-3.1892	0	UDConS2
Top (+2 Axis) End-J	39.1296	-4.1694	0	UDConS2
Bot (-2 Axis) End-I	0	1.264	0	UDConS2
Bot (-2 Axis) Middle	19.5648	1.0424	0	UDConS2
Bot (-2 Axis) End-J	39.1296	2.0847	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.371	0	0.567	19.5648	0.762	39.1296
UDConS3		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.783	39.1296	0.783	39.1296
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B275	274	TB-1	77.6296	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	38.8148	-0.841	0	UDConS2
Top (+2 Axis) End-J	65.6296	-3.3641	0	UDConS2
Bot (-2 Axis) End-I	0	1.0177	0	UDConS3
Bot (-2 Axis) Middle	38.8148	0.841	0	UDConS2
Bot (-2 Axis) End-J	65.6296	1.682	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.474	0	0.666	19.25	2.274	65.6296
UDConS3		UDConS3		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.7599	65.6296	0.7599	65.6296
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B276	347	2B-5	217.4567	0.964	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-59.8311	0	UDConS2
Top (+2 Axis) Middle	152.2197	-14.9578	0	UDConS2
Top (+2 Axis) End-J	209.4567	-56.0631	0	UDConS2
Bot (-2 Axis) End-I	8	29.9155	0	UDConS2
Bot (-2 Axis) Middle	86.9827	60.8533	0	UDConS2
Bot (-2 Axis) End-J	209.4567	28.0316	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.0525	0	0.049

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
23.494	8	11.63	65.237	23.126	209.4567
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.7487	43.4913	3.7487	43.4913
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B277	354	2B-28	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	6	-0.3455	0	UDConS4
Top (+2 Axis) Middle	47.3299	-0.0864	0	UDConS4
Top (+2 Axis) End-J	65.9416	-0.2743	0	UDConS3
Bot (-2 Axis) End-I	6	0.1727	0	UDConS4
Bot (-2 Axis) Middle	35.9708	0.4116	0	UDConS4
Bot (-2 Axis) End-J	65.9416	0.1372	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.342	6	0.259	22.9757	0.31	65.9416
UDConS4		UDConS4		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1566	0.3393

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.0093	35.9708	0.0093	35.9708
UDConS4		UDConS4	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B23	360	RB-2	158.4854	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-25.8992	0	UDConS2
Top (+2 Axis) Middle	99.0534	-6.4748	0	UDConS2
Top (+2 Axis) End-J	134.6747	-6.4748	0	UDConS2
Bot (-2 Axis) End-I	2	12.9496	0	UDConS2
Bot (-2 Axis) Middle	79.2427	16.1311	0	UDConS2
Bot (-2 Axis) End-J	118.8641	8.0303	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
10.842	2	9.901	39.6213	4.864	150.4854
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1744	0.9013

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
11.051	150.4854	11.051	150.4854
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B278	361	RB-1	114.0006	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-4.2351	0	UDConS4
Top (+2 Axis) Middle	76.0004	-1.6435	0	UDConS3
Top (+2 Axis) End-J	106.0006	-6.574	0	UDConS3
Bot (-2 Axis) End-I	23.0001	2.26	0	UDConS2
Bot (-2 Axis) Middle	38.0002	9.0654	0	UDConS2
Bot (-2 Axis) End-J	106.0006	3.287	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.557	8	5.287	76.0004	6.037	106.0006
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
9.869	106.0006	9.869	106.0006
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B279	369	RB-2	160.0771	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	40.0193	-5.9764	0	UDConS2
Top (+2 Axis) Middle	120.0578	-5.9764	0	UDConS2
Top (+2 Axis) End-J	158.0771	-23.9057	0	UDConS2
Bot (-2 Axis) End-I	40.0193	9.7336	0	UDConS2
Bot (-2 Axis) Middle	80.0386	17.1508	0	UDConS2
Bot (-2 Axis) End-J	158.0771	11.9529	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.467	6	8.37	120.0578	9.32	158.0771
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1647	0.8508

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
10.4325	40.0193	10.4325	40.0193
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B281	370	RB-4	131.25	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	80	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	2.0667	0.32	2.0667	0.32	2.0667	0.32
Bot (-2 Axis)	2.0667	0.32	2.0667	0.32	2.0667	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	23.875	-5.9292	0	UDConS2
Top (+2 Axis) Middle	87.5	-5.9292	0	UDConS2
Top (+2 Axis) End-J	123.25	-23.7169	0	UDConS2
Bot (-2 Axis) End-I	23.875	18.2836	0	UDConS2
Bot (-2 Axis) Middle	43.75	25.6158	0	UDConS2
Bot (-2 Axis) End-J	123.25	11.8584	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
6.785	4	7.666	87.5	10.05	123.25
UDConS1		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1743	2.3524

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
4.4173	43.75	4.4173	43.75
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B39	371	RB-5	182.625	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	6	-11.7539	0	UDConS2
Top (+2 Axis) Middle	114.1406	-9.1227	0	UDConS2
Top (+2 Axis) End-J	170.625	-36.4909	0	UDConS2
Bot (-2 Axis) End-I	45.6563	28.049	0	UDConS2
Bot (-2 Axis) Middle	91.3125	41.8016	0	UDConS2
Bot (-2 Axis) End-J	136.9688	19.7238	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0.0083

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
11.753	6	6.423	114.1406	18.93	170.625
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.7337	136.9688	2.7337	136.9688
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B40	376	TB-1	79.5	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-0.2854	0	UDConS4
Top (+2 Axis) Middle	23.875	-0.1856	0	UDConS4
Top (+2 Axis) End-J	39.75	-0.1856	0	UDConS4
Bot (-2 Axis) End-I	8	0.1427	0	UDConS4
Bot (-2 Axis) Middle	23.875	0.8032	0	UDConS3
Bot (-2 Axis) End-J	39.75	1.5731	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.792	8	0.633	23.875	1.088	49.5
UDConS4		UDConS4		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.1988	39.75	0.1988	39.75
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B67	377	TB-1	73	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-3.504	0	UDConS2
Top (+2 Axis) Middle	18.25	-2.2545	0	UDConS2
Top (+2 Axis) End-J	73	-1.9929	0	UDConS2
Bot (-2 Axis) End-I	0	1.752	0	UDConS2
Bot (-2 Axis) Middle	54.75	0.876	0	UDConS2
Bot (-2 Axis) End-J	73	0.9965	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.913	0	0.73	18.25	0.431	73
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.1617	36.5	0.1617	36.5
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B68	378	TB-1	59.1599	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.7237	0	UDConS4
Top (+2 Axis) Middle	44.3699	-0.5496	0	UDConS3
Top (+2 Axis) End-J	59.1599	-1.8813	0	UDConS3
Bot (-2 Axis) End-I	0	0.3618	0	UDConS4
Bot (-2 Axis) Middle	29.5799	1.623	0	UDConS2
Bot (-2 Axis) End-J	59.1599	0.9406	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.031	0	1.007	44.3699	1.154	59.1599
UDConS4		UDConS3		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.1328	59.1599	1.1328	59.1599
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B283	379	2B-26	161.7275	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	20.2159	-4.3301	0	UDConS2
Top (+2 Axis) Middle	121.2956	-4.3301	0	UDConS2
Top (+2 Axis) End-J	161.7275	-17.3205	0	UDConS2
Bot (-2 Axis) End-I	20.2159	4.3301	0	UDConS2
Bot (-2 Axis) Middle	121.2956	8.2818	0	UDConS2
Bot (-2 Axis) End-J	161.7275	8.6602	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.695	0	6.735	121.2956	7.274	161.7275
UDConS4		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.6091	40.4319	2.6091	40.4319
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B284	380	TB-1	23.125	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26			0.2533	0.26
Bot (-2 Axis)	0.2533	0.26			0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.3372	0	UDConS3
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	11.125	-0.9961	0	UDConS2
Bot (-2 Axis) End-I	0	0.1686	0	UDConS3
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	11.125	0.4981	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.727	0			0.838	11.125
UDConS4				UDConS4	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.1317	11.125	1.1317	11.125
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B283	381	RB-7	161.7275	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	40.4319	-5.222	0	UDConS2
Top (+2 Axis) Middle	101.0797	-5.222	0	UDConS2
Top (+2 Axis) End-J	153.7275	-20.8878	0	UDConS2
Bot (-2 Axis) End-I	40.4319	12.3014	0	UDConS2
Bot (-2 Axis) Middle	80.8638	17.6672	0	UDConS2
Bot (-2 Axis) End-J	153.7275	10.4439	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.681	6	3.79	101.0797	9.722	153.7275
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
6.6227	40.4319	6.6227	40.4319
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B75	385	RB-8	172.1211	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-5.377	0	UDConS4
Top (+2 Axis) Middle	107.5757	-2.6058	0	UDConS2
Top (+2 Axis) End-J	164.1211	-10.4233	0	UDConS2
Bot (-2 Axis) End-I	43.0303	18.8902	0	UDConS2
Bot (-2 Axis) Middle	86.0605	22.7834	0	UDConS2
Bot (-2 Axis) End-J	129.0908	8.9204	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
8.728	8	3.988	107.5757	6.498	164.1211
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.2019	1.0433

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
12.7931	164.1211	12.7931	164.1211
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B287	390	RB-9	86.077	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	0	0	UDConS6
Top (+2 Axis) Middle	60.5577	-2.7683	0	UDConS1
Top (+2 Axis) End-J	78.077	-8.3036	0	UDConS1
Bot (-2 Axis) End-I	8	3.0224	0	UDConS3
Bot (-2 Axis) Middle	43.0385	2.4743	0	UDConS2
Bot (-2 Axis) End-J	78.077	4.1518	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.404	8	3.636	60.5577	4.074	78.077
UDConS4		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
7.6254	43.0385	7.6254	43.0385
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B131	391	RB-9	166.1179	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-9.0704	0	UDConS2
Top (+2 Axis) Middle	103.8237	-6.2818	0	UDConS2
Top (+2 Axis) End-J	158.1179	-25.127	0	UDConS2
Bot (-2 Axis) End-I	41.5295	10.3026	0	UDConS2
Bot (-2 Axis) Middle	83.059	11.8664	0	UDConS2
Bot (-2 Axis) End-J	158.1179	12.5635	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
6.746	8	4.837	103.8237	6.647	158.1179
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
7.2327	158.1179	7.2327	158.1179
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B288	394	RB-8	164.8126	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	41.2031	-1.1488	0	UDConS1
Top (+2 Axis) Middle	82.4063	-18.4997	0	UDConS2
Top (+2 Axis) End-J	156.8126	-4.5951	0	UDConS1
Bot (-2 Axis) End-I	41.2031	3.7329	0	UDConS2
Bot (-2 Axis) Middle	103.0079	1.1488	0	UDConS1
Bot (-2 Axis) End-J	123.6095	2.4086	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.001	41.2031	6.611	82.4063	5.212	123.6095
UDConS2		UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B289	395	RB-8	170.8747	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-6.0612	0	UDConS2
Top (+2 Axis) Middle	106.7967	-1.5153	0	UDConS2
Top (+2 Axis) End-J	145.5154	-1.5153	0	UDConS2
Bot (-2 Axis) End-I	42.7187	6.1658	0	UDConS2
Bot (-2 Axis) Middle	85.4373	19.118	0	UDConS2
Bot (-2 Axis) End-J	128.156	18.0445	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.571	8	3.638	64.078	5.982	162.8747
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
9.6903	85.4373	9.6903	85.4373
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B74	397	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.3716	0.39	0.2699	0.28	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-14.9713	0	UDConS2
Top (+2 Axis) Middle	17.9854	-11.057	0	UDConS2
Top (+2 Axis) End-J	71.9416	-1.441	0	UDConS4
Bot (-2 Axis) End-I	0	7.4856	0	UDConS2
Bot (-2 Axis) Middle	35.9708	3.7428	0	UDConS2
Bot (-2 Axis) End-J	71.9416	0.7205	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.702	0	2.522	17.9854	1.73	71.9416
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.3234	71.9416	0.3234	71.9416
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B49	398	TB-1	75.501	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-0.2474	0	UDConS4
Top (+2 Axis) Middle	54.6257	-0.3155	0	UDConS2
Top (+2 Axis) End-J	71.501	-1.262	0	UDConS2
Bot (-2 Axis) End-I	4	0.1237	0	UDConS4
Bot (-2 Axis) Middle	37.7505	0.5992	0	UDConS2
Bot (-2 Axis) End-J	71.501	0.631	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.445	4	0.608	54.6257	0.777	71.501
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.0887	37.7505	0.0887	37.7505
UDConS3		UDConS3	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B52	402	RB-10	170.3549	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	26	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3
Bot (-2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	22.2944	-7.0943	0	UDConS2
Top (+2 Axis) Middle	106.4718	-7.0943	0	UDConS2
Top (+2 Axis) End-J	158.3549	-28.3771	0	UDConS2
Bot (-2 Axis) End-I	22.2944	11.8961	0	UDConS2
Bot (-2 Axis) Middle	42.5887	19.6568	0	UDConS2
Bot (-2 Axis) End-J	158.3549	14.1885	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.092	2	6.182	106.4718	7.97	158.3549
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1809	0.8141

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
9.7304	158.3549	9.7304	158.3549
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B56	403	RB-10	154.1426	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	26	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3
Bot (-2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	38.5357	-4.0524	0	UDConS2
Top (+2 Axis) Middle	115.607	-13.4577	0	UDConS2
Top (+2 Axis) End-J	152.1426	-16.2095	0	UDConS2
Bot (-2 Axis) End-I	38.5357	5.7858	0	UDConS3
Bot (-2 Axis) Middle	115.607	4.0524	0	UDConS2
Bot (-2 Axis) End-J	152.1426	8.1047	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.965	8	4.389	115.607	1.543	152.1426
UDConS1		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.162	0.7288

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.1039	77.0713	3.1039	77.0713
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B290	407	RB-10	147.6872	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	26	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3
Bot (-2 Axis)	0.6267	0.3	0.6267	0.3	0.6267	0.3

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-16.9771	0	UDConS2
Top (+2 Axis) Middle	92.3045	-4.2443	0	UDConS2
Top (+2 Axis) End-J	128.2263	-4.2443	0	UDConS2
Bot (-2 Axis) End-I	2	8.4885	0	UDConS2
Bot (-2 Axis) Middle	92.3045	13.8224	0	UDConS2
Bot (-2 Axis) End-J	110.7654	16.3689	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
5.328	36.9218	4.928	55.3827	5.075	145.6872
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1824	0.8206

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
9.8092	73.8436	9.8092	73.8436
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B291	408	TB-1	65.875	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-2.6382	0	UDConS4
Top (+2 Axis) Middle	32.9375	-0.6596	0	UDConS4
Top (+2 Axis) End-J	61.875	-2.1125	0	UDConS3
Bot (-2 Axis) End-I	0	1.3191	0	UDConS4
Bot (-2 Axis) Middle	32.9375	2.9289	0	UDConS2
Bot (-2 Axis) End-J	61.875	1.0563	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
2.061	0	1.896	16.4688	1.982	61.875
UDConS4		UDConS4		UDConS3	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.925	61.875	1.925	61.875
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B292	411	RB-6	289.8716	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	64	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	1.64	0.32	1.64	0.32	1.64	0.32
Bot (-2 Axis)	1.64	0.32	1.64	0.32	1.64	0.32

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-53.8092	0	UDConS4
Top (+2 Axis) Middle	214.0312	-13.4523	0	UDConS4
Top (+2 Axis) End-J	281.8716	-37.3104	0	UDConS3
Bot (-2 Axis) End-I	71.3437	68.694	0	UDConS2
Bot (-2 Axis) Middle	142.6875	124.7137	0	UDConS2
Bot (-2 Axis) End-J	237.8125	49.3578	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
28.241	12	16.044	95.125	23.015	281.8716
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1723	1.8671

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
5.4686	47.5625	5.4686	47.5625
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B46	412	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-0.0037	0	UDConS6
Top (+2 Axis) Middle	35.9708	-0.5818	0	UDConS3
Top (+2 Axis) End-J	71.9416	-2.3273	0	UDConS3
Bot (-2 Axis) End-I	0	0.1967	0	UDConS3
Bot (-2 Axis) Middle	35.9708	1.7559	0	UDConS2
Bot (-2 Axis) End-J	71.9416	1.1636	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.722	0	1.058	35.9708	1.417	71.9416
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.6397	71.9416	0.6397	71.9416
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B293	413	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0	0	0.2533	0.26	0.2533	0.26
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	0	0	UDConS6
Top (+2 Axis) Middle	35.9708	-0.3059	0	UDConS2
Top (+2 Axis) End-J	51.9562	-0.3059	0	UDConS2
Bot (-2 Axis) End-I	0	0.6082	0	UDConS2
Bot (-2 Axis) Middle	35.9708	3.5583	0	UDConS2
Bot (-2 Axis) End-J	51.9562	2.4975	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
0.968	0	0.788	17.9854	1.036	67.9416
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
0.7324	67.9416	0.7324	67.9416
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B13	418	RB-3	202.7789	0.968	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-46.3554	0	UDConS2
Top (+2 Axis) Middle	141.9452	-13.0729	0	UDConS2
Top (+2 Axis) End-J	194.7789	-52.2915	0	UDConS2
Bot (-2 Axis) End-I	12	23.1777	0	UDConS2
Bot (-2 Axis) Middle	121.6673	58.0036	0	UDConS2
Bot (-2 Axis) End-J	194.7789	26.1458	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0.0366	0	0.07

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
21.852	12	12.034	60.8337	25.297	194.7789
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
3.5042	40.5558	3.5042	40.5558
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B311	423	RB-11	34.4966	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31			0.7333	0.31
Bot (-2 Axis)	0.7333	0.31			0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	12	-12.8113	0	UDConS2
Top (+2 Axis) Middle				
Top (+2 Axis) End-J	34.4966	-5.3539	0	UDConS2
Bot (-2 Axis) End-I	12	6.4057	0	UDConS2
Bot (-2 Axis) Middle				
Bot (-2 Axis) End-J	34.4966	2.677	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0		0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.259	12			3.697	34.4966
UDConS2				UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.41	34.4966	1.41	34.4966
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B312	424	RB-11	107.2971	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	30	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31
Bot (-2 Axis)	0.7333	0.31	0.7333	0.31	0.7333	0.31

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-4.5758	0	UDConS2
Top (+2 Axis) Middle	71.5314	-1.3387	0	UDConS2
Top (+2 Axis) End-J	85.4143	-1.3387	0	UDConS2
Bot (-2 Axis) End-I	0	2.2879	0	UDConS2
Bot (-2 Axis) Middle	71.5314	7.724	0	UDConS2
Bot (-2 Axis) End-J	85.4143	6.729	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
3.56	0	2.666	35.7657	2.025	99.2971
UDConS2		UDConS2		UDConS1	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1638	0.8464

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.4611	35.7657	1.4611	35.7657
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B69	425	RB-12	102	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-8.7644	0	UDConS2
Top (+2 Axis) Middle	34	-4.979	0	UDConS2
Top (+2 Axis) End-J	100	-10.7705	0	UDConS2
Bot (-2 Axis) End-I	4	4.3822	0	UDConS2
Bot (-2 Axis) Middle	68	2.6926	0	UDConS2
Bot (-2 Axis) End-J	100	5.3853	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
1.778	4	2.285	68	2.712	100
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.8515	34	1.8515	34
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B280	426	RB-13	122.8369	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	2	-14.744	0	UDConS2
Top (+2 Axis) Middle	81.8913	-3.686	0	UDConS2
Top (+2 Axis) End-J	120.8369	-8.3222	0	UDConS2
Bot (-2 Axis) End-I	2	7.372	0	UDConS2
Bot (-2 Axis) Middle	81.8913	3.686	0	UDConS2
Bot (-2 Axis) End-J	120.8369	4.1611	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
4.439	2	3.92	40.9456	3.295	120.8369
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.1232	40.9456	1.1232	40.9456
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B282	427	RB-12	102	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	16	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.5206	0.41	0.36	0.28	0.36	0.28
Bot (-2 Axis)	0.36	0.28	0.36	0.28	0.36	0.28

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	4	-29.8309	0	UDConS2
Top (+2 Axis) Middle	34	-12.4131	0	UDConS2
Top (+2 Axis) End-J	84	-7.4577	0	UDConS2
Bot (-2 Axis) End-I	4	14.9154	0	UDConS2
Bot (-2 Axis) Middle	68	7.4577	0	UDConS2
Bot (-2 Axis) End-J	84	7.4577	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
7.167	4	6.767	34	1.942	100
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1564	0.4432

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
2.2616	34	2.2616	34
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	B285	428	TB-1	71.9416	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	12	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.2533	0.26	0.2533	0.26	0	0
Bot (-2 Axis)	0.2533	0.26	0.2533	0.26	0.2533	0.26

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	0	-8.6758	0	UDConS2
Top (+2 Axis) Middle	17.9854	-3.1367	0	UDConS2
Top (+2 Axis) End-J	59.9416	0	0	UDConS6
Bot (-2 Axis) End-I	0	4.3379	0	UDConS2
Bot (-2 Axis) Middle	35.9708	2.169	0	UDConS2
Bot (-2 Axis) End-J	59.9416	4.2018	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
3.786	0	3.606	17.9854	1.054	59.9416
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1553	0.3364

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.189	35.9708	1.189	35.9708
UDConS2		UDConS2	

ETABS Concrete Frame Design

ACI 318-19 Beam Section Design (Envelope)

Beam Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	B286	429	2B-18	181.6909	1	Sway Special

Section Properties

b (in)	h (in)	b_f (in)	d_s (in)	d_{ct} (in)	d_{cb} (in)
8	20	8	0	2.5	2.5

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.75	0.6	0.85

Flexural Reinforcement for Major Axis Moment, M_{u3}

	End-I Rebar Area in²	End-I Rebar %	Middle Rebar Area in²	Middle Rebar %	End-J Rebar Area in²	End-J Rebar %
Top (+2 Axis)	0.4667	0.29	0.4667	0.29	0.4667	0.29
Bot (-2 Axis)	0.4667	0.29	0.4667	0.29	0.4667	0.29

Flexural Design Moment, M_{u3} and Axial Force, P_u

	Station Loc in	Design M_u kip-ft	Design P_u kip	Combo Name
Top (+2 Axis) End-I	8	-7.8794	0	UDConS2
Top (+2 Axis) Middle	113.5568	-2.1182	0	UDConS2
Top (+2 Axis) End-J	169.6909	-8.4726	0	UDConS2
Bot (-2 Axis) End-I	45.4227	10.6684	0	UDConS2
Bot (-2 Axis) Middle	90.8455	13.1	0	UDConS2
Bot (-2 Axis) End-J	169.6909	4.2363	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

End-I Rebar A_v/s in²/ft	Middle Rebar A_v/s in²/ft	End-J Rebar A_v/s in²/ft
0	0	0

Design Shear Force for Major Shear, V_{u2}

End-I Design V_u kip	End-I Station Loc in	Middle Design V_u kip	Middle Station Loc in	End-J Design V_u kip	End-J Station Loc in
6.067	8	2.657	113.5568	3.64	169.6909
UDConS2		UDConS2		UDConS2	

Torsion Reinforcement

Shear Rebar A_t /s in²/ft	Longitudinal Rebar A_l in²
0.1587	0.5554

Design Torsion Force

Design T_u kip-ft	Station Loc in	Design T_u kip-ft	Station Loc in
1.8413	45.4227	1.8413	45.4227
UDConS2		UDConS2	

PALACIOS
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Concrete Column Design

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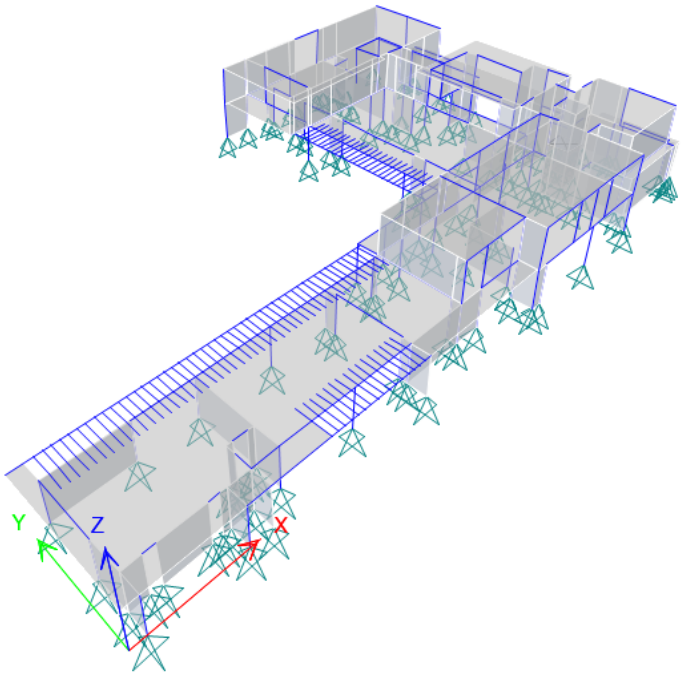

CONCRETE COLUMN DESIGN

Model File: 10840 SW 67 ave model, Revision 0
4/3/2025

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1.1 Concrete Frame Design 3

1 Design Data

This chapter provides design data and results.

1.1 Concrete Frame Design

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C1	275	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	16.002	-11.4753	1.4602	108	UDConS2
Bottom	14.121	-4.8604	-1.2865	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.438	108	UDConS6
Bottom	0.08	0.158	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.687	108	UDConS6
Bottom	0.16	0.649	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C2	276	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	10.492	-0.7535	-20.6719	112	UDConS2
Bottom	11.221	-0.8077	-10.823	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.367	92	UDConS6
Bottom	0.08	1.636	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.072	92	UDConS6
Bottom	0.24	0.137	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C3	277	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	21.835	-6.2112	3.6674	112	UDConS2
Bottom	19.423	-1.3831	-1.7767	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	2.622	112	UDConS6
Bottom	0.08	0.426	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.682	112	UDConS6
Bottom	0.16	0.339	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C4	278	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	-0.749	0.7462	-0.5303	138	UDConS3
Bottom	-3.019	0.2113	0.6247	46	UDConS5

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.306	92	UDConS6
Bottom	0.08	0.485	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.053	138	UDConS6
Bottom	0.16	0.044	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C5	279	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	-0.194	-0.5231	-0.373	128	UDConS3
Bottom	-2.92	-0.2044	0.4092	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.252	92	UDConS6
Bottom	0.08	0.38	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.051	128	UDConS6
Bottom	0.16	0.046	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C6	280	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	15.611	-1.1288	-22.1263	102	UDConS2
Bottom	19.439	1.4109	-8.9789	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.689	92	UDConS6
Bottom	0.08	1.689	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.19	102	UDConS6
Bottom	0.24	0.246	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C7	281	8x24	138	0.776	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	59.079	-20.3515	8.026	102	UDConS2
Bottom	61.119	4.2784	0	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.593	102	UDConS6
Bottom	0.08	0.593	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	1.275	102	UDConS6
Bottom	0.24	1.275	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C8	282	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	16.044	-1.1642	-9.1494	102	UDConS1
Bottom	21.899	-1.5996	-4.3001	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.723	92	UDConS6
Bottom	0.08	0.778	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.317	102	UDConS6
Bottom	0.24	0.226	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C9	283	8x24	138	0.801	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	55.149	21.2018	6.0664	102	UDConS2
Bottom	57.189	4.0033	0	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.411	102	UDConS6
Bottom	0.08	0.411	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	1.325	102	UDConS6
Bottom	0.24	1.325	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C10	284	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	-0.163	-0.3065	0.2497	102	UDConS3
Bottom	9.099	-0.6554	-1.8712	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.848	92	UDConS6
Bottom	0.08	0.848	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.632	102	UDConS6
Bottom	0.16	0.079	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C11	285	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	41.025	3.3187	3.2361	108	UDConS2
Bottom	23.746	-1.8015	-0.9668	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	4.662	108	UDConS6
Bottom	0.08	0.683	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.721	108	UDConS6
Bottom	0.16	0.034	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C12	286	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	48.17	3.9996	-4.5604	108	UDConS2
Bottom	34.867	2.7591	1.6239	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	3.96	108	UDConS6
Bottom	0.08	0.707	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.436	108	UDConS6
Bottom	0.16	0.057	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C13	287	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	-8.383	0.5868	1.566	102	UDConS2
Bottom	9.287	-0.7612	1.0192	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.327	102	UDConS6
Bottom	0.08	0.166	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.314	92	UDConS6
Bottom	0.16	0.314	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C14	288	8x16	138	0.888	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	23.902	1.8232	-1.0584	108	UDConS3
Bottom	35.679	2.8394	0.8006	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.71	108	UDConS6
Bottom	0.08	0.617	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.176	108	UDConS6
Bottom	0.16	0.039	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C15	289	8x16	138	0.941	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	57.546	4.9794	2.1782	108	UDConS4
Bottom	48.242	-4.0281	1.0666	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.185	92	UDConS6
Bottom	0.08	0.185	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.439	108	UDConS6
Bottom	0.16	0.186	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C16	290	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	24.141	-1.9445	0.0327	138	UDConS4
Bottom	21.481	1.7015	0.127	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.305	92	UDConS6
Bottom	0.08	0.368	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.185	92	UDConS6
Bottom	0.16	0.197	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C17	291	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	34.614	-2.7777	1.0985	114	UDConS4
Bottom	30.074	2.3728	-0.4496	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.015	114	UDConS6
Bottom	0.08	0.468	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.227	114	UDConS6
Bottom	0.16	0.018	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C18	292	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	36.384	-2.8934	-2.2516	108	UDConS2
Bottom	28.147	-2.173	0.8376	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	2.295	108	UDConS6
Bottom	0.08	0.243	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.206	108	UDConS6
Bottom	0.16	0.088	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C19	293	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	24.489	-1.8664	5.2293	108	UDConS2
Bottom	25.948	-1.9843	1.6347	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.508	108	UDConS6
Bottom	0.08	0.328	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.137	108	UDConS6
Bottom	0.16	0.095	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C20	294	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	13.117	0.9892	2.6122	138	UDConS4
Bottom	17.852	1.383	0.1165	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.73	138	UDConS6
Bottom	0.08	0.371	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.124	138	UDConS6
Bottom	0.16	0.13	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C21	295	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	23.06	-1.7056	0.2555	90	UDConS3
Bottom	22.286	-1.6432	0.0704	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.22	46	UDConS6
Bottom	0.08	0.22	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.094	90	UDConS6
Bottom	0.16	0.022	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C22	296	8x22	138	0.607	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	22	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.76	1
Bottom	1.76	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	113.321	-17.5083	-11.8987	90	UDConS2
Bottom	114.971	8.048	0	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.066	90	UDConS6
Bottom	0.08	0.066	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.22	1.141	90	UDConS6
Bottom	0.22	1.141	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C23	297	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	19.925	-1.4546	5.8974	90	UDConS4
Bottom	24.553	1.81	-0.0429	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.584	46	UDConS6
Bottom	0.08	0.584	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.155	46	UDConS6
Bottom	0.16	0.155	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C24	298	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	12.45	-4.1786	-1.5928	138	UDConS2
Bottom	14.618	-1.1027	-0.3466	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.484	138	UDConS6
Bottom	0.08	0.323	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.347	138	UDConS6
Bottom	0.16	0.138	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C25	299	8x16	138	0.862	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	43.045	12.394	-14.4921	138	UDConS2
Bottom	38.343	3.3649	0.8151	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	2.648	138	UDConS6
Bottom	0.08	0.25	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.793	138	UDConS6
Bottom	0.16	0.283	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C26	300	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	14.32	1.0559	-0.7081	111	UDConS2
Bottom	12.975	0.9507	0.0031	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.742	111	UDConS6
Bottom	0.08	0.21	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.09	111	UDConS6
Bottom	0.16	0.067	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C27	301	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	7.544	1.8311	0.8315	108	UDConS1
Bottom	10.296	0.6957	1.1354	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.583	108	UDConS6
Bottom	0.08	0.456	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.144	92	UDConS6
Bottom	0.24	0.144	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C28	302	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	8.722	2.188	-0.9595	108	UDConS2
Bottom	11.303	0.7912	0	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.086	108	UDConS6
Bottom	0.08	0.086	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.148	108	UDConS6
Bottom	0.24	0.148	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C29	303	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	4.677	1.748	-0.5144	108	UDConS3
Bottom	7.499	0.525	0	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.064	108	UDConS6
Bottom	0.08	0.064	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.124	108	UDConS6
Bottom	0.24	0.124	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C30	304	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	5.734	1.0799	1.3552	108	UDConS3
Bottom	8.763	-0.6134	0	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.085	108	UDConS6
Bottom	0.08	0.085	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.082	108	UDConS6
Bottom	0.24	0.082	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C31	305	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	4.451	0.3116	1.9997	108	UDConS3
Bottom	6.455	0.4519	0	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.151	108	UDConS6
Bottom	0.08	0.151	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.019	108	UDConS6
Bottom	0.16	0.019	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C32	306	8x24	138	0.996	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	29.998	-3.0827	3.3407	138	UDConS2
Bottom	30.103	-2.3734	-3.1013	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.212	138	UDConS6
Bottom	0.08	1.021	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.232	92	UDConS6
Bottom	0.24	0.232	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C33	307	8x24	138	0.911	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	34.138	-6.5965	3.7684	70	UDConS2
Bottom	39.933	-2.8972	-2.2085	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.88	70	UDConS6
Bottom	0.08	0.731	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.65	70	UDConS6
Bottom	0.24	0.545	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C34	308	8x24	138	0.834	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	95.133	8.5762	-40.794	111	UDConS2
Bottom	59.654	4.8565	7.7068	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.1383	31.414	111	UDConS2
Bottom	0.08	2.688	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.371	92	UDConS6
Bottom	0.24	0.376	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C35	309	8x24	138	0.917	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	4.464	6.9846	4.7313	111	UDConS2
Bottom	-1.663	2.5031	-0.7411	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	3.729	111	UDConS6
Bottom	0.08	3.319	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.435	92	UDConS6
Bottom	0.24	0.435	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C36	310	8x24	138	0.79	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	59.697	-3.4204	-6.6073	70	UDConS4
Bottom	61.942	-4.5962	1.0874	0	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.542	70	UDConS6
Bottom	0.08	0.505	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.377	70	UDConS6
Bottom	0.24	0.275	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C37	311	8x16	138	0.906	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	33.961	2.8174	-0.7028	126	UDConS2
Bottom	34.821	-2.9062	-0.5384	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.598	126	UDConS6
Bottom	0.08	0.49	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.312	126	UDConS6
Bottom	0.16	0.118	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C38	312	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	40.204	-11.3256	27.4707	126	UDConS1
Bottom	43.144	-3.0201	0	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.678	126	UDConS6
Bottom	0.08	1.678	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.694	126	UDConS6
Bottom	0.24	0.694	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C39	313	8x24	138	0.756	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	54.027	3.9834	2.0524	70	UDConS2
Bottom	66.546	4.9669	-4.9122	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.829	46	UDConS6
Bottom	0.08	1.829	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.026	46	UDConS6
Bottom	0.24	0.026	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C40	314	8x24	138	0.783	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	84.364	-7.3736	38.2916	111	UDConS2
Bottom	61.595	5.0473	-6.8977	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.1325	29.959	111	UDConS2
Bottom	0.08	1.316	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.208	111	UDConS6
Bottom	0.24	0.068	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C41	315	8x24	138	0.703	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	87.957	5.7532	9.6753	102	UDConS1
Bottom	93.945	-6.5762	0	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.068	102	UDConS6
Bottom	0.08	0.068	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.414	102	UDConS6
Bottom	0.24	0.414	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C42	316	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	35.671	2.977	4.9909	126	UDConS3
Bottom	27.382	-2.1929	-0.7182	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.611	126	UDConS6
Bottom	0.08	0.443	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.081	126	UDConS6
Bottom	0.16	0.036	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C43	317	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	18.476	3.5113	1.6881	108	UDConS2
Bottom	18.189	1.7785	-1.6616	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.337	108	UDConS6
Bottom	0.08	0.158	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.211	92	UDConS6
Bottom	0.16	0.225	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C44	318	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	14.134	4.4493	-1.2868	108	UDConS2
Bottom	16.971	1.744	-1.5489	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.028	108	UDConS6
Bottom	0.08	0.242	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.382	108	UDConS6
Bottom	0.16	0.228	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C45	319	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	8.788	0.6491	0.4104	126	UDConS4
Bottom	7.645	0.5604	-0.0896	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.253	126	UDConS6
Bottom	0.08	0.12	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.233	126	UDConS6
Bottom	0.12	0.113	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C46	320	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	21.824	-4.1488	-2.0009	108	UDConS2
Bottom	20.484	-1.8355	1.8759	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.471	108	UDConS6
Bottom	0.08	0.243	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.371	108	UDConS6
Bottom	0.16	0.221	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C47	321	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	7.245	0.6666	-0.5914	126	UDConS2
Bottom	6.622	0.4827	-0.1123	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.134	92	UDConS6
Bottom	0.08	0.176	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.245	126	UDConS6
Bottom	0.12	0.144	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C48	322	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	10.553	-0.776	1.6217	126	UDConS3
Bottom	13.665	1.0173	2.2216	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.424	126	UDConS6
Bottom	0.08	0.352	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.067	126	UDConS6
Bottom	0.16	0.059	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C49	323	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	49.717	-6.7796	6.9283	138	UDConS2
Bottom	37.298	3.2606	1.9346	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.368	138	UDConS6
Bottom	0.08	0.289	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.984	138	UDConS6
Bottom	0.16	0.195	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C50	324	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	-4.148	-0.2904	12.1938	118	UDConS2
Bottom	13.953	1.0139	4.8093	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.753	92	UDConS6
Bottom	0.08	0.782	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.278	92	UDConS6
Bottom	0.24	0.314	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C51	325	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	5.222	-0.3736	-7.2492	118	UDConS2
Bottom	14.994	1.1148	-2.5533	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.485	118	UDConS6
Bottom	0.08	0.416	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.157	118	UDConS6
Bottom	0.16	0.148	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C52	326	8x24	138	0.934	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	55.918	4.363	-18.0376	100	UDConS2
Bottom	48.69	3.7458	-8.4601	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.207	92	UDConS6
Bottom	0.08	1.236	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.297	100	UDConS6
Bottom	0.24	0.181	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C53	327	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	26.378	-1.9436	5.2461	100	UDConS2
Bottom	22.392	1.6358	2.2329	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.408	92	UDConS6
Bottom	0.08	0.408	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.788	100	UDConS6
Bottom	0.24	0.121	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C54	328	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	18.573	-1.3882	-0.2187	114	UDConS2
Bottom	16.519	-1.2271	-0.1851	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.381	114	UDConS6
Bottom	0.08	0.236	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.187	114	UDConS6
Bottom	0.16	0.127	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C55	329	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	25.473	6.1188	-6.904	114	UDConS2
Bottom	23.606	1.7436	1.3123	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	2.776	114	UDConS6
Bottom	0.08	0.634	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.289	114	UDConS6
Bottom	0.24	0.166	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C56	330	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	26.89	1.9796	-1.1681	93	UDConS1
Bottom	27.967	-2.0515	-0.02	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	2.048	93	UDConS6
Bottom	0.08	0.519	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.657	93	UDConS6
Bottom	0.24	0.135	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C57	331	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	10.779	0.782	0.8649	93	UDConS4
Bottom	11.283	0.8192	0.2375	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.122	92	UDConS6
Bottom	0.08	0.122	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.049	93	UDConS6
Bottom	0.12	0.085	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C58	332	8x60	138	0.9	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	60	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	4.8	1
Bottom	4.8	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	32.855	-2.7871	1.9698	126	UDConS4
Bottom	42.464	-3.8293	3.7877	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.729	126	UDConS6
Bottom	0.08	1.798	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.6	0.149	126	UDConS6
Bottom	0.6	0.125	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C59	333	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	13.196	0.9801	-0.1419	126	UDConS3
Bottom	16.052	-1.2076	-0.1379	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.018	126	UDConS6
Bottom	0.08	0.03	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.032	92	UDConS6
Bottom	0.16	0.032	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C60	334	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	2.778	0.1958	-0.5315	122	UDConS4
Bottom	5.472	0.3884	0.2947	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.609	122	UDConS6
Bottom	0.08	0.165	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.022	122	UDConS6
Bottom	0.24	0.01	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C61	335	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	10.135	0.728	-0.1367	122	UDConS4
Bottom	14.603	1.0612	0.4133	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.347	92	UDConS6
Bottom	0.08	0.479	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.068	122	UDConS6
Bottom	0.24	0.038	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C62	336	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	29.333	-2.2509	4.145	126	UDConS2
Bottom	25.189	1.906	0.3966	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.368	126	UDConS6
Bottom	0.08	0.457	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.577	126	UDConS6
Bottom	0.24	0.323	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C63	337	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	6.978	-0.7109	1.977	108	UDConS2
Bottom	9.133	-0.6583	0.6436	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.773	108	UDConS6
Bottom	0.08	0.219	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.129	108	UDConS6
Bottom	0.16	0.061	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C64	338	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	29.678	-2.9256	-2.7383	108	UDConS3
Bottom	23.498	1.7824	0.799	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v /s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.111	108	UDConS6
Bottom	0.08	0.686	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v /s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	1.432	108	UDConS6
Bottom	0.16	0.08	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C65	339	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	8.482	6.1193	-1.331	122	UDConS3
Bottom	11.119	-0.8029	0.3744	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.487	92	UDConS6
Bottom	0.08	0.487	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	1.376	122	UDConS6
Bottom	0.24	0.091	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C66	340	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	22.801	1.7665	-0.6488	122	UDConS4
Bottom	19.531	1.4898	0.8981	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.581	122	UDConS6
Bottom	0.08	0.58	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.136	122	UDConS6
Bottom	0.16	0.041	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C67	341	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	9.689	-0.7087	0.0538	126	UDConS3
Bottom	13.083	-0.9697	0.506	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.217	126	UDConS6
Bottom	0.08	0.252	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.018	126	UDConS6
Bottom	0.16	0.015	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C68	342	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	16.582	-1.2541	0.4577	126	UDConS3
Bottom	19.008	-1.4515	0.5887	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.349	126	UDConS6
Bottom	0.08	0.315	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.036	92	UDConS6
Bottom	0.16	0.036	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C69	343	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	14.714	1.6002	1.3404	108	UDConS2
Bottom	18.36	1.3687	0.4275	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.813	108	UDConS6
Bottom	0.08	0.277	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.408	108	UDConS6
Bottom	0.16	0.043	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C70	344	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	24.657	1.8827	-0.2207	108	UDConS2
Bottom	23.537	1.7896	0.1091	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.429	108	UDConS6
Bottom	0.08	0.236	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.32	108	UDConS6
Bottom	0.16	0.063	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C71	345	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	36.298	3.0019	2.5043	122	UDConS2
Bottom	32.566	-2.6458	1.1101	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.124	92	UDConS6
Bottom	0.08	0.132	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.305	122	UDConS6
Bottom	0.16	0.13	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C72	346	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	19.071	1.4869	5.4774	138	UDConS2
Bottom	22.565	-1.7939	1.5087	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.188	138	UDConS6
Bottom	0.08	0.184	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.102	92	UDConS6
Bottom	0.16	0.189	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C71	352	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	0.99	0.8841	0.4665	138	UDConS2
Bottom	7.628	-1.2064	0.6936	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.031	92	UDConS6
Bottom	0.08	0.886	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.374	92	UDConS6
Bottom	0.16	0.401	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C72	353	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	4.584	0.3392	5.6446	138	UDConS2
Bottom	9.514	-0.7024	-3.1211	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.769	92	UDConS6
Bottom	0.08	0.769	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.1	138	UDConS6
Bottom	0.16	0.14	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C77	355	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	17.436	-1.3509	-1.1568	138	UDConS3
Bottom	18.033	-1.7332	1.6644	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.251	92	UDConS6
Bottom	0.08	0.251	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.575	138	UDConS6
Bottom	0.16	0.328	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C78	356	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	10.865	3.1808	0.9924	138	UDConS2
Bottom	11.698	-0.8748	-0.6454	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.395	138	UDConS6
Bottom	0.08	0.314	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.645	138	UDConS6
Bottom	0.16	0.116	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C77	357	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.3828	1.08
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	13.499	-18.8146	1.2286	108	UDConS2
Bottom	15.052	2.6631	1.3721	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.47	108	UDConS6
Bottom	0.08	0.337	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	2.298	92	UDConS6
Bottom	0.16	2.298	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C78	358	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	11.577	-16.6032	-1.052	108	UDConS2
Bottom	11.408	-0.8296	-0.1168	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.692	92	UDConS6
Bottom	0.08	0.207	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	1.766	92	UDConS6
Bottom	0.16	1.811	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C48	359	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	0.313	-0.1542	6.6489	108	UDConS2
Bottom	4.017	0.2853	-3.5126	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.38	92	UDConS6
Bottom	0.08	1.38	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.236	108	UDConS6
Bottom	0.16	0.098	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C79	362	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	35.807	-3.2445	-3.3209	108	UDConS2
Bottom	5.804	-3.0601	4.014	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	5.037	108	UDConS6
Bottom	0.08	2.249	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.271	108	UDConS6
Bottom	0.16	0.344	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C81	364	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	2.659	-0.1884	2.6504	108	UDConS4
Bottom	14.935	-1.1166	-6.2373	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.189	92	UDConS6
Bottom	0.08	1.208	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.279	108	UDConS6
Bottom	0.12	0.423	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C82	365	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	13.909	3.3146	3.495	122	UDConS2
Bottom	9.306	-1.264	-4.0826	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.363	122	UDConS6
Bottom	0.08	1.665	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	1.437	122	UDConS6
Bottom	0.24	0.992	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C54	366	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	13.592	-0.9654	0.6892	58	UDConS1
Bottom	21.875	1.5678	-2.3411	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.492	46	UDConS6
Bottom	0.08	0.492	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.169	58	UDConS6
Bottom	0.16	0.022	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C83	367	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	22.156	-1.5509	3.4661	58	UDConS2
Bottom	22.662	-3.587	8.0412	0	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.579	58	UDConS6
Bottom	0.08	0.579	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.401	58	UDConS6
Bottom	0.24	0.401	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C84	368	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	2.43	-1.475	-0.7251	108	UDConS2
Bottom	7.04	1.3713	-1.4048	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.533	92	UDConS6
Bottom	0.08	0.533	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.215	92	UDConS6
Bottom	0.16	0.319	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C56	372	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	32.342	3.559	9.1102	108	UDConS2
Bottom	29.582	-2.2106	-1.4109	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	4.99	108	UDConS6
Bottom	0.08	1.897	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.997	108	UDConS6
Bottom	0.24	0.645	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C57	373	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	22.098	1.7119	4.1371	108	UDConS2
Bottom	14.482	-1.0823	-0.9976	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.758	108	UDConS6
Bottom	0.08	0.583	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.437	108	UDConS6
Bottom	0.12	0.078	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C58	374	8x60	138	0.985	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	60	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	4.8	1
Bottom	4.8	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	9.787	0.8393	-3.343	126	UDConS2
Bottom	19.599	1.5352	-6.4814	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.252	92	UDConS6
Bottom	0.08	1.252	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.6	0.048	126	UDConS6
Bottom	0.6	0.269	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C59	375	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	2.274	0.1609	1.1125	126	UDConS4
Bottom	6.886	-0.4972	0.4149	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.161	92	UDConS6
Bottom	0.08	0.192	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.057	92	UDConS6
Bottom	0.16	0.057	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C85	382	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	15.277	7.1779	-1.3927	108	UDConS2
Bottom	4.182	-1.295	1.8497	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.842	108	UDConS6
Bottom	0.08	1.801	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.895	108	UDConS6
Bottom	0.16	1.096	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C86	383	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	2.812	-0.1995	2.1141	108	UDConS4
Bottom	10.713	-0.7865	-3.118	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.751	92	UDConS6
Bottom	0.08	0.751	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.174	108	UDConS6
Bottom	0.12	0.621	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C23	384	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	0.847	-0.1573	10.1609	108	UDConS2
Bottom	3.062	-0.2168	-5.7857	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	2.101	92	UDConS6
Bottom	0.08	2.101	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.308	108	UDConS6
Bottom	0.16	0.284	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C20	386	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	3.071	0.2173	-6.9663	108	UDConS2
Bottom	-0.094	0.6858	-0.8467	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.841	92	UDConS6
Bottom	0.08	0.935	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.256	92	UDConS6
Bottom	0.16	0.515	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C19	387	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	72.118	-6.5466	-1.9131	106	UDConS2
Bottom	33.789	2.6513	-4.4205	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.841	106	UDConS6
Bottom	0.08	0.443	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	3.465	106	UDConS6
Bottom	0.16	0.385	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C16	388	8x16	138	0.943	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	4.971	0.3537	-0.2199	108	UDConS4
Bottom	23.573	1.3345	-2.1637	46	UDConS4

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.679	108	UDConS6
Bottom	0.08	0.28	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.563	108	UDConS6
Bottom	0.16	0.408	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C18	389	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	18.441	-8.1372	-1.6597	108	UDConS2
Bottom	19.881	8.4095	4.8014	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.48	108	UDConS6
Bottom	0.08	0.48	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	1.031	108	UDConS6
Bottom	0.16	1.031	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C87	392	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.4595	1.14
Bottom	3.1799	2.48

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	17.255	19.5402	-2.8162	108	UDConS2
Bottom	18.695	-28.6985	4.1363	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.506	108	UDConS6
Bottom	0.08	0.506	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	2.972	108	UDConS6
Bottom	0.16	2.972	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C88	393	8x16	138	0.978	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	2.0398	1.59
Bottom	5.2363	4.09

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	23.27	23.6262	2.4196	108	UDConS2
Bottom	24.71	-36.9789	-6.8263	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.722	108	UDConS6
Bottom	0.08	0.722	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	3.729	108	UDConS6
Bottom	0.16	3.729	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C67	399	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	2.808	-0.1974	0.2535	126	UDConS4
Bottom	4.234	0.3023	0.0548	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.053	92	UDConS6
Bottom	0.08	0.088	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.038	92	UDConS6
Bottom	0.16	0.045	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C68	400	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	1.927	-0.5102	-0.1738	126	UDConS4
Bottom	6.177	0.4447	0.724	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.22	92	UDConS6
Bottom	0.08	0.243	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.094	92	UDConS6
Bottom	0.16	0.094	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C90	401	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	4.401	-5.6822	-0.3977	112	UDConS2
Bottom	6.21	-0.4442	-0.0299	46	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.178	112	UDConS6
Bottom	0.08	0.391	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.811	92	UDConS6
Bottom	0.16	0.811	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C93	406	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	6.352	-0.4515	-21.0695	112	UDConS2
Bottom	-5.661	1.0482	21.4459	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	4.693	112	UDConS6
Bottom	0.08	4.948	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.762	112	UDConS6
Bottom	0.24	0.486	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C32	409	8x24	138	0.976	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	34.047	3.017	3.7602	74	UDConS2
Bottom	34.136	2.1678	-3.7699	0	UDConS3

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.748	74	UDConS6
Bottom	0.08	0.284	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.213	74	UDConS6
Bottom	0.24	0.037	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C94	410	8x16	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	-2.163	-3.0881	0.1947	74	UDConS2
Bottom	-22.133	-8.7612	6.3132	0	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	1.562	46	UDConS6
Bottom	0.08	1.562	0	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.552	46	UDConS6
Bottom	0.16	0.552	0	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C95	414	8x12	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	12	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	0.96	1
Bottom	0.96	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	1.128	6.9094	-0.7126	122	UDConS2
Bottom	2.069	-0.5989	1.9917	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.656	122	UDConS6
Bottom	0.08	0.643	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.12	0.877	122	UDConS6
Bottom	0.12	0.525	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
ROOF	C98	417	8x24	138	1	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	24	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.92	1
Bottom	1.92	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	49.383	-3.8839	17.0644	108	UDConS2
Bottom	37.096	2.858	0.5174	46	UDConS1

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	4.346	108	UDConS6
Bottom	0.08	4.492	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.24	0.466	108	UDConS6
Bottom	0.24	0.298	46	UDConS6

ETABS Concrete Frame Design

ACI 318-19 Column Section Design (Envelope)

Column Element Details (Envelope)

Level	Element	Unique Name	Section ID	Length (in)	LLRF	Type
SECOND FLOOR	C102	430	8x16	138	0.899	Sway Special

Section Properties

b (in)	h (in)	dc (in)	Cover (Torsion) (in)
8	16	2.1884	1

Material Properties

E_c (lb/in²)	f'_c (lb/in²)	Lt.Wt Factor (Unitless)	f_y (lb/in²)	f_{ys} (lb/in²)
3122018.5	3000	1	60000	60000

Design Code Parameters

ϕ_T	ϕ_{CTied}	$\phi_{CSpiral}$	ϕ_{Vns}	ϕ_{Vs}	ϕ_{Vjoint}
0.9	0.65	0.75	0.85	0.6	0.85

Longitudinal Reinforcement Design for P_u - M_{u2} - M_{u3} Interaction

Column End	Rebar Area in²	Rebar %
Top	1.28	1
Bottom	1.28	1

Design Axial Force & Biaxial Moment for P_u - M_{u2} - M_{u3} Interaction

Column End	Design P_u kip	Design M_{u2} kip-ft	Design M_{u3} kip-ft	Station Loc in	Controlling Combo
Top	31.059	3.9566	-2.9157	138	UDConS2
Bottom	31.193	2.6179	1.0124	46	UDConS2

Shear Reinforcement for Major Shear, V_{u2}

Column End	Rebar A_v/s in²/ft	Design V_{u2} kip	Station Loc in	Controlling Combo
Top	0.08	0.591	92	UDConS6
Bottom	0.08	0.591	46	UDConS6

Shear Reinforcement for Minor Shear, V_{u3}

Column End	Rebar A_v/s in²/ft	Design V_{u3} kip	Station Loc in	Controlling Combo
Top	0.16	0.296	92	UDConS6
Bottom	0.16	0.296	46	UDConS6

Steel Column Design

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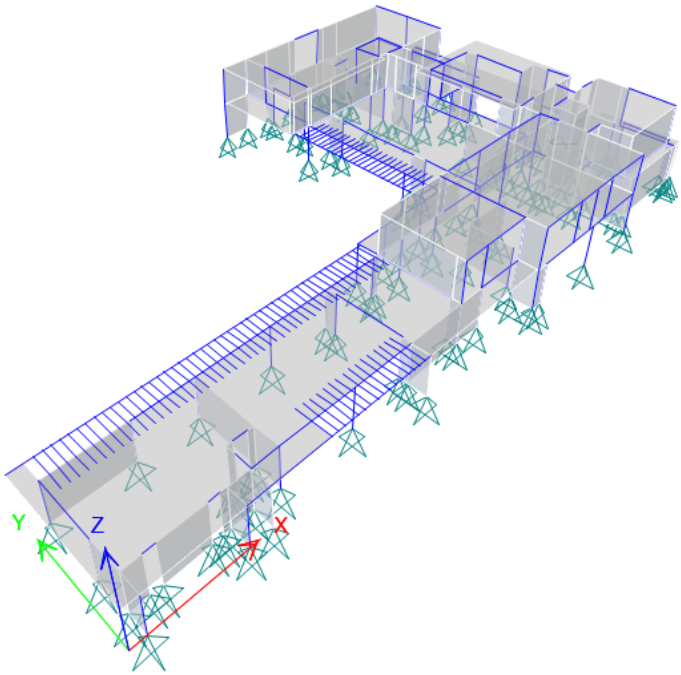

STEEL COLUMN DESIGN

Model File: 10840 SW 67 ave model, Revision 0
4/3/2025

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1.1 Steel Frame Design 3

1 Design Data

This chapter provides design data and results.

1.1 Steel Frame Design

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	70	1.4679	47.686	200	47.686	300
Minor (2-2)	1	70	1.4679	47.686	200	47.686	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C73	348	HSS4X4X3/8-1	DStlS2	70	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.097	0.036	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
70	-21.402	-0.0236	0.0486	0.003	-0.007	0

Axial Force & Biaxial Moment Design Factors (H1-1b)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.507	1	1	1	1	0.6
Minor Bending	0.507	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.507	1	1.629

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/2P_c) + (M_{r33}/M_{c33}) + (M_{r22}/M_{c22})$
0.066 =	0.063 + 0.001 + 0.002

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
21.402	169.823	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.0236	22.0455	22.0455	22.0455
Minor Bending	0.0486	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.003	51.2	6.538E-05
Minor Shear	0.007	51.2	1.383E-04

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C73	348	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	70	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	70	OK
Live Load	138	0	0.3833	0	DStlD2	70	OK
Total Load	138	0	0.575	0	DStlD2	70	OK
Total - Camber	138	0	0.575	0	DStlD2	70	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	122	1.4679	83.11	200	83.11	300
Minor (2-2)	1	122	1.4679	83.11	200	83.11	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C74	349	HSS4X4X3/8-1	DStlS2	122	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.779	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.306	0.34	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
122	-67.365	0.269	0.0118	-0.022	-0.002	0

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.884	1	1	1	1	0.6
Minor Bending	0.884	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.884	1	1.324

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.553 =	0.542 + 0.011 + 4.775E-04

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
67.365	124.347	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.269	22.0455	22.0455	22.0455
Minor Bending	0.0118	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.022	51.2	4.206E-04
Minor Shear	0.002	51.2	3.028E-05

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C74	349	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	122	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	122	OK
Live Load	138	0	0.3833	0	DStlD2	122	OK
Total Load	138	0	0.575	0	DStlD2	122	OK
Total - Camber	138	0	0.575	0	DStlD2	122	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	114	1.4679	77.66	200	77.66	300
Minor (2-2)	1	114	1.4679	77.66	200	77.66	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C75	350	HSS4X4X3/8-1	DStlS2	114	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.143	0.138	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
114	-31.371	0.6906	0.023	-0.066	-0.002	0

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.826	1	1	1	1	0.6
Minor Bending	0.826	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.826	1	1.554

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.267 =	0.238 + 0.028 + 0.001

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
31.371	131.897	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.6906	22.0455	22.0455	22.0455
Minor Bending	0.023	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.066	51.2	0.001
Minor Shear	0.002	51.2	4.753E-05

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C75	350	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	114	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	114	OK
Live Load	138	0	0.3833	0	DStlD2	114	OK
Total Load	138	0	0.575	0	DStlD2	114	OK
Total - Camber	138	0	0.575	0	DStlD2	114	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	122	1.4679	83.11	200	83.11	300
Minor (2-2)	1	122	1.4679	83.11	200	83.11	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C76	351	HSS4X4X3/8-1	DStlS2	122	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.185	0.205	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
122	-40.67	-0.1834	0.1309	0.016	-0.012	0

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.884	1	1	1	1	0.6
Minor Bending	0.884	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.884	1	1.499

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.34 =	0.327 + 0.007 + 0.005

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
40.67	124.347	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.1834	22.0455	22.0455	22.0455
Minor Bending	0.1309	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.016	51.2	3.222E-04
Minor Shear	0.012	51.2	2.364E-04

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C76	351	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	122	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	122	OK
Live Load	138	0	0.3833	0	DStlD2	122	OK
Total Load	138	0	0.575	0	DStlD2	122	OK
Total - Camber	138	0	0.575	0	DStlD2	122	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	108	1.4679	73.573	200	73.573	300
Minor (2-2)	1	108	1.4679	73.573	200	73.573	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C80	363	HSS4X4X3/8-1	DStlS2	0	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.941	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.129	0.112	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
0	-28.338	-0.4231	-3.8798	-0.048	-0.766	0.0008

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.783	1	1	1	1	0.62
Minor Bending	0.783	1	1	1	1	0.264

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.783	1	1.498

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.38 =	0.206 + 0.017 + 0.156

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
28.338	137.497	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.4231	22.0455	22.0455	22.0455
Minor Bending	3.8798	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0008	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.048	51.2	0.001
Minor Shear	0.693	51.2	0.014

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C80	363	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	108	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	108	OK
Live Load	138	0	0.3833	0	DStlD2	108	OK
Total Load	138	0	0.575	0	DStlD2	108	OK
Total - Camber	138	0	0.575	0	DStlD2	108	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	138	1.4679	94.01	200	94.01	300
Minor (2-2)	1	138	1.4679	94.01	200	94.01	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C89	396	HSS4X4X3/8-1	DStlS2	138	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.092	0.131	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
138	-20.229	-0.1792	8.2784	0.036	-1.354	0.0008

Axial Force & Biaxial Moment Design Factors (H1-1b)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	1	1	1	1	1	0.306
Minor Bending	1	1	1	1	1	0.247

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
1	1	2.179

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/2P_c) + (M_{r33}/M_{c33}) + (M_{r22}/M_{c22})$
0.476 =	0.093 + 0.008 + 0.376

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
20.229	109.204	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.1792	22.0455	22.0455	22.0455
Minor Bending	8.2784	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0008	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.038	51.2	0.001
Minor Shear	1.223	51.2	0.024

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C89	396	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	138	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	138	OK
Live Load	138	0	0.3833	0	DStlD2	138	OK
Total Load	138	0	0.575	0	DStlD2	138	OK
Total - Camber	138	0	0.575	0	DStlD2	138	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	112	1.4679	76.298	200	76.298	300
Minor (2-2)	1	112	1.4679	76.298	200	76.298	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C91	404	HSS4X4X3/8-1	DStlS2	112	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.018	0.017	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
112	-3.919	0.221	-0.5134	-0.036	0.102	0.0008

Axial Force & Biaxial Moment Design Factors (H1-1b)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.812	1	1	1	1	0.384
Minor Bending	0.812	1	1	1	1	0.255

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.812	1	2.173

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/2P_c) + (M_{r33}/M_{c33}) + (M_{r22}/M_{c22})$
0.048 =	0.015 + 0.01 + 0.023

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
3.919	133.771	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.221	22.0455	22.0455	22.0455
Minor Bending	0.5134	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0008	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.04	51.2	0.001
Minor Shear	0.095	51.2	0.002

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C91	404	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	112	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	112	OK
Live Load	138	0	0.3833	0	DStlD2	112	OK
Total Load	138	0	0.575	0	DStlD2	112	OK
Total - Camber	138	0	0.575	0	DStlD2	112	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	112	1.4679	76.298	200	76.298	300
Minor (2-2)	1	112	1.4679	76.298	200	76.298	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C92	405	HSS4X4X3/8-1	DStlS2	0	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.084	0.079	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
0	-18.494	-0.0453	4.5572	-0.006	0.907	0.0008

Axial Force & Biaxial Moment Design Factors (H1-1b)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.812	1	1	1	1	0.583
Minor Bending	0.812	1	1	1	1	0.241

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.812	1	1.633

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/2P_c) + (M_{r33}/M_{c33}) + (M_{r22}/M_{c22})$
0.278 =	0.069 + 0.002 + 0.207

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
18.494	133.771	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.0453	22.0455	22.0455	22.0455
Minor Bending	4.5572	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0008	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.009	51.2	1.735E-04
Minor Shear	0.824	51.2	0.016

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C92	405	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	112	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	112	OK
Live Load	138	0	0.3833	0	DStlD2	112	OK
Total Load	138	0	0.575	0	DStlD2	112	OK
Total - Camber	138	0	0.575	0	DStlD2	112	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	122	1.4679	83.11	200	83.11	300
Minor (2-2)	1	122	1.4679	83.11	200	83.11	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C96	415	HSS4X4X3/8-1	DStlS2	0	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.926	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.113	0.126	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
0	-24.931	-3.7833	-2.4419	-0.542	-0.502	0.0008

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.884	1	1	1	1	0.418
Minor Bending	0.884	1	1	1	1	0.247

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.884	1	2.094

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.451 =	0.2 + 0.153 + 0.098

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
24.931	124.347	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	3.7833	22.0455	22.0455	22.0455
Minor Bending	2.4419	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0008	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.542	51.2	0.011
Minor Shear	0.502	51.2	0.01

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C96	415	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	122	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	122	OK
Live Load	138	0	0.3833	0	DStlD2	122	OK
Total Load	138	0	0.575	0	DStlD2	122	OK
Total - Camber	138	0	0.575	0	DStlD2	122	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	122	1.4679	83.11	200	83.11	300
Minor (2-2)	1	122	1.4679	83.11	200	83.11	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C97	416	HSS4X4X3/8-1	DStlS2	0	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.79	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.177	0.197	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
0	-39.001	3.9745	-2.6021	0.569	-0.516	0.0008

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.884	1	1	1	1	0.418
Minor Bending	0.884	1	1	1	1	0.23

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.884	1	2.047

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.579 =	0.314 + 0.16 + 0.105

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
39.001	124.347	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	3.9745	22.0455	22.0455	22.0455
Minor Bending	2.6021	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0008	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.569	51.2	0.011
Minor Shear	0.516	51.2	0.01

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C97	416	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	122	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	122	OK
Live Load	138	0	0.3833	0	DStlD2	122	OK
Total Load	138	0	0.575	0	DStlD2	122	OK
Total - Camber	138	0	0.575	0	DStlD2	122	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	114	1.4679	77.66	200	77.66	300
Minor (2-2)	1	114	1.4679	77.66	200	77.66	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C99	419	HSS4X4X3/8-1	DStlS2	114	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.136	0.132	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
114	-29.905	0.0414	-0.4877	-0.004	0.045	0

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.826	1	1	1	1	0.6
Minor Bending	0.826	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.826	1	1.526

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.248 =	0.227 + 0.002 + 0.02

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
29.905	131.897	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.0414	22.0455	22.0455	22.0455
Minor Bending	0.4877	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.004	51.2	8.295E-05
Minor Shear	0.041	51.2	0.001

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C99	419	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	114	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	114	OK
Live Load	138	0	0.3833	0	DStlD2	114	OK
Total Load	138	0	0.575	0	DStlD2	114	OK
Total - Camber	138	0	0.575	0	DStlD2	114	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	70	1.4679	47.686	200	47.686	300
Minor (2-2)	1	70	1.4679	47.686	200	47.686	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C100	420	HSS4X4X3/8-1	DStlS3	70	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.904	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.184	0.067	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
70	-40.542	0.0116	-0.0272	-0.002	0.003	0

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.507	1	1	1	1	0.6
Minor Bending	0.507	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.507	1	1.594

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.24 =	0.239 + 4.693E-04 + 0.001

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
40.542	169.823	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.0116	22.0455	22.0455	22.0455
Minor Bending	0.0272	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.002	51.2	4.064E-05
Minor Shear	0.003	51.2	5.676E-05

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C100	420	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	70	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	70	OK
Live Load	138	0	0.3833	0	DStlD2	70	OK
Total Load	138	0	0.575	0	DStlD2	70	OK
Total - Camber	138	0	0.575	0	DStlD2	70	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	70	1.4679	47.686	200	47.686	300
Minor (2-2)	1	70	1.4679	47.686	200	47.686	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C101	421	HSS4X4X3/8-1	DStlS2	70	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.925	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.184	0.067	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
70	-40.354	0.1893	-0.2163	-0.022	0.025	0

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.507	1	1	1	1	0.6
Minor Bending	0.507	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.507	1	1.594

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.254 =	0.238 + 0.008 + 0.009

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
40.354	169.823	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.1893	22.0455	22.0455	22.0455
Minor Bending	0.2163	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.022	51.2	4.368E-04
Minor Shear	0.025	51.2	4.899E-04

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C101	421	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	70	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	70	OK
Live Load	138	0	0.3833	0	DStlD2	70	OK
Total Load	138	0	0.575	0	DStlD2	70	OK
Total - Camber	138	0	0.575	0	DStlD2	70	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	70	1.4679	47.686	200	47.686	300
Minor (2-2)	1	70	1.4679	47.686	200	47.686	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
SECOND FLOOR	C93	422	HSS4X4X3/8-1	DStlS4	70	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	1	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.063	0.023	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
4.78	17.5	10.3	10.3	2.06	2.06

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
5.15	5.15	6.39	6.39	1.4679	1.4679	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
70	-13.928	-0.1922	-0.0242	0.03	0.005	0

Axial Force & Biaxial Moment Design Factors (H1-1b)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	0.507	1	1	1	1	0.6
Minor Bending	0.507	1	1	1	1	0.6

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
0.507	1	1.644

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/2P_c) + (M_{r33}/M_{c33}) + (M_{r22}/M_{c22})$
0.051 =	0.041 + 0.009 + 0.001

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
13.928	169.823	197.892

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	0.1922	22.0455	22.0455	22.0455
Minor Bending	0.0242	22.0455		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0	21.022	18.9198

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.032	51.2	0.001
Minor Shear	0.005	51.2	9.852E-05

Element Details

Level	Element	Unique Name	Element Type	Section
SECOND FLOOR	C93	422	Special Moment Frame	HSS4X4X3/8-1

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	70	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	70	OK
Live Load	138	0	0.3833	0	DStlD2	70	OK
Total Load	138	0	0.575	0	DStlD2	70	OK
Total - Camber	138	0	0.575	0	DStlD2	70	OK

ETABS Steel Frame Design

AISC 360-16 Steel Section Check (Envelope Details)

Slenderness Check

Buckling Mode	K Factor	L Length (in)	r (in)	KL/r	KL/r Limit	L/r	L/r Limit
Major (3-3)	1	138	2.2828	60.453	200	60.453	300
Minor (2-2)	1	138	2.2828	60.453	200	60.453	300

Element Details

Level	Element	Unique Name	Section	Combo	Location	Frame Type	Classification
ROOF	C102	431	HSS6X6X3/8	DStlS2	138	Special Moment Frame	Compact

LLRF and Demand/Capacity Ratio

L (in)	LLRF	Stress Ratio Limit
138.0000	0.653	0.95

Analysis and Design Parameters

Provision	Analysis	2nd Order	Reduction
LRFD	Direct Analysis	General 2nd Order	Tau-b Fixed

Stiffness Reduction Factors

$\alpha P_r/P_y$	$\alpha P_r/P_e$	τ_b	EA factor	EI factor
0.2	0.117	1	0.8	0.8

Design Code Parameters

ϕ_b	ϕ_b	ϕ_{TY}	ϕ_{TF}	ϕ_V	$\phi_{V\text{-}RI}$	ϕ_{VT}
0.9	0.9	0.9	0.75	0.9	1	1

Section Properties

A (in²)	J (in⁴)	I_{33} (in⁴)	I_{22} (in⁴)	A_{v3} (in²)	A_{v2} (in²)
7.58	64.6	39.5	39.5	3.46	3.46

Design Properties

S_{33} (in³)	S_{22} (in³)	Z_{33} (in³)	Z_{22} (in³)	r_{33} (in)	r_{22} (in)	C_w (in⁶)
13.17	13.17	15.8	15.8	2.2828	2.2828	Not required

Material Properties

E (lb/in²)	f_y (lb/in²)	R_y	C_{pr}	α
29000000	46000	1.1	1.4	NA

Stress Check forces and Moments

Location (in)	P_u (kip)	M_{u33} (kip-ft)	M_{u22} (kip-ft)	V_{u2} (kip)	V_{u3} (kip)	T_u (kip-ft)
138	-69.668	-4.9134	11.894	0.654	-1.813	0.0028

Axial Force & Biaxial Moment Design Factors (H1-1a)

	L Factor	K_1	K_2	B_1	B_2	C_m
Major Bending	1	1	1	1	1	0.39
Minor Bending	1	1	1	1	1	0.299

Parameters for Lateral Torsion Buckling

L_{ltb}	K_{ltb}	C_b
1	1	2.119

Demand/Capacity (D/C) Ratio

D/C Ratio =	$(P_r/P_c) + (8/9)(M_{r33}/M_{c33}) + (8/9)(M_{r22}/M_{c22})$
0.558 =	0.284 + 0.08 + 0.194

Axial Force and Capacities

P_u Force (kip)	ϕP_{nc} Capacity (kip)	ϕP_{nt} Capacity (kip)
69.668	245.418	313.812

Moments and Capacities

	M_u Moment (kip-ft)	ϕM_n Capacity (kip-ft)	ϕM_n No LTB (kip-ft)	ϕM_n Cb=1 (kip-ft)
Major Bending	4.9134	54.51	54.51	54.51
Minor Bending	11.894	54.51		

Torsion Moment and Capacities

T_u Moment (kip-ft)	T_n Capacity (kip-ft)	ϕT_n Capacity (kip-ft)
0.0028	50.8889	45.8

Shear Design

	V_u Force (kip)	ϕV_n Capacity (kip)	Stress Ratio
Major Shear	0.654	85.877	0.008
Minor Shear	1.813	85.877	0.021

Element Details

Level	Element	Unique Name	Element Type	Section
ROOF	C102	431	Special Moment Frame	HSS6X6X3/8

DEFLECTION DESIGN

Deflection Type	L in	Deflection Value in	Deflection Limit in	Deflection Ratio	Load Combo	Station Location in	Check Status
Dead Load	138	0	1.15	0	DStlD2	138	OK
Super DL + Live Load	138	0	1.15	0	DStlD2	138	OK
Live Load	138	0	0.3833	0	DStlD2	138	OK
Total Load	138	0	0.575	0	DStlD2	138	OK
Total - Camber	138	0	0.575	0	DStlD2	138	OK

PALACIOS
ENGINEERING LLC

Masonry Wall Design

17323 SW 47th Ct. Miramar FL 33029 (954)-558-1505 nestor@palaciosengineering.com

PALACIOS ENGINEERING LLC

Project: 10840 SW 67th Ave.

Date:

By:

Subject: Masonry wall design.

Sheet: of

Design of Garage cmu walls

Ht = 12.83'

RDL = 1370 #/ft
RLL = 300 #/ft
DL = 1350 #/ft
LL = 400 #/ft
cmu = 640 #/ft

ΣDL = 3410 #/ft
ΣLL = 700 #/ft
Zone 4 = 68 psf.
Zone 5 = 78 psf.

Provide f'm = 1500 psi

- #5 @ 32" o.c. vert.

17323 SW 47th Ct. Miramar, FL 33029 (954)-558-1505 nestor@palaciosengineering.com

PALACIOS ENGINEERING LLC

Project: 10840 SW 67th Ave.

Date:

By:

Subject: Masonry wall design.

Sheet: of

Design of Ground floor CMU

Ht = 11.5'

RDL = 1370#/ft
RLL = 300#/ft
DL = 1350#/ft
LL = 400#/ft
CMU = 690#/ft

SDL = 3410#/ft
SLL = 700#/ft

Zone 4 = 69psf
Zone 5 = 80psf

Provide f'm = 1500psi

-#5 @ 32" o.c. vert.

17323 SW 47th Ct. Miramar, FL 33029 (954)-558-1505 nestor@palaciosengineering.com

PALACIOS ENGINEERING LLC

Project: 10840 SW 67th Ave.

Date:

By:

Subject: Masonry wall design.

Sheet: of

Design of 2nd floor conn walls

Ht: 11.5'

ROL = 10'(125psf.) + 2(60psf) = 1370#/ft.

RLL = 300#/ft

Zone (4) = 69psf.

Zone (5) = 80psf.

@ Provide f'm = 1500psi

- #5 @ 32" o.c. vert.

17323 SW 47th Ct. Miramar, FL 33029 (954)-558-1505 nestor@palaciosengineering.com

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

Code References

Calculations per TMS 402-16, IBC 2021, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2021, ASCE 7-16

Construction Type : Grouted Hollow Concrete Masonry

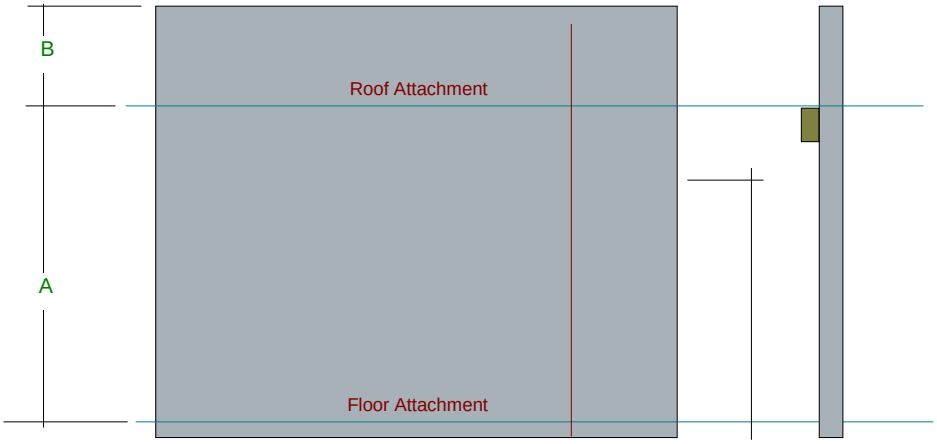
F'm	=	1.50 ksi	Nom. Wall Thickness	8 in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness	7.625 in	Min Allow Out-of-plane Defl Ra	=	0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance	3.8125 in			
Em = f'm *	=	900.0	Lower Level Rebar . . .		Minimum Vertical Steel %	=	0.0020
Max % of ρ bal.	=	0.006013	Bar Size #	5			
Grout Density	=	140 pcf	Bar Spacing	32 in			
Block Weight		Normal Weight					
Wall Weight	=	51.0 psf					

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height = 12.83 ft
B Parapet height = ft

Wall Support Condition Top & Bottom Pinned



Vertical Loads

Vertical Uniform Loads . . . (*Applied per foot of Strip Widt*			DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Ledger Load	Eccentricity	0 in	3.410		.7		k/ft
Concentric Load							k/ft

Lateral Loads

Wind Loads :
Full area WIND load 78 psf

Seismic Loads :
Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight
Seismic Wall Lateral Load 0 psf

Fp 1.0 = 0.0 psf

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

	Governing Load Combination . . .	Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check	Maximum Bending Stress Rat	**0.7442**		
	+0.90D+W	Max Mu	1.882 k-ft	Phi * Mn	2.529 k-ft
PASS	Service Deflection Check	Actual Defl. Ratio L/	566	Allowable Defl. Ratio	150.0
	+D+0.750L+0.450W	Max. Deflection	0.2722 in		
PASS	Axial Load Check	Max Pu / Ag	113.375 psi	Max. Allow. Defl.	1.026 in
	+1.20D+L+W	Location	6.201 ft	0.2 * f'm	300.0 psi
	Reinforcing Limit Check				
		Actual As/bd	0.002541	Max Allow As/bd	0.006017

Maximum Reactions *for Load Combination...*

Top Horizontal	W Only	0.5004 k
Base Horizontal	W Only	0.5004 k
Vertical Reaction	+D+L	4.764 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	0.2*f'm*b*t k	Moment Values Mcr k-ft	Mu k-ft	Phi	Phi Mn k-ft	As in^2	As Ratio	0.6 * rho bal	Bar 'd'
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+0.50W at 5.99 to 6.42	4.511	13.788	0.46	0.92	0.90	2.80	0.116	0.0025	0.0055	0.00
+1.20D+L+W at 5.99 to 6.42	5.211	13.788	0.46	2.04	0.90	2.96	0.116	0.0025	0.0052	0.00
+0.90D+W at 5.99 to 6.42	3.383	13.788	0.46	1.88	0.90	2.53	0.116	0.0025	0.0059	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00

Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	Moment Values Mcr k-ft	Mactual k-ft	Stiffness I gross in^4	I cracked in^4	I effective in^4	Deflections Deflection in	Defl. Ratio
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+D+0.420W at 6.42 to 6.84	3.737	0.46	0.74	342.40	32.99	35.387	0.224	688.4
+D+0.750L+0.450W at 6.42 to 6.84	4.262	0.46	0.82	342.40	34.18	35.895	0.272	565.7
+0.60D+0.420W at 6.42 to 6.84	2.242	0.46	0.71	342.40	29.44	31.964	0.224	686.9
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+0.420W at 6.42 to 6.84	0.000	0.46	0.67	342.40	23.68	26.356	0.228	675.9
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.00 k	4.064 k
+D+L	0.0 k	0.00 k	4.764 k
+D+0.750L	0.0 k	0.00 k	4.589 k
+D+0.60W	0.3 k	0.30 k	4.064 k

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

+D+0.750L+0.450W	0.2 k	0.23 k	4.589 k
+0.60D+0.60W	0.3 k	0.30 k	2.439 k
+D+0.70E	0.0 k	0.00 k	4.064 k
+D+0.750L+0.5250E	0.0 k	0.00 k	4.589 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+0.60D+0.70E	0.0 k	0.00 k	2.439 k
L Only	0.0 k	0.00 k	0.700 k
W Only	0.5 k	0.50 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
Overall MAXimum Envelope								
. . . .+D+0.750L+0.450W at 12.40 to 12.	3.96	0.46	0.00	342.400	33.49	342.400	0.013	999.0
. . . .+D+0.750L+0.450W at 11.97 to 12.	3.98	0.46	0.15	342.400	33.54	342.400	0.038	999.0
. . . .+D+0.750L+0.450W at 11.55 to 11.	4.00	0.46	0.24	342.400	33.59	342.400	0.063	999.0
. . . .+D+0.750L+0.450W at 11.12 to 11.	4.02	0.46	0.33	342.400	33.64	342.400	0.088	999.0
. . . .+D+0.750L+0.450W at 10.69 to 11.	4.04	0.46	0.41	342.400	33.69	342.400	0.112	999.0
. . . .+D+0.750L+0.450W at 10.26 to 10.	4.07	0.46	0.48	342.400	33.74	66.295	0.136	999.0
. . . .+D+0.750L+0.450W at 9.84 to 10.2	4.09	0.46	0.54	342.400	33.79	44.365	0.160	961.4
. . . .+D+0.750L+0.450W at 9.41 to 9.84	4.11	0.46	0.60	342.400	33.84	39.855	0.183	842.8
. . . .+D+0.750L+0.450W at 8.98 to 9.41	4.13	0.46	0.66	342.400	33.89	37.983	0.204	756.5
. . . .+D+0.750L+0.450W at 8.55 to 8.98	4.15	0.46	0.70	342.400	33.94	37.023	0.222	692.9
. . . .+D+0.750L+0.450W at 8.13 to 8.55	4.17	0.46	0.74	342.400	33.99	36.482	0.238	645.9
. . . .+D+0.750L+0.450W at 7.70 to 8.13	4.20	0.46	0.77	342.400	34.04	36.167	0.252	611.8
. . . .+D+0.750L+0.450W at 7.27 to 7.70	4.22	0.46	0.79	342.400	34.09	35.990	0.262	588.0
. . . .+D+0.750L+0.450W at 6.84 to 7.27	4.24	0.46	0.81	342.400	34.14	35.907	0.269	573.0
. . . .+D+0.750L+0.450W at 6.42 to 6.84	4.26	0.46	0.82	342.400	34.18	35.895	0.272	565.7
. . . .+D+0.750L+0.450W at 5.99 to 6.42	4.28	0.46	0.82	342.400	34.23	35.944	0.272	565.7
. . . .+D+0.750L+0.450W at 5.56 to 5.99	4.31	0.46	0.81	342.400	34.28	36.055	0.269	573.1
. . . .+D+0.750L+0.450W at 5.13 to 5.56	4.33	0.46	0.80	342.400	34.33	36.236	0.262	588.2
. . . .+D+0.750L+0.450W at 4.70 to 5.13	4.35	0.46	0.77	342.400	34.38	36.511	0.252	612.1
. . . .+D+0.750L+0.450W at 4.28 to 4.70	4.37	0.46	0.74	342.400	34.43	36.924	0.238	646.3
. . . .+D+0.750L+0.450W at 3.85 to 4.28	4.39	0.46	0.70	342.400	34.48	37.561	0.222	693.3
. . . .+D+0.750L+0.450W at 3.42 to 3.85	4.41	0.46	0.66	342.400	34.53	38.614	0.203	756.9
. . . .+D+0.750L+0.450W at 2.99 to 3.42	4.44	0.46	0.61	342.400	34.58	40.567	0.183	843.2
. . . .+D+0.750L+0.450W at 2.57 to 2.99	4.46	0.46	0.55	342.400	34.63	45.084	0.160	961.8
. . . .+D+0.750L+0.450W at 2.14 to 2.57	4.48	0.46	0.48	342.400	34.67	65.457	0.136	999.0
. . . .+D+0.750L+0.450W at 1.71 to 2.14	4.50	0.46	0.41	342.400	34.72	342.400	0.112	999.0
. . . .+D+0.750L+0.450W at 1.28 to 1.71	4.52	0.46	0.33	342.400	34.77	342.400	0.088	999.0
. . . .+D+0.750L+0.450W at 0.86 to 1.28	4.54	0.46	0.24	342.400	34.82	342.400	0.063	999.0
. . . .+D+0.750L+0.450W at 0.43 to 0.86	4.57	0.46	0.15	342.400	34.87	342.400	0.038	999.0
. . . .+D+0.750L+0.450W at 0.00 to 0.43	4.59	0.46	0.00	342.400	34.92	342.400	0.013	999.0
D Only								
. . . .12.40 to 12.83	3.43	0.46	0.00	342.400	32.28	342.400	0.000	0.0
. . . .11.97 to 12.40	3.45	0.46	0.00	342.400	32.33	342.400	0.000	0.0
. . . .11.55 to 11.97	3.48	0.46	0.00	342.400	32.38	342.400	0.000	0.0
. . . .11.12 to 11.55	3.50	0.46	0.00	342.400	32.43	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .10.69 to 11.12	3.52	0.46	0.00	342.400	32.48	342.400	0.000	0.0
. . . .10.26 to 10.69	3.54	0.46	0.00	342.400	32.53	342.400	0.000	0.0
. . . .9.84 to 10.26	3.56	0.46	0.00	342.400	32.58	342.400	0.000	0.0
. . . .9.41 to 9.84	3.58	0.46	0.00	342.400	32.63	342.400	0.000	0.0
. . . .8.98 to 9.41	3.61	0.46	0.00	342.400	32.68	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .8.55 to 8.98	3.63	0.46	0.00	342.400	32.73	342.400	0.000	0.0
. . . .8.13 to 8.55	3.65	0.46	0.00	342.400	32.78	342.400	0.000	0.0
. . . .7.70 to 8.13	3.67	0.46	0.00	342.400	32.83	342.400	0.000	0.0
. . . .7.27 to 7.70	3.69	0.46	0.00	342.400	32.88	342.400	0.000	0.0
. . . .6.84 to 7.27	3.72	0.46	0.00	342.400	32.93	342.400	0.000	0.0
. . . .6.42 to 6.84	3.74	0.46	0.00	342.400	32.99	342.400	0.000	0.0
. . . .5.99 to 6.42	3.76	0.46	0.00	342.400	33.04	342.400	0.000	0.0
. . . .5.56 to 5.99	3.78	0.46	0.00	342.400	33.09	342.400	0.000	0.0
. . . .5.13 to 5.56	3.80	0.46	0.00	342.400	33.14	342.400	0.000	0.0
. . . .4.70 to 5.13	3.82	0.46	0.00	342.400	33.19	342.400	0.000	0.0
. . . .4.28 to 4.70	3.85	0.46	0.00	342.400	33.24	342.400	0.000	0.0
. . . .3.85 to 4.28	3.87	0.46	0.00	342.400	33.29	342.400	0.000	0.0
. . . .3.42 to 3.85	3.89	0.46	0.00	342.400	33.34	342.400	0.000	0.0
. . . .2.99 to 3.42	3.91	0.46	0.00	342.400	33.39	342.400	0.000	0.0
. . . .2.57 to 2.99	3.93	0.46	0.00	342.400	33.44	342.400	0.000	0.0
. . . .2.14 to 2.57	3.96	0.46	0.00	342.400	33.49	342.400	0.000	0.0
. . . .1.71 to 2.14	3.98	0.46	0.00	342.400	33.54	342.400	0.000	0.0
. . . .1.28 to 1.71	4.00	0.46	0.00	342.400	33.59	342.400	0.000	0.0
. . . .0.86 to 1.28	4.02	0.46	0.00	342.400	33.64	342.400	0.000	0.0
. . . .0.43 to 0.86	4.04	0.46	0.00	342.400	33.69	342.400	0.000	0.0
. . . .0.00 to 0.43	4.06	0.46	0.00	342.400	33.74	342.400	0.000	0.0
+D+L								
. . . .12.40 to 12.83	4.13	0.46	0.00	342.400	33.89	342.400	0.000	0.0
. . . .11.97 to 12.40	4.15	0.46	0.00	342.400	33.94	342.400	0.000	0.0
. . . .11.55 to 11.97	4.18	0.46	0.00	342.400	33.99	342.400	0.000	0.0
. . . .11.12 to 11.55	4.20	0.46	0.00	342.400	34.04	342.400	0.000	0.0
. . . .10.69 to 11.12	4.22	0.46	0.00	342.400	34.09	342.400	0.000	0.0
. . . .10.26 to 10.69	4.24	0.46	0.00	342.400	34.14	342.400	0.000	0.0
. . . .9.84 to 10.26	4.26	0.46	0.00	342.400	34.19	342.400	0.000	0.0
. . . .9.41 to 9.84	4.28	0.46	0.00	342.400	34.24	342.400	0.000	0.0
. . . .8.98 to 9.41	4.31	0.46	0.00	342.400	34.28	342.400	0.000	0.0
. . . .8.55 to 8.98	4.33	0.46	0.00	342.400	34.33	342.400	0.000	0.0
. . . .8.13 to 8.55	4.35	0.46	0.00	342.400	34.38	342.400	0.000	0.0
. . . .7.70 to 8.13	4.37	0.46	0.00	342.400	34.43	342.400	0.000	0.0
. . . .7.27 to 7.70	4.39	0.46	0.00	342.400	34.48	342.400	0.000	0.0
. . . .6.84 to 7.27	4.42	0.46	0.00	342.400	34.53	342.400	0.000	0.0
. . . .6.42 to 6.84	4.44	0.46	0.00	342.400	34.58	342.400	0.000	0.0
. . . .5.99 to 6.42	4.46	0.46	0.00	342.400	34.63	342.400	0.000	0.0
. . . .5.56 to 5.99	4.48	0.46	0.00	342.400	34.68	342.400	0.000	0.0
. . . .5.13 to 5.56	4.50	0.46	0.00	342.400	34.73	342.400	0.000	0.0
. . . .4.70 to 5.13	4.52	0.46	0.00	342.400	34.78	342.400	0.000	0.0
. . . .4.28 to 4.70	4.55	0.46	0.00	342.400	34.82	342.400	0.000	0.0
. . . .3.85 to 4.28	4.57	0.46	0.00	342.400	34.87	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .3.42 to 3.85	4.59	0.46	0.00	342.400	34.92	342.400	0.000	0.0
. . . .2.99 to 3.42	4.61	0.46	0.00	342.400	34.97	342.400	0.000	0.0
. . . .2.57 to 2.99	4.63	0.46	0.00	342.400	35.02	342.400	0.000	0.0
. . . .2.14 to 2.57	4.66	0.46	0.00	342.400	35.07	342.400	0.000	0.0
. . . .1.71 to 2.14	4.68	0.46	0.00	342.400	35.12	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .1.28 to 1.71	4.70	0.46	0.00	342.400	35.17	342.400	0.000	0.0
. . . .0.86 to 1.28	4.72	0.46	0.00	342.400	35.21	342.400	0.000	0.0
. . . .0.43 to 0.86	4.74	0.46	0.00	342.400	35.26	342.400	0.000	0.0
. . . .0.00 to 0.43	4.76	0.46	0.00	342.400	35.31	342.400	0.000	0.0
+D+0.750L								
. . . .12.40 to 12.83	3.96	0.46	0.00	342.400	33.49	342.400	0.000	0.0
. . . .11.97 to 12.40	3.98	0.46	0.00	342.400	33.54	342.400	0.000	0.0
. . . .11.55 to 11.97	4.00	0.46	0.00	342.400	33.59	342.400	0.000	0.0
. . . .11.12 to 11.55	4.02	0.46	0.00	342.400	33.64	342.400	0.000	0.0
. . . .10.69 to 11.12	4.04	0.46	0.00	342.400	33.69	342.400	0.000	0.0
. . . .10.26 to 10.69	4.07	0.46	0.00	342.400	33.74	342.400	0.000	0.0
. . . .9.84 to 10.26	4.09	0.46	0.00	342.400	33.79	342.400	0.000	0.0
. . . .9.41 to 9.84	4.11	0.46	0.00	342.400	33.84	342.400	0.000	0.0
. . . .8.98 to 9.41	4.13	0.46	0.00	342.400	33.89	342.400	0.000	0.0
. . . .8.55 to 8.98	4.15	0.46	0.00	342.400	33.94	342.400	0.000	0.0
. . . .8.13 to 8.55	4.17	0.46	0.00	342.400	33.99	342.400	0.000	0.0
. . . .7.70 to 8.13	4.20	0.46	0.00	342.400	34.04	342.400	0.000	0.0
. . . .7.27 to 7.70	4.22	0.46	0.00	342.400	34.09	342.400	0.000	0.0
. . . .6.84 to 7.27	4.24	0.46	0.00	342.400	34.14	342.400	0.000	0.0
. . . .6.42 to 6.84	4.26	0.46	0.00	342.400	34.18	342.400	0.000	0.0
. . . .5.99 to 6.42	4.28	0.46	0.00	342.400	34.23	342.400	0.000	0.0
. . . .5.56 to 5.99	4.31	0.46	0.00	342.400	34.28	342.400	0.000	0.0
. . . .5.13 to 5.56	4.33	0.46	0.00	342.400	34.33	342.400	0.000	0.0
. . . .4.70 to 5.13	4.35	0.46	0.00	342.400	34.38	342.400	0.000	0.0
. . . .4.28 to 4.70	4.37	0.46	0.00	342.400	34.43	342.400	0.000	0.0
. . . .3.85 to 4.28	4.39	0.46	0.00	342.400	34.48	342.400	0.000	0.0
. . . .3.42 to 3.85	4.41	0.46	0.00	342.400	34.53	342.400	0.000	0.0
. . . .2.99 to 3.42	4.44	0.46	0.00	342.400	34.58	342.400	0.000	0.0
. . . .2.57 to 2.99	4.46	0.46	0.00	342.400	34.63	342.400	0.000	0.0
. . . .2.14 to 2.57	4.48	0.46	0.00	342.400	34.68	342.400	0.000	0.0
. . . .1.71 to 2.14	4.50	0.46	0.00	342.400	34.73	342.400	0.000	0.0
. . . .1.28 to 1.71	4.52	0.46	0.00	342.400	34.77	342.400	0.000	0.0
. . . .0.86 to 1.28	4.55	0.46	0.00	342.400	34.82	342.400	0.000	0.0
. . . .0.43 to 0.86	4.57	0.46	0.00	342.400	34.87	342.400	0.000	0.0
. . . .0.00 to 0.43	4.59	0.46	0.00	342.400	34.92	342.400	0.000	0.0
+D+0.420W								
. . . .12.40 to 12.83	3.43	0.46	0.00	342.400	32.27	342.400	0.010	999.0
. . . .11.97 to 12.40	3.45	0.46	0.14	342.400	32.33	342.400	0.031	999.0
. . . .11.55 to 11.97	3.47	0.46	0.22	342.400	32.38	342.400	0.051	999.0
. . . .11.12 to 11.55	3.50	0.46	0.30	342.400	32.43	342.400	0.071	999.0
. . . .10.69 to 11.12	3.52	0.46	0.37	342.400	32.48	342.400	0.091	999.0
. . . .10.26 to 10.69	3.54	0.46	0.44	342.400	32.53	342.400	0.111	999.0
. . . .9.84 to 10.26	3.56	0.46	0.50	342.400	32.58	53.476	0.130	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .9.41 to 9.84	3.58	0.46	0.55	342.400	32.63	42.348	0.148	999.0
. . . .8.98 to 9.41	3.61	0.46	0.60	342.400	32.68	38.871	0.166	928.9
. . . .8.55 to 8.98	3.63	0.46	0.64	342.400	32.73	37.249	0.181	848.7
. . . .8.13 to 8.55	3.65	0.46	0.67	342.400	32.78	36.370	0.195	789.6
. . . .7.70 to 8.13	3.67	0.46	0.70	342.400	32.83	35.864	0.206	746.6

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .7.27 to 7.70	3.69	0.46	0.72	342.400	32.88	35.575	0.215	716.6
. . . .6.84 to 7.27	3.72	0.46	0.73	342.400	32.93	35.428	0.221	697.6
. . . .6.42 to 6.84	3.74	0.46	0.74	342.400	32.99	35.387	0.224	688.4
. . . .5.99 to 6.42	3.76	0.46	0.74	342.400	33.04	35.437	0.224	688.5
. . . .5.56 to 5.99	3.78	0.46	0.74	342.400	33.09	35.579	0.221	697.8
. . . .5.13 to 5.56	3.80	0.46	0.72	342.400	33.14	35.827	0.215	716.9
. . . .4.70 to 5.13	3.82	0.46	0.70	342.400	33.19	36.217	0.206	746.9
. . . .4.28 to 4.70	3.85	0.46	0.67	342.400	33.24	36.823	0.195	790.0
. . . .3.85 to 4.28	3.87	0.46	0.64	342.400	33.29	37.801	0.181	849.2
. . . .3.42 to 3.85	3.89	0.46	0.60	342.400	33.34	39.514	0.166	929.3
. . . .2.99 to 3.42	3.91	0.46	0.55	342.400	33.39	43.045	0.148	999.0
. . . .2.57 to 2.99	3.93	0.46	0.50	342.400	33.44	53.850	0.130	999.0
. . . .2.14 to 2.57	3.95	0.46	0.44	342.400	33.49	342.400	0.111	999.0
. . . .1.71 to 2.14	3.98	0.46	0.37	342.400	33.53	342.400	0.091	999.0
. . . .1.28 to 1.71	4.00	0.46	0.30	342.400	33.58	342.400	0.071	999.0
. . . .0.86 to 1.28	4.02	0.46	0.22	342.400	33.63	342.400	0.051	999.0
. . . .0.43 to 0.86	4.04	0.46	0.14	342.400	33.68	342.400	0.031	999.0
. . . .0.00 to 0.43	4.06	0.46	0.00	342.400	33.73	342.400	0.010	999.0
+D+0.750L+0.450W								
. . . .12.40 to 12.83	3.96	0.46	0.00	342.400	33.49	342.400	0.013	999.0
. . . .11.97 to 12.40	3.98	0.46	0.15	342.400	33.54	342.400	0.038	999.0
. . . .11.55 to 11.97	4.00	0.46	0.24	342.400	33.59	342.400	0.063	999.0
. . . .11.12 to 11.55	4.02	0.46	0.33	342.400	33.64	342.400	0.088	999.0
. . . .10.69 to 11.12	4.04	0.46	0.41	342.400	33.69	342.400	0.112	999.0
. . . .10.26 to 10.69	4.07	0.46	0.48	342.400	33.74	66.295	0.136	999.0
. . . .9.84 to 10.26	4.09	0.46	0.54	342.400	33.79	44.365	0.160	961.4
. . . .9.41 to 9.84	4.11	0.46	0.60	342.400	33.84	39.855	0.183	842.8
. . . .8.98 to 9.41	4.13	0.46	0.66	342.400	33.89	37.983	0.204	756.5
. . . .8.55 to 8.98	4.15	0.46	0.70	342.400	33.94	37.023	0.222	692.9
. . . .8.13 to 8.55	4.17	0.46	0.74	342.400	33.99	36.482	0.238	645.9
. . . .7.70 to 8.13	4.20	0.46	0.77	342.400	34.04	36.167	0.252	611.8
. . . .7.27 to 7.70	4.22	0.46	0.79	342.400	34.09	35.990	0.262	588.0
. . . .6.84 to 7.27	4.24	0.46	0.81	342.400	34.14	35.907	0.269	573.0
. . . .6.42 to 6.84	4.26	0.46	0.82	342.400	34.18	35.895	0.272	565.7
. . . .5.99 to 6.42	4.28	0.46	0.82	342.400	34.23	35.944	0.272	565.7
. . . .5.56 to 5.99	4.31	0.46	0.81	342.400	34.28	36.055	0.269	573.1
. . . .5.13 to 5.56	4.33	0.46	0.80	342.400	34.33	36.236	0.262	588.2
. . . .4.70 to 5.13	4.35	0.46	0.77	342.400	34.38	36.511	0.252	612.1
. . . .4.28 to 4.70	4.37	0.46	0.74	342.400	34.43	36.924	0.238	646.3
. . . .3.85 to 4.28	4.39	0.46	0.70	342.400	34.48	37.561	0.222	693.3
. . . .3.42 to 3.85	4.41	0.46	0.66	342.400	34.53	38.614	0.203	756.9
. . . .2.99 to 3.42	4.44	0.46	0.61	342.400	34.58	40.567	0.183	843.2
. . . .2.57 to 2.99	4.46	0.46	0.55	342.400	34.63	45.084	0.160	961.8

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .2.14 to 2.57	4.48	0.46	0.48	342.400	34.67	65.457	0.136	999.0
. . . .1.71 to 2.14	4.50	0.46	0.41	342.400	34.72	342.400	0.112	999.0
. . . .1.28 to 1.71	4.52	0.46	0.33	342.400	34.77	342.400	0.088	999.0
. . . .0.86 to 1.28	4.54	0.46	0.24	342.400	34.82	342.400	0.063	999.0
. . . .0.43 to 0.86	4.57	0.46	0.15	342.400	34.87	342.400	0.038	999.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .0.00 to 0.43	4.59	0.46	0.00	342.400	34.92	342.400	0.013	999.0
+0.60D+0.420W								
. . . .12.40 to 12.83	2.06	0.46	0.00	342.400	28.98	342.400	0.010	999.0
. . . .11.97 to 12.40	2.07	0.46	0.13	342.400	29.02	342.400	0.030	999.0
. . . .11.55 to 11.97	2.08	0.46	0.21	342.400	29.05	342.400	0.051	999.0
. . . .11.12 to 11.55	2.10	0.46	0.29	342.400	29.08	342.400	0.071	999.0
. . . .10.69 to 11.12	2.11	0.46	0.36	342.400	29.11	342.400	0.090	999.0
. . . .10.26 to 10.69	2.12	0.46	0.42	342.400	29.15	342.400	0.110	999.0
. . . .9.84 to 10.26	2.14	0.46	0.48	342.400	29.18	56.889	0.129	999.0
. . . .9.41 to 9.84	2.15	0.46	0.53	342.400	29.21	40.140	0.148	999.0
. . . .8.98 to 9.41	2.16	0.46	0.58	342.400	29.24	35.955	0.165	931.1
. . . .8.55 to 8.98	2.18	0.46	0.62	342.400	29.27	34.102	0.181	849.8
. . . .8.13 to 8.55	2.19	0.46	0.65	342.400	29.31	33.113	0.195	789.7
. . . .7.70 to 8.13	2.20	0.46	0.67	342.400	29.34	32.541	0.206	746.0
. . . .7.27 to 7.70	2.22	0.46	0.69	342.400	29.37	32.208	0.215	715.5
. . . .6.84 to 7.27	2.23	0.46	0.71	342.400	29.40	32.029	0.221	696.2
. . . .6.42 to 6.84	2.24	0.46	0.71	342.400	29.44	31.964	0.224	686.9
. . . .5.99 to 6.42	2.26	0.46	0.71	342.400	29.47	31.996	0.224	687.0
. . . .5.56 to 5.99	2.27	0.46	0.71	342.400	29.50	32.126	0.221	696.4
. . . .5.13 to 5.56	2.28	0.46	0.70	342.400	29.53	32.370	0.215	715.7
. . . .4.70 to 5.13	2.29	0.46	0.68	342.400	29.56	32.768	0.206	746.3
. . . .4.28 to 4.70	2.31	0.46	0.65	342.400	29.59	33.404	0.195	790.0
. . . .3.85 to 4.28	2.32	0.46	0.62	342.400	29.63	34.457	0.181	850.1
. . . .3.42 to 3.85	2.33	0.46	0.58	342.400	29.66	36.370	0.165	931.4
. . . .2.99 to 3.42	2.35	0.46	0.53	342.400	29.69	40.581	0.148	999.0
. . . .2.57 to 2.99	2.36	0.46	0.48	342.400	29.72	56.782	0.129	999.0
. . . .2.14 to 2.57	2.37	0.46	0.42	342.400	29.75	342.400	0.110	999.0
. . . .1.71 to 2.14	2.39	0.46	0.36	342.400	29.78	342.400	0.090	999.0
. . . .1.28 to 1.71	2.40	0.46	0.29	342.400	29.82	342.400	0.071	999.0
. . . .0.86 to 1.28	2.41	0.46	0.22	342.400	29.85	342.400	0.051	999.0
. . . .0.43 to 0.86	2.42	0.46	0.13	342.400	29.88	342.400	0.030	999.0
. . . .0.00 to 0.43	2.44	0.46	0.00	342.400	29.91	342.400	0.010	999.0
+D+0.70E								
. . . .12.40 to 12.83	3.43	0.46	0.00	342.400	32.28	342.400	0.000	0.0
. . . .11.97 to 12.40	3.45	0.46	0.00	342.400	32.33	342.400	0.000	0.0
. . . .11.55 to 11.97	3.48	0.46	0.00	342.400	32.38	342.400	0.000	0.0
. . . .11.12 to 11.55	3.50	0.46	0.00	342.400	32.43	342.400	0.000	0.0
. . . .10.69 to 11.12	3.52	0.46	0.00	342.400	32.48	342.400	0.000	0.0
. . . .10.26 to 10.69	3.54	0.46	0.00	342.400	32.53	342.400	0.000	0.0
. . . .9.84 to 10.26	3.56	0.46	0.00	342.400	32.58	342.400	0.000	0.0
. . . .9.41 to 9.84	3.58	0.46	0.00	342.400	32.63	342.400	0.000	0.0
. . . .8.98 to 9.41	3.61	0.46	0.00	342.400	32.68	342.400	0.000	0.0
. . . .8.55 to 8.98	3.63	0.46	0.00	342.400	32.73	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .8.13 to 8.55	3.65	0.46	0.00	342.400	32.78	342.400	0.000	0.0
. . . .7.70 to 8.13	3.67	0.46	0.00	342.400	32.83	342.400	0.000	0.0
. . . .7.27 to 7.70	3.69	0.46	0.00	342.400	32.88	342.400	0.000	0.0
. . . .6.84 to 7.27	3.72	0.46	0.00	342.400	32.93	342.400	0.000	0.0
. . . .6.42 to 6.84	3.74	0.46	0.00	342.400	32.99	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .5.99 to 6.42	3.76	0.46	0.00	342.400	33.04	342.400	0.000	0.0
. . . .5.56 to 5.99	3.78	0.46	0.00	342.400	33.09	342.400	0.000	0.0
. . . .5.13 to 5.56	3.80	0.46	0.00	342.400	33.14	342.400	0.000	0.0
. . . .4.70 to 5.13	3.82	0.46	0.00	342.400	33.19	342.400	0.000	0.0
. . . .4.28 to 4.70	3.85	0.46	0.00	342.400	33.24	342.400	0.000	0.0
. . . .3.85 to 4.28	3.87	0.46	0.00	342.400	33.29	342.400	0.000	0.0
. . . .3.42 to 3.85	3.89	0.46	0.00	342.400	33.34	342.400	0.000	0.0
. . . .2.99 to 3.42	3.91	0.46	0.00	342.400	33.39	342.400	0.000	0.0
. . . .2.57 to 2.99	3.93	0.46	0.00	342.400	33.44	342.400	0.000	0.0
. . . .2.14 to 2.57	3.96	0.46	0.00	342.400	33.49	342.400	0.000	0.0
. . . .1.71 to 2.14	3.98	0.46	0.00	342.400	33.54	342.400	0.000	0.0
. . . .1.28 to 1.71	4.00	0.46	0.00	342.400	33.59	342.400	0.000	0.0
. . . .0.86 to 1.28	4.02	0.46	0.00	342.400	33.64	342.400	0.000	0.0
. . . .0.43 to 0.86	4.04	0.46	0.00	342.400	33.69	342.400	0.000	0.0
. . . .0.00 to 0.43	4.06	0.46	0.00	342.400	33.74	342.400	0.000	0.0
+D+0.750L+0.5250E								
. . . .12.40 to 12.83	3.96	0.46	0.00	342.400	33.49	342.400	0.000	0.0
. . . .11.97 to 12.40	3.98	0.46	0.00	342.400	33.54	342.400	0.000	0.0
. . . .11.55 to 11.97	4.00	0.46	0.00	342.400	33.59	342.400	0.000	0.0
. . . .11.12 to 11.55	4.02	0.46	0.00	342.400	33.64	342.400	0.000	0.0
. . . .10.69 to 11.12	4.04	0.46	0.00	342.400	33.69	342.400	0.000	0.0
. . . .10.26 to 10.69	4.07	0.46	0.00	342.400	33.74	342.400	0.000	0.0
. . . .9.84 to 10.26	4.09	0.46	0.00	342.400	33.79	342.400	0.000	0.0
. . . .9.41 to 9.84	4.11	0.46	0.00	342.400	33.84	342.400	0.000	0.0
. . . .8.98 to 9.41	4.13	0.46	0.00	342.400	33.89	342.400	0.000	0.0
. . . .8.55 to 8.98	4.15	0.46	0.00	342.400	33.94	342.400	0.000	0.0
. . . .8.13 to 8.55	4.17	0.46	0.00	342.400	33.99	342.400	0.000	0.0
. . . .7.70 to 8.13	4.20	0.46	0.00	342.400	34.04	342.400	0.000	0.0
. . . .7.27 to 7.70	4.22	0.46	0.00	342.400	34.09	342.400	0.000	0.0
. . . .6.84 to 7.27	4.24	0.46	0.00	342.400	34.14	342.400	0.000	0.0
. . . .6.42 to 6.84	4.26	0.46	0.00	342.400	34.18	342.400	0.000	0.0
. . . .5.99 to 6.42	4.28	0.46	0.00	342.400	34.23	342.400	0.000	0.0
. . . .5.56 to 5.99	4.31	0.46	0.00	342.400	34.28	342.400	0.000	0.0
. . . .5.13 to 5.56	4.33	0.46	0.00	342.400	34.33	342.400	0.000	0.0
. . . .4.70 to 5.13	4.35	0.46	0.00	342.400	34.38	342.400	0.000	0.0
. . . .4.28 to 4.70	4.37	0.46	0.00	342.400	34.43	342.400	0.000	0.0
. . . .3.85 to 4.28	4.39	0.46	0.00	342.400	34.48	342.400	0.000	0.0
. . . .3.42 to 3.85	4.41	0.46	0.00	342.400	34.53	342.400	0.000	0.0
. . . .2.99 to 3.42	4.44	0.46	0.00	342.400	34.58	342.400	0.000	0.0
. . . .2.57 to 2.99	4.46	0.46	0.00	342.400	34.63	342.400	0.000	0.0
. . . .2.14 to 2.57	4.48	0.46	0.00	342.400	34.68	342.400	0.000	0.0
. . . .1.71 to 2.14	4.50	0.46	0.00	342.400	34.73	342.400	0.000	0.0
. . . .1.28 to 1.71	4.52	0.46	0.00	342.400	34.77	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .0.86 to 1.28	4.55	0.46	0.00	342.400	34.82	342.400	0.000	0.0
. . . .0.43 to 0.86	4.57	0.46	0.00	342.400	34.87	342.400	0.000	0.0
. . . .0.00 to 0.43	4.59	0.46	0.00	342.400	34.92	342.400	0.000	0.0
+0.60D+0.70E								
. . . .12.40 to 12.83	2.06	0.46	0.00	342.400	28.99	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .11.97 to 12.40	2.07	0.46	0.00	342.400	29.02	342.400	0.000	0.0
. . . .11.55 to 11.97	2.09	0.46	0.00	342.400	29.05	342.400	0.000	0.0
. . . .11.12 to 11.55	2.10	0.46	0.00	342.400	29.08	342.400	0.000	0.0
. . . .10.69 to 11.12	2.11	0.46	0.00	342.400	29.11	342.400	0.000	0.0
. . . .10.26 to 10.69	2.12	0.46	0.00	342.400	29.15	342.400	0.000	0.0
. . . .9.84 to 10.26	2.14	0.46	0.00	342.400	29.18	342.400	0.000	0.0
. . . .9.41 to 9.84	2.15	0.46	0.00	342.400	29.21	342.400	0.000	0.0
. . . .8.98 to 9.41	2.16	0.46	0.00	342.400	29.24	342.400	0.000	0.0
. . . .8.55 to 8.98	2.18	0.46	0.00	342.400	29.27	342.400	0.000	0.0
. . . .8.13 to 8.55	2.19	0.46	0.00	342.400	29.31	342.400	0.000	0.0
. . . .7.70 to 8.13	2.20	0.46	0.00	342.400	29.34	342.400	0.000	0.0
. . . .7.27 to 7.70	2.22	0.46	0.00	342.400	29.37	342.400	0.000	0.0
. . . .6.84 to 7.27	2.23	0.46	0.00	342.400	29.40	342.400	0.000	0.0
. . . .6.42 to 6.84	2.24	0.46	0.00	342.400	29.44	342.400	0.000	0.0
. . . .5.99 to 6.42	2.26	0.46	0.00	342.400	29.47	342.400	0.000	0.0
. . . .5.56 to 5.99	2.27	0.46	0.00	342.400	29.50	342.400	0.000	0.0
. . . .5.13 to 5.56	2.28	0.46	0.00	342.400	29.53	342.400	0.000	0.0
. . . .4.70 to 5.13	2.29	0.46	0.00	342.400	29.56	342.400	0.000	0.0
. . . .4.28 to 4.70	2.31	0.46	0.00	342.400	29.59	342.400	0.000	0.0
. . . .3.85 to 4.28	2.32	0.46	0.00	342.400	29.63	342.400	0.000	0.0
. . . .3.42 to 3.85	2.33	0.46	0.00	342.400	29.66	342.400	0.000	0.0
. . . .2.99 to 3.42	2.35	0.46	0.00	342.400	29.69	342.400	0.000	0.0
. . . .2.57 to 2.99	2.36	0.46	0.00	342.400	29.72	342.400	0.000	0.0
. . . .2.14 to 2.57	2.37	0.46	0.00	342.400	29.75	342.400	0.000	0.0
. . . .1.71 to 2.14	2.39	0.46	0.00	342.400	29.79	342.400	0.000	0.0
. . . .1.28 to 1.71	2.40	0.46	0.00	342.400	29.82	342.400	0.000	0.0
. . . .0.86 to 1.28	2.41	0.46	0.00	342.400	29.85	342.400	0.000	0.0
. . . .0.43 to 0.86	2.43	0.46	0.00	342.400	29.88	342.400	0.000	0.0
. . . .0.00 to 0.43	2.44	0.46	0.00	342.400	29.91	342.400	0.000	0.0
L Only								
. . . .12.40 to 12.83	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .11.97 to 12.40	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .11.55 to 11.97	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .11.12 to 11.55	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .10.69 to 11.12	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .10.26 to 10.69	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .9.84 to 10.26	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .9.41 to 9.84	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .8.98 to 9.41	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .8.55 to 8.98	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .8.13 to 8.55	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .7.70 to 8.13	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .7.27 to 7.70	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

. . . .6.84 to 7.27	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .6.42 to 6.84	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .5.99 to 6.42	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .5.56 to 5.99	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .5.13 to 5.56	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .4.70 to 5.13	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .4.28 to 4.70	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .3.85 to 4.28	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .3.42 to 3.85	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .2.99 to 3.42	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .2.57 to 2.99	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .2.14 to 2.57	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .1.71 to 2.14	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .1.28 to 1.71	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .0.86 to 1.28	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .0.43 to 0.86	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .0.00 to 0.43	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
+0.420W								
. . . .12.40 to 12.83	0.00	0.46	0.00	342.400	23.68	342.400	0.010	999.0
. . . .11.97 to 12.40	0.00	0.46	0.13	342.400	23.68	342.400	0.030	999.0
. . . .11.55 to 11.97	0.00	0.46	0.21	342.400	23.68	342.400	0.051	999.0
. . . .11.12 to 11.55	0.00	0.46	0.28	342.400	23.68	342.400	0.071	999.0
. . . .10.69 to 11.12	0.00	0.46	0.34	342.400	23.68	342.400	0.091	999.0
. . . .10.26 to 10.69	0.00	0.46	0.40	342.400	23.68	342.400	0.110	999.0
. . . .9.84 to 10.26	0.00	0.46	0.46	342.400	23.68	183.370	0.130	999.0
. . . .9.41 to 9.84	0.00	0.46	0.50	342.400	23.68	37.221	0.149	999.0
. . . .8.98 to 9.41	0.00	0.46	0.55	342.400	23.68	31.259	0.166	925.1
. . . .8.55 to 8.98	0.00	0.46	0.58	342.400	23.68	28.952	0.183	842.2
. . . .8.13 to 8.55	0.00	0.46	0.61	342.400	23.68	27.772	0.197	780.9
. . . .7.70 to 8.13	0.00	0.46	0.64	342.400	23.68	27.096	0.209	736.3
. . . .7.27 to 7.70	0.00	0.46	0.65	342.400	23.68	26.692	0.218	705.2
. . . .6.84 to 7.27	0.00	0.46	0.67	342.400	23.68	26.462	0.225	685.5
. . . .6.42 to 6.84	0.00	0.46	0.67	342.400	23.68	26.356	0.228	675.9
. . . .5.99 to 6.42	0.00	0.46	0.67	342.400	23.68	26.356	0.228	675.9
. . . .5.56 to 5.99	0.00	0.46	0.67	342.400	23.68	26.462	0.225	685.5
. . . .5.13 to 5.56	0.00	0.46	0.65	342.400	23.68	26.692	0.218	705.2
. . . .4.70 to 5.13	0.00	0.46	0.64	342.400	23.68	27.096	0.209	736.3
. . . .4.28 to 4.70	0.00	0.46	0.61	342.400	23.68	27.772	0.197	780.9
. . . .3.85 to 4.28	0.00	0.46	0.58	342.400	23.68	28.952	0.183	842.2
. . . .3.42 to 3.85	0.00	0.46	0.55	342.400	23.68	31.259	0.166	925.1
. . . .2.99 to 3.42	0.00	0.46	0.50	342.400	23.68	37.221	0.149	999.0
. . . .2.57 to 2.99	0.00	0.46	0.46	342.400	23.68	183.382	0.130	999.0
. . . .2.14 to 2.57	0.00	0.46	0.40	342.400	23.68	342.400	0.110	999.0
. . . .1.71 to 2.14	0.00	0.46	0.34	342.400	23.68	342.400	0.091	999.0
. . . .1.28 to 1.71	0.00	0.46	0.28	342.400	23.68	342.400	0.071	999.0
. . . .0.86 to 1.28	0.00	0.46	0.21	342.400	23.68	342.400	0.051	999.0
. . . .0.43 to 0.86	0.00	0.46	0.13	342.400	23.68	342.400	0.030	999.0
. . . .0.00 to 0.43	0.00	0.46	0.00	342.400	23.68	342.400	0.010	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: GARAGE CMU WALLS

E Only

. . . .12.40 to 12.83	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .11.97 to 12.40	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .11.55 to 11.97	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .11.12 to 11.55	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .10.69 to 11.12	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .10.26 to 10.69	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .9.84 to 10.26	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .9.41 to 9.84	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.98 to 9.41	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.55 to 8.98	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.13 to 8.55	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .7.70 to 8.13	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .7.27 to 7.70	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.84 to 7.27	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.42 to 6.84	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.99 to 6.42	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.56 to 5.99	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.13 to 5.56	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.70 to 5.13	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.28 to 4.70	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.85 to 4.28	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.42 to 3.85	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.99 to 3.42	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.57 to 2.99	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.14 to 2.57	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.71 to 2.14	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.28 to 1.71	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.86 to 1.28	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.43 to 0.86	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.00 to 0.43	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

Code References

Calculations per TMS 402-16, IBC 2021, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2021, ASCE 7-16

Construction Type : Grouted Hollow Concrete Masonry

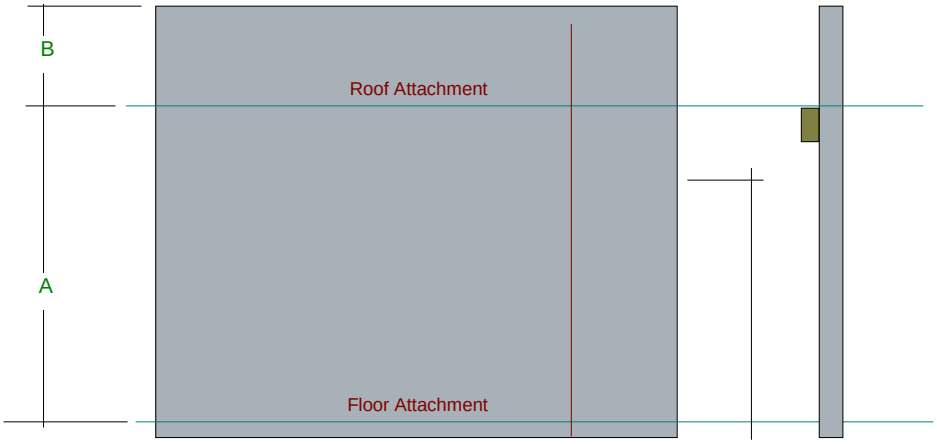
F'm	=	1.50 ksi	Nom. Wall Thickness		8	in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness		7.625	in	Min Allow Out-of-plane Defl Ra	=	0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance		3.8125	in			
Em = f'm *	=	900.0	Lower Level Rebar . . .				Minimum Vertical Steel %	=	0.0020
Max % of ρ bal.	=	0.006014	Bar Size	#	5				
Grout Density	=	140 pcf	Bar Spacing		32	in			
Block Weight		Normal Weight							
Wall Weight	=	51.0 psf							

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height = 11.5 ft
B Parapet height = ft

Wall Support Condition Top & Bottom Pinned



Vertical Loads

Vertical Uniform Loads . . . (*Applied per foot of Strip Widt*			DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind	
Ledger Load	Eccentricity	in	3.410		0.70			k/ft
Concentric Load								k/ft

Lateral Loads

Wind Loads :
Full area WIND load 80 psf

Seismic Loads :
Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight
Seismic Wall Lateral Load psf

Fp 1.0 = 0.0 psf

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

	Governing Load Combination . . .	Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check +0.90D+W	Maximum Bending Stress Rat	**0.5884**		
		Max Mu	1.484 k-ft	Phi * Mn	2.522 k-ft
PASS	Service Deflection Check +D+0.750L+0.450W	Actual Defl. Ratio L/	1,259	Allowable Defl. Ratio	150.0
		Max. Deflection	0.1096 in		
PASS	Axial Load Check +1.20D+L+W	Max Pu / Ag	112.431 psi	Max. Allow. Defl.	0.920 in
		Location	5.558 ft	0.2 * f'm	300.0 psi
	Reinforcing Limit Check				
		Actual As/bd	0.002541	Max Allow As/bd	0.006016

Maximum Reactions *for Load Combination...*

Top Horizontal	W Only	0.460 k
Base Horizontal	W Only	0.460 k
Vertical Reaction	+D+L	4.697 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	0.2*f'm*b*t k	Moment Values Mcr k-ft	Mu k-ft	Phi	Phi Mn k-ft	As in^2	As Ratio	0.6 * rho bal	Bar 'd'
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+0.50W at 5.37 to 5.75	4.467	13.788	0.46	0.71	0.90	2.79	0.116	0.0025	0.0055	0.00
+1.20D+L+W at 5.37 to 5.75	5.167	13.788	0.46	1.57	0.90	2.95	0.116	0.0025	0.0053	0.00
+0.90D+W at 5.37 to 5.75	3.350	13.788	0.46	1.48	0.90	2.53	0.116	0.0025	0.0059	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00

Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	Moment Values Mcr k-ft	Mactual k-ft	Stiffness I gross in^4	I cracked in^4	I effective in^4	Deflections Deflection in	Defl. Ratio
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+D+0.420W at 5.75 to 6.13	3.703	0.46	0.58	342.40	32.91	40.198	0.081	1,698.9
+D+0.750L+0.450W at 5.75 to 6.13	4.228	0.46	0.63	342.40	34.11	38.989	0.110	1,258.8
+0.60D+0.420W at 5.75 to 6.13	2.222	0.46	0.57	342.40	29.39	36.636	0.082	1,689.1
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+0.420W at 5.75 to 6.13	0.000	0.46	0.55	342.40	23.68	30.660	0.084	1,642.9
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.00 k	3.996 k
+D+L	0.0 k	0.00 k	4.696 k
+D+0.750L	0.0 k	0.00 k	4.521 k
+D+0.60W	0.3 k	0.28 k	3.997 k

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

+D+0.750L+0.450W	0.2 k	0.21 k	4.522 k
+0.60D+0.60W	0.3 k	0.28 k	2.398 k
+D+0.70E	0.0 k	0.00 k	3.996 k
+D+0.750L+0.5250E	0.0 k	0.00 k	4.521 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+0.60D+0.70E	0.0 k	0.00 k	2.398 k
L Only	0.0 k	0.00 k	0.700 k
W Only	0.5 k	0.46 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
Overall MAXimum Envelope								
. . . .+D+0.750L+0.450W at 11.12 to 11.	3.95	0.46	0.00	342.400	33.48	342.400	0.005	999.0
. . . .+D+0.750L+0.450W at 10.73 to 11.	3.97	0.46	0.12	342.400	33.53	342.400	0.015	999.0
. . . .+D+0.750L+0.450W at 10.35 to 10.	3.99	0.46	0.19	342.400	33.57	342.400	0.025	999.0
. . . .+D+0.750L+0.450W at 9.97 to 10.3	4.01	0.46	0.26	342.400	33.62	342.400	0.034	999.0
. . . .+D+0.750L+0.450W at 9.58 to 9.97	4.03	0.46	0.32	342.400	33.66	342.400	0.044	999.0
. . . .+D+0.750L+0.450W at 9.20 to 9.58	4.05	0.46	0.37	342.400	33.71	342.400	0.053	999.0
. . . .+D+0.750L+0.450W at 8.82 to 9.20	4.07	0.46	0.42	342.400	33.75	342.400	0.062	999.0
. . . .+D+0.750L+0.450W at 8.43 to 8.82	4.09	0.46	0.47	342.400	33.80	77.804	0.071	999.0
. . . .+D+0.750L+0.450W at 8.05 to 8.43	4.11	0.46	0.51	342.400	33.84	50.618	0.080	999.0
. . . .+D+0.750L+0.450W at 7.67 to 8.05	4.13	0.46	0.54	342.400	33.89	44.490	0.088	999.0
. . . .+D+0.750L+0.450W at 7.28 to 7.67	4.15	0.46	0.57	342.400	33.93	41.802	0.095	999.0
. . . .+D+0.750L+0.450W at 6.90 to 7.28	4.17	0.46	0.60	342.400	33.97	40.381	0.101	999.0
. . . .+D+0.750L+0.450W at 6.52 to 6.90	4.19	0.46	0.61	342.400	34.02	39.584	0.105	999.0
. . . .+D+0.750L+0.450W at 6.13 to 6.52	4.21	0.46	0.63	342.400	34.06	39.157	0.108	999.0
. . . .+D+0.750L+0.450W at 5.75 to 6.13	4.23	0.46	0.63	342.400	34.11	38.989	0.110	999.0
. . . .+D+0.750L+0.450W at 5.37 to 5.75	4.25	0.46	0.63	342.400	34.15	39.035	0.110	999.0
. . . .+D+0.750L+0.450W at 4.98 to 5.37	4.27	0.46	0.63	342.400	34.20	39.295	0.108	999.0
. . . .+D+0.750L+0.450W at 4.60 to 4.98	4.29	0.46	0.62	342.400	34.24	39.815	0.105	999.0
. . . .+D+0.750L+0.450W at 4.22 to 4.60	4.31	0.46	0.60	342.400	34.28	40.705	0.100	999.0
. . . .+D+0.750L+0.450W at 3.83 to 4.22	4.33	0.46	0.57	342.400	34.33	42.220	0.095	999.0
. . . .+D+0.750L+0.450W at 3.45 to 3.83	4.35	0.46	0.55	342.400	34.37	44.997	0.088	999.0
. . . .+D+0.750L+0.450W at 3.07 to 3.45	4.36	0.46	0.51	342.400	34.42	51.170	0.080	999.0
. . . .+D+0.750L+0.450W at 2.68 to 3.07	4.38	0.46	0.47	342.400	34.46	77.290	0.071	999.0
. . . .+D+0.750L+0.450W at 2.30 to 2.68	4.40	0.46	0.43	342.400	34.50	342.400	0.062	999.0
. . . .+D+0.750L+0.450W at 1.92 to 2.30	4.42	0.46	0.37	342.400	34.55	342.400	0.053	999.0
. . . .+D+0.750L+0.450W at 1.53 to 1.92	4.44	0.46	0.32	342.400	34.59	342.400	0.044	999.0
. . . .+D+0.750L+0.450W at 1.15 to 1.53	4.46	0.46	0.26	342.400	34.64	342.400	0.034	999.0
. . . .+D+0.750L+0.450W at 0.77 to 1.15	4.48	0.46	0.19	342.400	34.68	342.400	0.025	999.0
. . . .+D+0.750L+0.450W at 0.38 to 0.77	4.50	0.46	0.12	342.400	34.72	342.400	0.015	999.0
. . . .+D+0.750L+0.450W at 0.00 to 0.38	4.52	0.46	0.00	342.400	34.77	342.400	0.005	999.0
D Only								
. . . .11.12 to 11.50	3.43	0.46	0.00	342.400	32.27	342.400	0.000	0.0
. . . .10.73 to 11.12	3.45	0.46	0.00	342.400	32.32	342.400	0.000	0.0
. . . .10.35 to 10.73	3.47	0.46	0.00	342.400	32.36	342.400	0.000	0.0
. . . .9.97 to 10.35	3.49	0.46	0.00	342.400	32.41	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .9.58 to 9.97	3.51	0.46	0.00	342.400	32.45	342.400	0.000	0.0
. . . .9.20 to 9.58	3.53	0.46	0.00	342.400	32.50	342.400	0.000	0.0
. . . .8.82 to 9.20	3.55	0.46	0.00	342.400	32.54	342.400	0.000	0.0
. . . .8.43 to 8.82	3.57	0.46	0.00	342.400	32.59	342.400	0.000	0.0
. . . .8.05 to 8.43	3.59	0.46	0.00	342.400	32.64	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .7.67 to 8.05	3.61	0.46	0.00	342.400	32.68	342.400	0.000	0.0
. . . .7.28 to 7.67	3.63	0.46	0.00	342.400	32.73	342.400	0.000	0.0
. . . .6.90 to 7.28	3.64	0.46	0.00	342.400	32.77	342.400	0.000	0.0
. . . .6.52 to 6.90	3.66	0.46	0.00	342.400	32.82	342.400	0.000	0.0
. . . .6.13 to 6.52	3.68	0.46	0.00	342.400	32.86	342.400	0.000	0.0
. . . .5.75 to 6.13	3.70	0.46	0.00	342.400	32.91	342.400	0.000	0.0
. . . .5.37 to 5.75	3.72	0.46	0.00	342.400	32.95	342.400	0.000	0.0
. . . .4.98 to 5.37	3.74	0.46	0.00	342.400	33.00	342.400	0.000	0.0
. . . .4.60 to 4.98	3.76	0.46	0.00	342.400	33.04	342.400	0.000	0.0
. . . .4.22 to 4.60	3.78	0.46	0.00	342.400	33.09	342.400	0.000	0.0
. . . .3.83 to 4.22	3.80	0.46	0.00	342.400	33.13	342.400	0.000	0.0
. . . .3.45 to 3.83	3.82	0.46	0.00	342.400	33.18	342.400	0.000	0.0
. . . .3.07 to 3.45	3.84	0.46	0.00	342.400	33.22	342.400	0.000	0.0
. . . .2.68 to 3.07	3.86	0.46	0.00	342.400	33.27	342.400	0.000	0.0
. . . .2.30 to 2.68	3.88	0.46	0.00	342.400	33.31	342.400	0.000	0.0
. . . .1.92 to 2.30	3.90	0.46	0.00	342.400	33.36	342.400	0.000	0.0
. . . .1.53 to 1.92	3.92	0.46	0.00	342.400	33.40	342.400	0.000	0.0
. . . .1.15 to 1.53	3.94	0.46	0.00	342.400	33.45	342.400	0.000	0.0
. . . .0.77 to 1.15	3.96	0.46	0.00	342.400	33.49	342.400	0.000	0.0
. . . .0.38 to 0.77	3.98	0.46	0.00	342.400	33.54	342.400	0.000	0.0
. . . .0.00 to 0.38	4.00	0.46	0.00	342.400	33.58	342.400	0.000	0.0
+D+L								
. . . .11.12 to 11.50	4.13	0.46	0.00	342.400	33.88	342.400	0.000	0.0
. . . .10.73 to 11.12	4.15	0.46	0.00	342.400	33.93	342.400	0.000	0.0
. . . .10.35 to 10.73	4.17	0.46	0.00	342.400	33.97	342.400	0.000	0.0
. . . .9.97 to 10.35	4.19	0.46	0.00	342.400	34.02	342.400	0.000	0.0
. . . .9.58 to 9.97	4.21	0.46	0.00	342.400	34.06	342.400	0.000	0.0
. . . .9.20 to 9.58	4.23	0.46	0.00	342.400	34.11	342.400	0.000	0.0
. . . .8.82 to 9.20	4.25	0.46	0.00	342.400	34.15	342.400	0.000	0.0
. . . .8.43 to 8.82	4.27	0.46	0.00	342.400	34.19	342.400	0.000	0.0
. . . .8.05 to 8.43	4.29	0.46	0.00	342.400	34.24	342.400	0.000	0.0
. . . .7.67 to 8.05	4.31	0.46	0.00	342.400	34.28	342.400	0.000	0.0
. . . .7.28 to 7.67	4.33	0.46	0.00	342.400	34.33	342.400	0.000	0.0
. . . .6.90 to 7.28	4.34	0.46	0.00	342.400	34.37	342.400	0.000	0.0
. . . .6.52 to 6.90	4.36	0.46	0.00	342.400	34.42	342.400	0.000	0.0
. . . .6.13 to 6.52	4.38	0.46	0.00	342.400	34.46	342.400	0.000	0.0
. . . .5.75 to 6.13	4.40	0.46	0.00	342.400	34.50	342.400	0.000	0.0
. . . .5.37 to 5.75	4.42	0.46	0.00	342.400	34.55	342.400	0.000	0.0
. . . .4.98 to 5.37	4.44	0.46	0.00	342.400	34.59	342.400	0.000	0.0
. . . .4.60 to 4.98	4.46	0.46	0.00	342.400	34.64	342.400	0.000	0.0
. . . .4.22 to 4.60	4.48	0.46	0.00	342.400	34.68	342.400	0.000	0.0
. . . .3.83 to 4.22	4.50	0.46	0.00	342.400	34.72	342.400	0.000	0.0
. . . .3.45 to 3.83	4.52	0.46	0.00	342.400	34.77	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .3.07 to 3.45	4.54	0.46	0.00	342.400	34.81	342.400	0.000	0.0
. . . .2.68 to 3.07	4.56	0.46	0.00	342.400	34.85	342.400	0.000	0.0
. . . .2.30 to 2.68	4.58	0.46	0.00	342.400	34.90	342.400	0.000	0.0
. . . .1.92 to 2.30	4.60	0.46	0.00	342.400	34.94	342.400	0.000	0.0
. . . .1.53 to 1.92	4.62	0.46	0.00	342.400	34.99	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .1.15 to 1.53	4.64	0.46	0.00	342.400	35.03	342.400	0.000	0.0
. . . .0.77 to 1.15	4.66	0.46	0.00	342.400	35.07	342.400	0.000	0.0
. . . .0.38 to 0.77	4.68	0.46	0.00	342.400	35.12	342.400	0.000	0.0
. . . .0.00 to 0.38	4.70	0.46	0.00	342.400	35.16	342.400	0.000	0.0
+D+0.750L								
. . . .11.12 to 11.50	3.95	0.46	0.00	342.400	33.48	342.400	0.000	0.0
. . . .10.73 to 11.12	3.97	0.46	0.00	342.400	33.53	342.400	0.000	0.0
. . . .10.35 to 10.73	3.99	0.46	0.00	342.400	33.57	342.400	0.000	0.0
. . . .9.97 to 10.35	4.01	0.46	0.00	342.400	33.62	342.400	0.000	0.0
. . . .9.58 to 9.97	4.03	0.46	0.00	342.400	33.66	342.400	0.000	0.0
. . . .9.20 to 9.58	4.05	0.46	0.00	342.400	33.71	342.400	0.000	0.0
. . . .8.82 to 9.20	4.07	0.46	0.00	342.400	33.75	342.400	0.000	0.0
. . . .8.43 to 8.82	4.09	0.46	0.00	342.400	33.80	342.400	0.000	0.0
. . . .8.05 to 8.43	4.11	0.46	0.00	342.400	33.84	342.400	0.000	0.0
. . . .7.67 to 8.05	4.13	0.46	0.00	342.400	33.89	342.400	0.000	0.0
. . . .7.28 to 7.67	4.15	0.46	0.00	342.400	33.93	342.400	0.000	0.0
. . . .6.90 to 7.28	4.17	0.46	0.00	342.400	33.98	342.400	0.000	0.0
. . . .6.52 to 6.90	4.19	0.46	0.00	342.400	34.02	342.400	0.000	0.0
. . . .6.13 to 6.52	4.21	0.46	0.00	342.400	34.06	342.400	0.000	0.0
. . . .5.75 to 6.13	4.23	0.46	0.00	342.400	34.11	342.400	0.000	0.0
. . . .5.37 to 5.75	4.25	0.46	0.00	342.400	34.15	342.400	0.000	0.0
. . . .4.98 to 5.37	4.27	0.46	0.00	342.400	34.20	342.400	0.000	0.0
. . . .4.60 to 4.98	4.29	0.46	0.00	342.400	34.24	342.400	0.000	0.0
. . . .4.22 to 4.60	4.31	0.46	0.00	342.400	34.29	342.400	0.000	0.0
. . . .3.83 to 4.22	4.33	0.46	0.00	342.400	34.33	342.400	0.000	0.0
. . . .3.45 to 3.83	4.35	0.46	0.00	342.400	34.37	342.400	0.000	0.0
. . . .3.07 to 3.45	4.37	0.46	0.00	342.400	34.42	342.400	0.000	0.0
. . . .2.68 to 3.07	4.38	0.46	0.00	342.400	34.46	342.400	0.000	0.0
. . . .2.30 to 2.68	4.40	0.46	0.00	342.400	34.51	342.400	0.000	0.0
. . . .1.92 to 2.30	4.42	0.46	0.00	342.400	34.55	342.400	0.000	0.0
. . . .1.53 to 1.92	4.44	0.46	0.00	342.400	34.59	342.400	0.000	0.0
. . . .1.15 to 1.53	4.46	0.46	0.00	342.400	34.64	342.400	0.000	0.0
. . . .0.77 to 1.15	4.48	0.46	0.00	342.400	34.68	342.400	0.000	0.0
. . . .0.38 to 0.77	4.50	0.46	0.00	342.400	34.73	342.400	0.000	0.0
. . . .0.00 to 0.38	4.52	0.46	0.00	342.400	34.77	342.400	0.000	0.0
+D+0.420W								
. . . .11.12 to 11.50	3.43	0.46	0.00	342.400	32.27	342.400	0.004	999.0
. . . .10.73 to 11.12	3.45	0.46	0.11	342.400	32.32	342.400	0.011	999.0
. . . .10.35 to 10.73	3.47	0.46	0.17	342.400	32.36	342.400	0.018	999.0
. . . .9.97 to 10.35	3.49	0.46	0.24	342.400	32.41	342.400	0.025	999.0
. . . .9.58 to 9.97	3.51	0.46	0.29	342.400	32.45	342.400	0.032	999.0
. . . .9.20 to 9.58	3.53	0.46	0.34	342.400	32.50	342.400	0.039	999.0
. . . .8.82 to 9.20	3.55	0.46	0.39	342.400	32.54	342.400	0.046	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .8.43 to 8.82	3.57	0.46	0.43	342.400	32.59	342.400	0.052	999.0
. . . .8.05 to 8.43	3.59	0.46	0.47	342.400	32.64	79.703	0.059	999.0
. . . .7.67 to 8.05	3.61	0.46	0.50	342.400	32.68	52.244	0.065	999.0
. . . .7.28 to 7.67	3.62	0.46	0.53	342.400	32.73	45.708	0.070	999.0
. . . .6.90 to 7.28	3.64	0.46	0.55	342.400	32.77	42.810	0.074	999.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .6.52 to 6.90	3.66	0.46	0.56	342.400	32.82	41.304	0.078	999.0
. . . .6.13 to 6.52	3.68	0.46	0.57	342.400	32.86	40.519	0.080	999.0
. . . .5.75 to 6.13	3.70	0.46	0.58	342.400	32.91	40.198	0.081	999.0
. . . .5.37 to 5.75	3.72	0.46	0.58	342.400	32.95	40.246	0.081	999.0
. . . .4.98 to 5.37	3.74	0.46	0.57	342.400	33.00	40.665	0.080	999.0
. . . .4.60 to 4.98	3.76	0.46	0.56	342.400	33.04	41.548	0.078	999.0
. . . .4.22 to 4.60	3.78	0.46	0.55	342.400	33.09	43.153	0.074	999.0
. . . .3.83 to 4.22	3.80	0.46	0.53	342.400	33.13	46.147	0.070	999.0
. . . .3.45 to 3.83	3.82	0.46	0.50	342.400	33.18	52.741	0.065	999.0
. . . .3.07 to 3.45	3.84	0.46	0.47	342.400	33.22	79.318	0.059	999.0
. . . .2.68 to 3.07	3.86	0.46	0.43	342.400	33.27	342.400	0.052	999.0
. . . .2.30 to 2.68	3.88	0.46	0.39	342.400	33.31	342.400	0.046	999.0
. . . .1.92 to 2.30	3.90	0.46	0.34	342.400	33.36	342.400	0.039	999.0
. . . .1.53 to 1.92	3.92	0.46	0.29	342.400	33.40	342.400	0.032	999.0
. . . .1.15 to 1.53	3.94	0.46	0.24	342.400	33.45	342.400	0.025	999.0
. . . .0.77 to 1.15	3.96	0.46	0.17	342.400	33.49	342.400	0.018	999.0
. . . .0.38 to 0.77	3.98	0.46	0.11	342.400	33.54	342.400	0.011	999.0
. . . .0.00 to 0.38	4.00	0.46	0.00	342.400	33.58	342.400	0.004	999.0
+D+0.750L+0.450W								
. . . .11.12 to 11.50	3.95	0.46	0.00	342.400	33.48	342.400	0.005	999.0
. . . .10.73 to 11.12	3.97	0.46	0.12	342.400	33.53	342.400	0.015	999.0
. . . .10.35 to 10.73	3.99	0.46	0.19	342.400	33.57	342.400	0.025	999.0
. . . .9.97 to 10.35	4.01	0.46	0.26	342.400	33.62	342.400	0.034	999.0
. . . .9.58 to 9.97	4.03	0.46	0.32	342.400	33.66	342.400	0.044	999.0
. . . .9.20 to 9.58	4.05	0.46	0.37	342.400	33.71	342.400	0.053	999.0
. . . .8.82 to 9.20	4.07	0.46	0.42	342.400	33.75	342.400	0.062	999.0
. . . .8.43 to 8.82	4.09	0.46	0.47	342.400	33.80	77.804	0.071	999.0
. . . .8.05 to 8.43	4.11	0.46	0.51	342.400	33.84	50.618	0.080	999.0
. . . .7.67 to 8.05	4.13	0.46	0.54	342.400	33.89	44.490	0.088	999.0
. . . .7.28 to 7.67	4.15	0.46	0.57	342.400	33.93	41.802	0.095	999.0
. . . .6.90 to 7.28	4.17	0.46	0.60	342.400	33.97	40.381	0.101	999.0
. . . .6.52 to 6.90	4.19	0.46	0.61	342.400	34.02	39.584	0.105	999.0
. . . .6.13 to 6.52	4.21	0.46	0.63	342.400	34.06	39.157	0.108	999.0
. . . .5.75 to 6.13	4.23	0.46	0.63	342.400	34.11	38.989	0.110	999.0
. . . .5.37 to 5.75	4.25	0.46	0.63	342.400	34.15	39.035	0.110	999.0
. . . .4.98 to 5.37	4.27	0.46	0.63	342.400	34.20	39.295	0.108	999.0
. . . .4.60 to 4.98	4.29	0.46	0.62	342.400	34.24	39.815	0.105	999.0
. . . .4.22 to 4.60	4.31	0.46	0.60	342.400	34.28	40.705	0.100	999.0
. . . .3.83 to 4.22	4.33	0.46	0.57	342.400	34.33	42.220	0.095	999.0
. . . .3.45 to 3.83	4.35	0.46	0.55	342.400	34.37	44.997	0.088	999.0
. . . .3.07 to 3.45	4.36	0.46	0.51	342.400	34.42	51.170	0.080	999.0
. . . .2.68 to 3.07	4.38	0.46	0.47	342.400	34.46	77.290	0.071	999.0
. . . .2.30 to 2.68	4.40	0.46	0.43	342.400	34.50	342.400	0.062	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .1.92 to 2.30	4.42	0.46	0.37	342.400	34.55	342.400	0.053	999.0
. . . .1.53 to 1.92	4.44	0.46	0.32	342.400	34.59	342.400	0.044	999.0
. . . .1.15 to 1.53	4.46	0.46	0.26	342.400	34.64	342.400	0.034	999.0
. . . .0.77 to 1.15	4.48	0.46	0.19	342.400	34.68	342.400	0.025	999.0
. . . .0.38 to 0.77	4.50	0.46	0.12	342.400	34.72	342.400	0.015	999.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .0.00 to 0.38	4.52	0.46	0.00	342.400	34.77	342.400	0.005	999.0
+0.60D+0.420W								
. . . .11.12 to 11.50	2.06	0.46	0.00	342.400	28.98	342.400	0.004	999.0
. . . .10.73 to 11.12	2.07	0.46	0.11	342.400	29.01	342.400	0.011	999.0
. . . .10.35 to 10.73	2.08	0.46	0.17	342.400	29.04	342.400	0.018	999.0
. . . .9.97 to 10.35	2.09	0.46	0.23	342.400	29.07	342.400	0.025	999.0
. . . .9.58 to 9.97	2.10	0.46	0.29	342.400	29.10	342.400	0.032	999.0
. . . .9.20 to 9.58	2.12	0.46	0.34	342.400	29.13	342.400	0.039	999.0
. . . .8.82 to 9.20	2.13	0.46	0.38	342.400	29.15	342.400	0.046	999.0
. . . .8.43 to 8.82	2.14	0.46	0.43	342.400	29.18	342.400	0.052	999.0
. . . .8.05 to 8.43	2.15	0.46	0.46	342.400	29.21	99.315	0.059	999.0
. . . .7.67 to 8.05	2.16	0.46	0.49	342.400	29.24	50.080	0.065	999.0
. . . .7.28 to 7.67	2.17	0.46	0.52	342.400	29.27	42.549	0.070	999.0
. . . .6.90 to 7.28	2.19	0.46	0.54	342.400	29.30	39.411	0.074	999.0
. . . .6.52 to 6.90	2.20	0.46	0.55	342.400	29.33	37.815	0.078	999.0
. . . .6.13 to 6.52	2.21	0.46	0.56	342.400	29.36	36.984	0.080	999.0
. . . .5.75 to 6.13	2.22	0.46	0.57	342.400	29.39	36.636	0.082	999.0
. . . .5.37 to 5.75	2.23	0.46	0.57	342.400	29.41	36.668	0.082	999.0
. . . .4.98 to 5.37	2.25	0.46	0.56	342.400	29.44	37.080	0.080	999.0
. . . .4.60 to 4.98	2.26	0.46	0.55	342.400	29.47	37.974	0.078	999.0
. . . .4.22 to 4.60	2.27	0.46	0.54	342.400	29.50	39.636	0.074	999.0
. . . .3.83 to 4.22	2.28	0.46	0.52	342.400	29.53	42.838	0.070	999.0
. . . .3.45 to 3.83	2.29	0.46	0.49	342.400	29.56	50.403	0.065	999.0
. . . .3.07 to 3.45	2.30	0.46	0.46	342.400	29.59	97.401	0.059	999.0
. . . .2.68 to 3.07	2.32	0.46	0.43	342.400	29.61	342.400	0.052	999.0
. . . .2.30 to 2.68	2.33	0.46	0.39	342.400	29.64	342.400	0.046	999.0
. . . .1.92 to 2.30	2.34	0.46	0.34	342.400	29.67	342.400	0.039	999.0
. . . .1.53 to 1.92	2.35	0.46	0.29	342.400	29.70	342.400	0.032	999.0
. . . .1.15 to 1.53	2.36	0.46	0.23	342.400	29.73	342.400	0.025	999.0
. . . .0.77 to 1.15	2.37	0.46	0.17	342.400	29.76	342.400	0.018	999.0
. . . .0.38 to 0.77	2.39	0.46	0.11	342.400	29.79	342.400	0.011	999.0
. . . .0.00 to 0.38	2.40	0.46	0.00	342.400	29.81	342.400	0.004	999.0
+D+0.70E								
. . . .11.12 to 11.50	3.43	0.46	0.00	342.400	32.27	342.400	0.000	0.0
. . . .10.73 to 11.12	3.45	0.46	0.00	342.400	32.32	342.400	0.000	0.0
. . . .10.35 to 10.73	3.47	0.46	0.00	342.400	32.36	342.400	0.000	0.0
. . . .9.97 to 10.35	3.49	0.46	0.00	342.400	32.41	342.400	0.000	0.0
. . . .9.58 to 9.97	3.51	0.46	0.00	342.400	32.45	342.400	0.000	0.0
. . . .9.20 to 9.58	3.53	0.46	0.00	342.400	32.50	342.400	0.000	0.0
. . . .8.82 to 9.20	3.55	0.46	0.00	342.400	32.54	342.400	0.000	0.0
. . . .8.43 to 8.82	3.57	0.46	0.00	342.400	32.59	342.400	0.000	0.0
. . . .8.05 to 8.43	3.59	0.46	0.00	342.400	32.64	342.400	0.000	0.0
. . . .7.67 to 8.05	3.61	0.46	0.00	342.400	32.68	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .7.28 to 7.67	3.63	0.46	0.00	342.400	32.73	342.400	0.000	0.0
. . . .6.90 to 7.28	3.64	0.46	0.00	342.400	32.77	342.400	0.000	0.0
. . . .6.52 to 6.90	3.66	0.46	0.00	342.400	32.82	342.400	0.000	0.0
. . . .6.13 to 6.52	3.68	0.46	0.00	342.400	32.86	342.400	0.000	0.0
. . . .5.75 to 6.13	3.70	0.46	0.00	342.400	32.91	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .5.37 to 5.75	3.72	0.46	0.00	342.400	32.95	342.400	0.000	0.0
. . . .4.98 to 5.37	3.74	0.46	0.00	342.400	33.00	342.400	0.000	0.0
. . . .4.60 to 4.98	3.76	0.46	0.00	342.400	33.04	342.400	0.000	0.0
. . . .4.22 to 4.60	3.78	0.46	0.00	342.400	33.09	342.400	0.000	0.0
. . . .3.83 to 4.22	3.80	0.46	0.00	342.400	33.13	342.400	0.000	0.0
. . . .3.45 to 3.83	3.82	0.46	0.00	342.400	33.18	342.400	0.000	0.0
. . . .3.07 to 3.45	3.84	0.46	0.00	342.400	33.22	342.400	0.000	0.0
. . . .2.68 to 3.07	3.86	0.46	0.00	342.400	33.27	342.400	0.000	0.0
. . . .2.30 to 2.68	3.88	0.46	0.00	342.400	33.31	342.400	0.000	0.0
. . . .1.92 to 2.30	3.90	0.46	0.00	342.400	33.36	342.400	0.000	0.0
. . . .1.53 to 1.92	3.92	0.46	0.00	342.400	33.40	342.400	0.000	0.0
. . . .1.15 to 1.53	3.94	0.46	0.00	342.400	33.45	342.400	0.000	0.0
. . . .0.77 to 1.15	3.96	0.46	0.00	342.400	33.49	342.400	0.000	0.0
. . . .0.38 to 0.77	3.98	0.46	0.00	342.400	33.54	342.400	0.000	0.0
. . . .0.00 to 0.38	4.00	0.46	0.00	342.400	33.58	342.400	0.000	0.0
+D+0.750L+0.5250E								
. . . .11.12 to 11.50	3.95	0.46	0.00	342.400	33.48	342.400	0.000	0.0
. . . .10.73 to 11.12	3.97	0.46	0.00	342.400	33.53	342.400	0.000	0.0
. . . .10.35 to 10.73	3.99	0.46	0.00	342.400	33.57	342.400	0.000	0.0
. . . .9.97 to 10.35	4.01	0.46	0.00	342.400	33.62	342.400	0.000	0.0
. . . .9.58 to 9.97	4.03	0.46	0.00	342.400	33.66	342.400	0.000	0.0
. . . .9.20 to 9.58	4.05	0.46	0.00	342.400	33.71	342.400	0.000	0.0
. . . .8.82 to 9.20	4.07	0.46	0.00	342.400	33.75	342.400	0.000	0.0
. . . .8.43 to 8.82	4.09	0.46	0.00	342.400	33.80	342.400	0.000	0.0
. . . .8.05 to 8.43	4.11	0.46	0.00	342.400	33.84	342.400	0.000	0.0
. . . .7.67 to 8.05	4.13	0.46	0.00	342.400	33.89	342.400	0.000	0.0
. . . .7.28 to 7.67	4.15	0.46	0.00	342.400	33.93	342.400	0.000	0.0
. . . .6.90 to 7.28	4.17	0.46	0.00	342.400	33.98	342.400	0.000	0.0
. . . .6.52 to 6.90	4.19	0.46	0.00	342.400	34.02	342.400	0.000	0.0
. . . .6.13 to 6.52	4.21	0.46	0.00	342.400	34.06	342.400	0.000	0.0
. . . .5.75 to 6.13	4.23	0.46	0.00	342.400	34.11	342.400	0.000	0.0
. . . .5.37 to 5.75	4.25	0.46	0.00	342.400	34.15	342.400	0.000	0.0
. . . .4.98 to 5.37	4.27	0.46	0.00	342.400	34.20	342.400	0.000	0.0
. . . .4.60 to 4.98	4.29	0.46	0.00	342.400	34.24	342.400	0.000	0.0
. . . .4.22 to 4.60	4.31	0.46	0.00	342.400	34.29	342.400	0.000	0.0
. . . .3.83 to 4.22	4.33	0.46	0.00	342.400	34.33	342.400	0.000	0.0
. . . .3.45 to 3.83	4.35	0.46	0.00	342.400	34.37	342.400	0.000	0.0
. . . .3.07 to 3.45	4.37	0.46	0.00	342.400	34.42	342.400	0.000	0.0
. . . .2.68 to 3.07	4.38	0.46	0.00	342.400	34.46	342.400	0.000	0.0
. . . .2.30 to 2.68	4.40	0.46	0.00	342.400	34.51	342.400	0.000	0.0
. . . .1.92 to 2.30	4.42	0.46	0.00	342.400	34.55	342.400	0.000	0.0
. . . .1.53 to 1.92	4.44	0.46	0.00	342.400	34.59	342.400	0.000	0.0
. . . .1.15 to 1.53	4.46	0.46	0.00	342.400	34.64	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .0.77 to 1.15	4.48	0.46	0.00	342.400	34.68	342.400	0.000	0.0
. . . .0.38 to 0.77	4.50	0.46	0.00	342.400	34.73	342.400	0.000	0.0
. . . .0.00 to 0.38	4.52	0.46	0.00	342.400	34.77	342.400	0.000	0.0
+0.60D+0.70E								
. . . .11.12 to 11.50	2.06	0.46	0.00	342.400	28.98	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .10.73 to 11.12	2.07	0.46	0.00	342.400	29.01	342.400	0.000	0.0
. . . .10.35 to 10.73	2.08	0.46	0.00	342.400	29.04	342.400	0.000	0.0
. . . .9.97 to 10.35	2.09	0.46	0.00	342.400	29.07	342.400	0.000	0.0
. . . .9.58 to 9.97	2.10	0.46	0.00	342.400	29.10	342.400	0.000	0.0
. . . .9.20 to 9.58	2.12	0.46	0.00	342.400	29.13	342.400	0.000	0.0
. . . .8.82 to 9.20	2.13	0.46	0.00	342.400	29.16	342.400	0.000	0.0
. . . .8.43 to 8.82	2.14	0.46	0.00	342.400	29.18	342.400	0.000	0.0
. . . .8.05 to 8.43	2.15	0.46	0.00	342.400	29.21	342.400	0.000	0.0
. . . .7.67 to 8.05	2.16	0.46	0.00	342.400	29.24	342.400	0.000	0.0
. . . .7.28 to 7.67	2.18	0.46	0.00	342.400	29.27	342.400	0.000	0.0
. . . .6.90 to 7.28	2.19	0.46	0.00	342.400	29.30	342.400	0.000	0.0
. . . .6.52 to 6.90	2.20	0.46	0.00	342.400	29.33	342.400	0.000	0.0
. . . .6.13 to 6.52	2.21	0.46	0.00	342.400	29.36	342.400	0.000	0.0
. . . .5.75 to 6.13	2.22	0.46	0.00	342.400	29.39	342.400	0.000	0.0
. . . .5.37 to 5.75	2.23	0.46	0.00	342.400	29.41	342.400	0.000	0.0
. . . .4.98 to 5.37	2.25	0.46	0.00	342.400	29.44	342.400	0.000	0.0
. . . .4.60 to 4.98	2.26	0.46	0.00	342.400	29.47	342.400	0.000	0.0
. . . .4.22 to 4.60	2.27	0.46	0.00	342.400	29.50	342.400	0.000	0.0
. . . .3.83 to 4.22	2.28	0.46	0.00	342.400	29.53	342.400	0.000	0.0
. . . .3.45 to 3.83	2.29	0.46	0.00	342.400	29.56	342.400	0.000	0.0
. . . .3.07 to 3.45	2.30	0.46	0.00	342.400	29.59	342.400	0.000	0.0
. . . .2.68 to 3.07	2.32	0.46	0.00	342.400	29.61	342.400	0.000	0.0
. . . .2.30 to 2.68	2.33	0.46	0.00	342.400	29.64	342.400	0.000	0.0
. . . .1.92 to 2.30	2.34	0.46	0.00	342.400	29.67	342.400	0.000	0.0
. . . .1.53 to 1.92	2.35	0.46	0.00	342.400	29.70	342.400	0.000	0.0
. . . .1.15 to 1.53	2.36	0.46	0.00	342.400	29.73	342.400	0.000	0.0
. . . .0.77 to 1.15	2.37	0.46	0.00	342.400	29.76	342.400	0.000	0.0
. . . .0.38 to 0.77	2.39	0.46	0.00	342.400	29.79	342.400	0.000	0.0
. . . .0.00 to 0.38	2.40	0.46	0.00	342.400	29.81	342.400	0.000	0.0
L Only								
. . . .11.12 to 11.50	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .10.73 to 11.12	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .10.35 to 10.73	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .9.97 to 10.35	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .9.58 to 9.97	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .9.20 to 9.58	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .8.82 to 9.20	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .8.43 to 8.82	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .8.05 to 8.43	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .7.67 to 8.05	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .7.28 to 7.67	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .6.90 to 7.28	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .6.52 to 6.90	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

. . . .6.13 to 6.52	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .5.75 to 6.13	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .5.37 to 5.75	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .4.98 to 5.37	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .4.60 to 4.98	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .4.22 to 4.60	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .3.83 to 4.22	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .3.45 to 3.83	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .3.07 to 3.45	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .2.68 to 3.07	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .2.30 to 2.68	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .1.92 to 2.30	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .1.53 to 1.92	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .1.15 to 1.53	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .0.77 to 1.15	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .0.38 to 0.77	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
. . . .0.00 to 0.38	0.70	0.46	0.00	342.400	25.54	342.400	0.000	0.0
+0.420W								
. . . .11.12 to 11.50	0.00	0.46	0.00	342.400	23.68	342.400	0.004	999.0
. . . .10.73 to 11.12	0.00	0.46	0.10	342.400	23.68	342.400	0.011	999.0
. . . .10.35 to 10.73	0.00	0.46	0.17	342.400	23.68	342.400	0.019	999.0
. . . .9.97 to 10.35	0.00	0.46	0.23	342.400	23.68	342.400	0.026	999.0
. . . .9.58 to 9.97	0.00	0.46	0.28	342.400	23.68	342.400	0.033	999.0
. . . .9.20 to 9.58	0.00	0.46	0.33	342.400	23.68	342.400	0.040	999.0
. . . .8.82 to 9.20	0.00	0.46	0.38	342.400	23.68	342.400	0.047	999.0
. . . .8.43 to 8.82	0.00	0.46	0.42	342.400	23.68	342.400	0.053	999.0
. . . .8.05 to 8.43	0.00	0.46	0.45	342.400	23.68	342.400	0.060	999.0
. . . .7.67 to 8.05	0.00	0.46	0.48	342.400	23.68	47.087	0.066	999.0
. . . .7.28 to 7.67	0.00	0.46	0.50	342.400	23.68	37.212	0.072	999.0
. . . .6.90 to 7.28	0.00	0.46	0.52	342.400	23.68	33.663	0.076	999.0
. . . .6.52 to 6.90	0.00	0.46	0.54	342.400	23.68	31.937	0.080	999.0
. . . .6.13 to 6.52	0.00	0.46	0.55	342.400	23.68	31.047	0.083	999.0
. . . .5.75 to 6.13	0.00	0.46	0.55	342.400	23.68	30.660	0.084	999.0
. . . .5.37 to 5.75	0.00	0.46	0.55	342.400	23.68	30.660	0.084	999.0
. . . .4.98 to 5.37	0.00	0.46	0.55	342.400	23.68	31.047	0.083	999.0
. . . .4.60 to 4.98	0.00	0.46	0.54	342.400	23.68	31.937	0.080	999.0
. . . .4.22 to 4.60	0.00	0.46	0.52	342.400	23.68	33.663	0.076	999.0
. . . .3.83 to 4.22	0.00	0.46	0.50	342.400	23.68	37.212	0.072	999.0
. . . .3.45 to 3.83	0.00	0.46	0.48	342.400	23.68	47.087	0.066	999.0
. . . .3.07 to 3.45	0.00	0.46	0.45	342.400	23.68	342.400	0.060	999.0
. . . .2.68 to 3.07	0.00	0.46	0.42	342.400	23.68	342.400	0.053	999.0
. . . .2.30 to 2.68	0.00	0.46	0.38	342.400	23.68	342.400	0.047	999.0
. . . .1.92 to 2.30	0.00	0.46	0.33	342.400	23.68	342.400	0.040	999.0
. . . .1.53 to 1.92	0.00	0.46	0.28	342.400	23.68	342.400	0.033	999.0
. . . .1.15 to 1.53	0.00	0.46	0.23	342.400	23.68	342.400	0.026	999.0
. . . .0.77 to 1.15	0.00	0.46	0.17	342.400	23.68	342.400	0.019	999.0
. . . .0.38 to 0.77	0.00	0.46	0.10	342.400	23.68	342.400	0.011	999.0
. . . .0.00 to 0.38	0.00	0.46	0.00	342.400	23.68	342.400	0.004	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 1ST FLOOR CMU WALLS

E Only

. . . .11.12 to 11.50	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .10.73 to 11.12	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .10.35 to 10.73	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .9.97 to 10.35	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .9.58 to 9.97	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .9.20 to 9.58	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.82 to 9.20	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.43 to 8.82	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.05 to 8.43	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .7.67 to 8.05	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .7.28 to 7.67	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.90 to 7.28	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.52 to 6.90	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.13 to 6.52	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.75 to 6.13	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.37 to 5.75	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.98 to 5.37	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.60 to 4.98	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.22 to 4.60	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.83 to 4.22	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.45 to 3.83	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.07 to 3.45	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.68 to 3.07	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.30 to 2.68	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.92 to 2.30	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.53 to 1.92	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.15 to 1.53	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.77 to 1.15	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.38 to 0.77	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.00 to 0.38	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

Code References

Calculations per TMS 402-16, IBC 2021, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2021, ASCE 7-16

Construction Type : Grouted Hollow Concrete Masonry

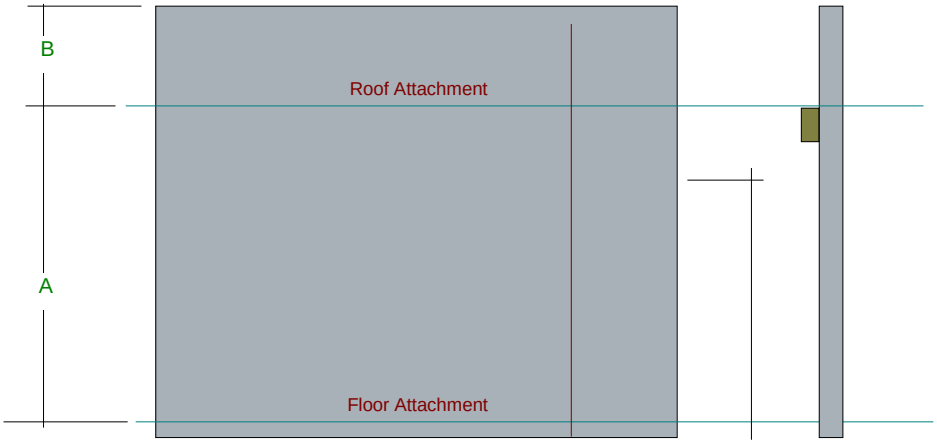
F'm	=	1.50 ksi	Nom. Wall Thickness		8	in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness		7.625	in	Min Allow Out-of-plane Defl Ra	=	0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance		3.8125	in			
Em = f'm *	=	900.0	Lower Level Rebar . . .				Minimum Vertical Steel %	=	0.0020
Max % of ρ bal.	=	0.006683	Bar Size	#	5				
Grout Density	=	140 pcf	Bar Spacing		32	in			
Block Weight		Normal Weight							
Wall Weight	=	51.0 psf							

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height = 11.50 ft
B Parapet height = ft

Wall Support Condition Top & Bottom Pinned



Vertical Loads

Vertical Uniform Loads . . . (*Applied per foot of Strip Widt*			DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Ledger Load	Eccentricity	in	1.370		.3		k/ft
Concentric Load							k/ft

Lateral Loads

Wind Loads :
Full area WIND load 80.0 psf

Seismic Loads :
Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight
Seismic Wall Lateral Load psf

Fp 1.0 = 0.0 psf

Project Title:
Engineer:
Project ID:
Project Descr:

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

	Governing Load Combination . . .	Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check	Maximum Bending Stress Rat	**0.6728**		
	+0.90D+W	Max Mu	1.396 k-ft	Phi * Mn	2.075 k-ft
PASS	Service Deflection Check	Actual Defl. Ratio L/	1,234	Allowable Defl. Ratio	150.0
	+D+0.750L+0.450W	Max. Deflection	0.1118 in		
PASS	Axial Load Check	Max Pu / Ag	50.464 psi	Max. Allow. Defl.	0.920 in
	+1.20D+L+W	Location	5.558 ft	0.2 * f'm	300.0 psi
	Reinforcing Limit Check				
		Actual As/bd	0.002541	Max Allow As/bd	0.006685

Maximum Reactions *for Load Combination...*

Top Horizontal	W Only	0.460 k
Base Horizontal	W Only	0.460 k
Vertical Reaction	+D+L	2.257 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	0.2*f'm*b*t k	Moment Values Mcr k-ft	Mu k-ft	Phi	Phi Mn k-ft	As in^2	As Ratio	0.6 * rho bal	Bar 'd'
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+0.50W at 5.37 to 5.75	2.019	13.788	0.46	0.68	0.90	2.20	0.116	0.0025	0.0064	0.00
+1.20D+L+W at 5.37 to 5.75	2.319	13.788	0.46	1.44	0.90	2.28	0.116	0.0025	0.0063	0.00
+0.90D+W at 5.37 to 5.75	1.514	13.788	0.46	1.40	0.90	2.08	0.116	0.0025	0.0066	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00

Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	Moment Values Mcr k-ft	Mactual k-ft	Stiffness I gross in^4	I cracked in^4	I effective in^4	Deflections Deflection in	Defl. Ratio
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+D+0.420W at 5.75 to 6.13	1.663	0.46	0.57	342.40	28.00	35.214	0.082	1,683.5
+D+0.750L+0.450W at 5.75 to 6.13	1.888	0.46	0.61	342.40	28.56	33.458	0.112	1,234.1
+0.60D+0.420W at 5.75 to 6.13	0.998	0.46	0.56	342.40	26.31	33.451	0.083	1,671.8
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
+0.420W at 5.75 to 6.13	0.000	0.46	0.55	342.40	23.68	30.660	0.084	1,642.9
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.00 k	1.956 k
+D+L	0.0 k	0.00 k	2.256 k
+D+0.750L	0.0 k	0.00 k	2.181 k
+D+0.60W	0.3 k	0.28 k	1.957 k

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

+D+0.750L+0.450W	0.2 k	0.21 k	2.182 k
+0.60D+0.60W	0.3 k	0.28 k	1.174 k
+D+0.70E	0.0 k	0.00 k	1.956 k
+D+0.750L+0.5250E	0.0 k	0.00 k	2.181 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+0.60D+0.70E	0.0 k	0.00 k	1.174 k
L Only	0.0 k	0.00 k	0.300 k
W Only	0.5 k	0.46 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
Overall MAXimum Envelope								
. . . .+D+0.750L+0.450W at 11.12 to 11.	1.61	0.46	0.00	342.400	27.88	342.400	0.005	999.0
. . . .+D+0.750L+0.450W at 10.73 to 11.	1.63	0.46	0.11	342.400	27.93	342.400	0.015	999.0
. . . .+D+0.750L+0.450W at 10.35 to 10.	1.65	0.46	0.18	342.400	27.98	342.400	0.025	999.0
. . . .+D+0.750L+0.450W at 9.97 to 10.3	1.67	0.46	0.25	342.400	28.03	342.400	0.035	999.0
. . . .+D+0.750L+0.450W at 9.58 to 9.97	1.69	0.46	0.31	342.400	28.08	342.400	0.044	999.0
. . . .+D+0.750L+0.450W at 9.20 to 9.58	1.71	0.46	0.36	342.400	28.12	342.400	0.054	999.0
. . . .+D+0.750L+0.450W at 8.82 to 9.20	1.73	0.46	0.41	342.400	28.17	342.400	0.063	999.0
. . . .+D+0.750L+0.450W at 8.43 to 8.82	1.75	0.46	0.46	342.400	28.22	342.400	0.072	999.0
. . . .+D+0.750L+0.450W at 8.05 to 8.43	1.77	0.46	0.49	342.400	28.27	47.280	0.081	999.0
. . . .+D+0.750L+0.450W at 7.67 to 8.05	1.79	0.46	0.53	342.400	28.32	39.488	0.089	999.0
. . . .+D+0.750L+0.450W at 7.28 to 7.67	1.81	0.46	0.56	342.400	28.37	36.446	0.096	999.0
. . . .+D+0.750L+0.450W at 6.90 to 7.28	1.83	0.46	0.58	342.400	28.42	34.911	0.102	999.0
. . . .+D+0.750L+0.450W at 6.52 to 6.90	1.85	0.46	0.59	342.400	28.47	34.071	0.107	999.0
. . . .+D+0.750L+0.450W at 6.13 to 6.52	1.87	0.46	0.61	342.400	28.51	33.629	0.110	999.0
. . . .+D+0.750L+0.450W at 5.75 to 6.13	1.89	0.46	0.61	342.400	28.56	33.458	0.112	999.0
. . . .+D+0.750L+0.450W at 5.37 to 5.75	1.91	0.46	0.61	342.400	28.61	33.510	0.112	999.0
. . . .+D+0.750L+0.450W at 4.98 to 5.37	1.93	0.46	0.61	342.400	28.66	33.784	0.110	999.0
. . . .+D+0.750L+0.450W at 4.60 to 4.98	1.95	0.46	0.60	342.400	28.71	34.331	0.107	999.0
. . . .+D+0.750L+0.450W at 4.22 to 4.60	1.97	0.46	0.58	342.400	28.76	35.277	0.102	999.0
. . . .+D+0.750L+0.450W at 3.83 to 4.22	1.99	0.46	0.56	342.400	28.80	36.921	0.096	999.0
. . . .+D+0.750L+0.450W at 3.45 to 3.83	2.01	0.46	0.53	342.400	28.85	40.068	0.089	999.0
. . . .+D+0.750L+0.450W at 3.07 to 3.45	2.02	0.46	0.50	342.400	28.90	47.887	0.081	999.0
. . . .+D+0.750L+0.450W at 2.68 to 3.07	2.04	0.46	0.46	342.400	28.95	156.515	0.072	999.0
. . . .+D+0.750L+0.450W at 2.30 to 2.68	2.06	0.46	0.41	342.400	29.00	342.400	0.063	999.0
. . . .+D+0.750L+0.450W at 1.92 to 2.30	2.08	0.46	0.36	342.400	29.05	342.400	0.054	999.0
. . . .+D+0.750L+0.450W at 1.53 to 1.92	2.10	0.46	0.31	342.400	29.09	342.400	0.044	999.0
. . . .+D+0.750L+0.450W at 1.15 to 1.53	2.12	0.46	0.25	342.400	29.14	342.400	0.035	999.0
. . . .+D+0.750L+0.450W at 0.77 to 1.15	2.14	0.46	0.19	342.400	29.19	342.400	0.025	999.0
. . . .+D+0.750L+0.450W at 0.38 to 0.77	2.16	0.46	0.11	342.400	29.24	342.400	0.015	999.0
. . . .+D+0.750L+0.450W at 0.00 to 0.38	2.18	0.46	0.00	342.400	29.29	342.400	0.005	999.0
D Only								
. . . .11.12 to 11.50	1.39	0.46	0.00	342.400	27.31	342.400	0.000	0.0
. . . .10.73 to 11.12	1.41	0.46	0.00	342.400	27.36	342.400	0.000	0.0
. . . .10.35 to 10.73	1.43	0.46	0.00	342.400	27.41	342.400	0.000	0.0
. . . .9.97 to 10.35	1.45	0.46	0.00	342.400	27.46	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .9.58 to 9.97	1.47	0.46	0.00	342.400	27.51	342.400	0.000	0.0
. . . .9.20 to 9.58	1.49	0.46	0.00	342.400	27.56	342.400	0.000	0.0
. . . .8.82 to 9.20	1.51	0.46	0.00	342.400	27.61	342.400	0.000	0.0
. . . .8.43 to 8.82	1.53	0.46	0.00	342.400	27.66	342.400	0.000	0.0
. . . .8.05 to 8.43	1.55	0.46	0.00	342.400	27.71	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .7.67 to 8.05	1.57	0.46	0.00	342.400	27.76	342.400	0.000	0.0
. . . .7.28 to 7.67	1.59	0.46	0.00	342.400	27.81	342.400	0.000	0.0
. . . .6.90 to 7.28	1.60	0.46	0.00	342.400	27.86	342.400	0.000	0.0
. . . .6.52 to 6.90	1.62	0.46	0.00	342.400	27.90	342.400	0.000	0.0
. . . .6.13 to 6.52	1.64	0.46	0.00	342.400	27.95	342.400	0.000	0.0
. . . .5.75 to 6.13	1.66	0.46	0.00	342.400	28.00	342.400	0.000	0.0
. . . .5.37 to 5.75	1.68	0.46	0.00	342.400	28.05	342.400	0.000	0.0
. . . .4.98 to 5.37	1.70	0.46	0.00	342.400	28.10	342.400	0.000	0.0
. . . .4.60 to 4.98	1.72	0.46	0.00	342.400	28.15	342.400	0.000	0.0
. . . .4.22 to 4.60	1.74	0.46	0.00	342.400	28.20	342.400	0.000	0.0
. . . .3.83 to 4.22	1.76	0.46	0.00	342.400	28.25	342.400	0.000	0.0
. . . .3.45 to 3.83	1.78	0.46	0.00	342.400	28.30	342.400	0.000	0.0
. . . .3.07 to 3.45	1.80	0.46	0.00	342.400	28.34	342.400	0.000	0.0
. . . .2.68 to 3.07	1.82	0.46	0.00	342.400	28.39	342.400	0.000	0.0
. . . .2.30 to 2.68	1.84	0.46	0.00	342.400	28.44	342.400	0.000	0.0
. . . .1.92 to 2.30	1.86	0.46	0.00	342.400	28.49	342.400	0.000	0.0
. . . .1.53 to 1.92	1.88	0.46	0.00	342.400	28.54	342.400	0.000	0.0
. . . .1.15 to 1.53	1.90	0.46	0.00	342.400	28.59	342.400	0.000	0.0
. . . .0.77 to 1.15	1.92	0.46	0.00	342.400	28.64	342.400	0.000	0.0
. . . .0.38 to 0.77	1.94	0.46	0.00	342.400	28.68	342.400	0.000	0.0
. . . .0.00 to 0.38	1.96	0.46	0.00	342.400	28.73	342.400	0.000	0.0
+D+L								
. . . .11.12 to 11.50	1.69	0.46	0.00	342.400	28.07	342.400	0.000	0.0
. . . .10.73 to 11.12	1.71	0.46	0.00	342.400	28.12	342.400	0.000	0.0
. . . .10.35 to 10.73	1.73	0.46	0.00	342.400	28.17	342.400	0.000	0.0
. . . .9.97 to 10.35	1.75	0.46	0.00	342.400	28.21	342.400	0.000	0.0
. . . .9.58 to 9.97	1.77	0.46	0.00	342.400	28.26	342.400	0.000	0.0
. . . .9.20 to 9.58	1.79	0.46	0.00	342.400	28.31	342.400	0.000	0.0
. . . .8.82 to 9.20	1.81	0.46	0.00	342.400	28.36	342.400	0.000	0.0
. . . .8.43 to 8.82	1.83	0.46	0.00	342.400	28.41	342.400	0.000	0.0
. . . .8.05 to 8.43	1.85	0.46	0.00	342.400	28.46	342.400	0.000	0.0
. . . .7.67 to 8.05	1.87	0.46	0.00	342.400	28.51	342.400	0.000	0.0
. . . .7.28 to 7.67	1.89	0.46	0.00	342.400	28.56	342.400	0.000	0.0
. . . .6.90 to 7.28	1.90	0.46	0.00	342.400	28.60	342.400	0.000	0.0
. . . .6.52 to 6.90	1.92	0.46	0.00	342.400	28.65	342.400	0.000	0.0
. . . .6.13 to 6.52	1.94	0.46	0.00	342.400	28.70	342.400	0.000	0.0
. . . .5.75 to 6.13	1.96	0.46	0.00	342.400	28.75	342.400	0.000	0.0
. . . .5.37 to 5.75	1.98	0.46	0.00	342.400	28.80	342.400	0.000	0.0
. . . .4.98 to 5.37	2.00	0.46	0.00	342.400	28.85	342.400	0.000	0.0
. . . .4.60 to 4.98	2.02	0.46	0.00	342.400	28.89	342.400	0.000	0.0
. . . .4.22 to 4.60	2.04	0.46	0.00	342.400	28.94	342.400	0.000	0.0
. . . .3.83 to 4.22	2.06	0.46	0.00	342.400	28.99	342.400	0.000	0.0
. . . .3.45 to 3.83	2.08	0.46	0.00	342.400	29.04	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .3.07 to 3.45	2.10	0.46	0.00	342.400	29.09	342.400	0.000	0.0
. . . .2.68 to 3.07	2.12	0.46	0.00	342.400	29.13	342.400	0.000	0.0
. . . .2.30 to 2.68	2.14	0.46	0.00	342.400	29.18	342.400	0.000	0.0
. . . .1.92 to 2.30	2.16	0.46	0.00	342.400	29.23	342.400	0.000	0.0
. . . .1.53 to 1.92	2.18	0.46	0.00	342.400	29.28	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .1.15 to 1.53	2.20	0.46	0.00	342.400	29.33	342.400	0.000	0.0
. . . .0.77 to 1.15	2.22	0.46	0.00	342.400	29.37	342.400	0.000	0.0
. . . .0.38 to 0.77	2.24	0.46	0.00	342.400	29.42	342.400	0.000	0.0
. . . .0.00 to 0.38	2.26	0.46	0.00	342.400	29.47	342.400	0.000	0.0
+D+0.750L								
. . . .11.12 to 11.50	1.61	0.46	0.00	342.400	27.88	342.400	0.000	0.0
. . . .10.73 to 11.12	1.63	0.46	0.00	342.400	27.93	342.400	0.000	0.0
. . . .10.35 to 10.73	1.65	0.46	0.00	342.400	27.98	342.400	0.000	0.0
. . . .9.97 to 10.35	1.67	0.46	0.00	342.400	28.03	342.400	0.000	0.0
. . . .9.58 to 9.97	1.69	0.46	0.00	342.400	28.08	342.400	0.000	0.0
. . . .9.20 to 9.58	1.71	0.46	0.00	342.400	28.12	342.400	0.000	0.0
. . . .8.82 to 9.20	1.73	0.46	0.00	342.400	28.17	342.400	0.000	0.0
. . . .8.43 to 8.82	1.75	0.46	0.00	342.400	28.22	342.400	0.000	0.0
. . . .8.05 to 8.43	1.77	0.46	0.00	342.400	28.27	342.400	0.000	0.0
. . . .7.67 to 8.05	1.79	0.46	0.00	342.400	28.32	342.400	0.000	0.0
. . . .7.28 to 7.67	1.81	0.46	0.00	342.400	28.37	342.400	0.000	0.0
. . . .6.90 to 7.28	1.83	0.46	0.00	342.400	28.42	342.400	0.000	0.0
. . . .6.52 to 6.90	1.85	0.46	0.00	342.400	28.47	342.400	0.000	0.0
. . . .6.13 to 6.52	1.87	0.46	0.00	342.400	28.51	342.400	0.000	0.0
. . . .5.75 to 6.13	1.89	0.46	0.00	342.400	28.56	342.400	0.000	0.0
. . . .5.37 to 5.75	1.91	0.46	0.00	342.400	28.61	342.400	0.000	0.0
. . . .4.98 to 5.37	1.93	0.46	0.00	342.400	28.66	342.400	0.000	0.0
. . . .4.60 to 4.98	1.95	0.46	0.00	342.400	28.71	342.400	0.000	0.0
. . . .4.22 to 4.60	1.97	0.46	0.00	342.400	28.76	342.400	0.000	0.0
. . . .3.83 to 4.22	1.99	0.46	0.00	342.400	28.81	342.400	0.000	0.0
. . . .3.45 to 3.83	2.01	0.46	0.00	342.400	28.85	342.400	0.000	0.0
. . . .3.07 to 3.45	2.03	0.46	0.00	342.400	28.90	342.400	0.000	0.0
. . . .2.68 to 3.07	2.04	0.46	0.00	342.400	28.95	342.400	0.000	0.0
. . . .2.30 to 2.68	2.06	0.46	0.00	342.400	29.00	342.400	0.000	0.0
. . . .1.92 to 2.30	2.08	0.46	0.00	342.400	29.05	342.400	0.000	0.0
. . . .1.53 to 1.92	2.10	0.46	0.00	342.400	29.09	342.400	0.000	0.0
. . . .1.15 to 1.53	2.12	0.46	0.00	342.400	29.14	342.400	0.000	0.0
. . . .0.77 to 1.15	2.14	0.46	0.00	342.400	29.19	342.400	0.000	0.0
. . . .0.38 to 0.77	2.16	0.46	0.00	342.400	29.24	342.400	0.000	0.0
. . . .0.00 to 0.38	2.18	0.46	0.00	342.400	29.29	342.400	0.000	0.0
+D+0.420W								
. . . .11.12 to 11.50	1.39	0.46	0.00	342.400	27.31	342.400	0.004	999.0
. . . .10.73 to 11.12	1.41	0.46	0.11	342.400	27.36	342.400	0.011	999.0
. . . .10.35 to 10.73	1.43	0.46	0.17	342.400	27.41	342.400	0.018	999.0
. . . .9.97 to 10.35	1.45	0.46	0.23	342.400	27.46	342.400	0.025	999.0
. . . .9.58 to 9.97	1.47	0.46	0.29	342.400	27.51	342.400	0.032	999.0
. . . .9.20 to 9.58	1.49	0.46	0.34	342.400	27.56	342.400	0.039	999.0
. . . .8.82 to 9.20	1.51	0.46	0.38	342.400	27.61	342.400	0.046	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .8.43 to 8.82	1.53	0.46	0.42	342.400	27.66	342.400	0.053	999.0
. . . .8.05 to 8.43	1.55	0.46	0.46	342.400	27.71	129.353	0.059	999.0
. . . .7.67 to 8.05	1.57	0.46	0.49	342.400	27.76	49.146	0.065	999.0
. . . .7.28 to 7.67	1.58	0.46	0.51	342.400	27.81	41.162	0.070	999.0
. . . .6.90 to 7.28	1.60	0.46	0.53	342.400	27.85	37.957	0.075	999.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .6.52 to 6.90	1.62	0.46	0.55	342.400	27.90	36.358	0.078	999.0
. . . .6.13 to 6.52	1.64	0.46	0.56	342.400	27.95	35.542	0.081	999.0
. . . .5.75 to 6.13	1.66	0.46	0.57	342.400	28.00	35.214	0.082	999.0
. . . .5.37 to 5.75	1.68	0.46	0.57	342.400	28.05	35.268	0.082	999.0
. . . .4.98 to 5.37	1.70	0.46	0.56	342.400	28.10	35.706	0.081	999.0
. . . .4.60 to 4.98	1.72	0.46	0.55	342.400	28.15	36.633	0.078	999.0
. . . .4.22 to 4.60	1.74	0.46	0.54	342.400	28.20	38.346	0.075	999.0
. . . .3.83 to 4.22	1.76	0.46	0.51	342.400	28.25	41.662	0.070	999.0
. . . .3.45 to 3.83	1.78	0.46	0.49	342.400	28.29	49.700	0.065	999.0
. . . .3.07 to 3.45	1.80	0.46	0.46	342.400	28.34	118.518	0.059	999.0
. . . .2.68 to 3.07	1.82	0.46	0.42	342.400	28.39	342.400	0.053	999.0
. . . .2.30 to 2.68	1.84	0.46	0.38	342.400	28.44	342.400	0.046	999.0
. . . .1.92 to 2.30	1.86	0.46	0.34	342.400	28.49	342.400	0.039	999.0
. . . .1.53 to 1.92	1.88	0.46	0.29	342.400	28.54	342.400	0.032	999.0
. . . .1.15 to 1.53	1.90	0.46	0.23	342.400	28.59	342.400	0.025	999.0
. . . .0.77 to 1.15	1.92	0.46	0.17	342.400	28.63	342.400	0.018	999.0
. . . .0.38 to 0.77	1.94	0.46	0.11	342.400	28.68	342.400	0.011	999.0
. . . .0.00 to 0.38	1.96	0.46	0.00	342.400	28.73	342.400	0.004	999.0
+D+0.750L+0.450W								
. . . .11.12 to 11.50	1.61	0.46	0.00	342.400	27.88	342.400	0.005	999.0
. . . .10.73 to 11.12	1.63	0.46	0.11	342.400	27.93	342.400	0.015	999.0
. . . .10.35 to 10.73	1.65	0.46	0.18	342.400	27.98	342.400	0.025	999.0
. . . .9.97 to 10.35	1.67	0.46	0.25	342.400	28.03	342.400	0.035	999.0
. . . .9.58 to 9.97	1.69	0.46	0.31	342.400	28.08	342.400	0.044	999.0
. . . .9.20 to 9.58	1.71	0.46	0.36	342.400	28.12	342.400	0.054	999.0
. . . .8.82 to 9.20	1.73	0.46	0.41	342.400	28.17	342.400	0.063	999.0
. . . .8.43 to 8.82	1.75	0.46	0.46	342.400	28.22	342.400	0.072	999.0
. . . .8.05 to 8.43	1.77	0.46	0.49	342.400	28.27	47.280	0.081	999.0
. . . .7.67 to 8.05	1.79	0.46	0.53	342.400	28.32	39.488	0.089	999.0
. . . .7.28 to 7.67	1.81	0.46	0.56	342.400	28.37	36.446	0.096	999.0
. . . .6.90 to 7.28	1.83	0.46	0.58	342.400	28.42	34.911	0.102	999.0
. . . .6.52 to 6.90	1.85	0.46	0.59	342.400	28.47	34.071	0.107	999.0
. . . .6.13 to 6.52	1.87	0.46	0.61	342.400	28.51	33.629	0.110	999.0
. . . .5.75 to 6.13	1.89	0.46	0.61	342.400	28.56	33.458	0.112	999.0
. . . .5.37 to 5.75	1.91	0.46	0.61	342.400	28.61	33.510	0.112	999.0
. . . .4.98 to 5.37	1.93	0.46	0.61	342.400	28.66	33.784	0.110	999.0
. . . .4.60 to 4.98	1.95	0.46	0.60	342.400	28.71	34.331	0.107	999.0
. . . .4.22 to 4.60	1.97	0.46	0.58	342.400	28.76	35.277	0.102	999.0
. . . .3.83 to 4.22	1.99	0.46	0.56	342.400	28.80	36.921	0.096	999.0
. . . .3.45 to 3.83	2.01	0.46	0.53	342.400	28.85	40.068	0.089	999.0
. . . .3.07 to 3.45	2.02	0.46	0.50	342.400	28.90	47.887	0.081	999.0
. . . .2.68 to 3.07	2.04	0.46	0.46	342.400	28.95	156.515	0.072	999.0
. . . .2.30 to 2.68	2.06	0.46	0.41	342.400	29.00	342.400	0.063	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .1.92 to 2.30	2.08	0.46	0.36	342.400	29.05	342.400	0.054	999.0
. . . .1.53 to 1.92	2.10	0.46	0.31	342.400	29.09	342.400	0.044	999.0
. . . .1.15 to 1.53	2.12	0.46	0.25	342.400	29.14	342.400	0.035	999.0
. . . .0.77 to 1.15	2.14	0.46	0.19	342.400	29.19	342.400	0.025	999.0
. . . .0.38 to 0.77	2.16	0.46	0.11	342.400	29.24	342.400	0.015	999.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .0.00 to 0.38	2.18	0.46	0.00	342.400	29.29	342.400	0.005	999.0
+0.60D+0.420W								
. . . .11.12 to 11.50	0.83	0.46	0.00	342.400	25.89	342.400	0.004	999.0
. . . .10.73 to 11.12	0.85	0.46	0.11	342.400	25.92	342.400	0.011	999.0
. . . .10.35 to 10.73	0.86	0.46	0.17	342.400	25.95	342.400	0.018	999.0
. . . .9.97 to 10.35	0.87	0.46	0.23	342.400	25.98	342.400	0.026	999.0
. . . .9.58 to 9.97	0.88	0.46	0.29	342.400	26.01	342.400	0.033	999.0
. . . .9.20 to 9.58	0.89	0.46	0.34	342.400	26.04	342.400	0.040	999.0
. . . .8.82 to 9.20	0.90	0.46	0.38	342.400	26.07	342.400	0.046	999.0
. . . .8.43 to 8.82	0.92	0.46	0.42	342.400	26.10	342.400	0.053	999.0
. . . .8.05 to 8.43	0.93	0.46	0.46	342.400	26.13	342.400	0.059	999.0
. . . .7.67 to 8.05	0.94	0.46	0.49	342.400	26.16	48.263	0.065	999.0
. . . .7.28 to 7.67	0.95	0.46	0.51	342.400	26.19	39.632	0.070	999.0
. . . .6.90 to 7.28	0.96	0.46	0.53	342.400	26.22	36.297	0.075	999.0
. . . .6.52 to 6.90	0.97	0.46	0.55	342.400	26.25	34.647	0.079	999.0
. . . .6.13 to 6.52	0.99	0.46	0.56	342.400	26.28	33.802	0.081	999.0
. . . .5.75 to 6.13	1.00	0.46	0.56	342.400	26.31	33.451	0.083	999.0
. . . .5.37 to 5.75	1.01	0.46	0.56	342.400	26.34	33.485	0.083	999.0
. . . .4.98 to 5.37	1.02	0.46	0.56	342.400	26.37	33.904	0.081	999.0
. . . .4.60 to 4.98	1.03	0.46	0.55	342.400	26.40	34.820	0.079	999.0
. . . .4.22 to 4.60	1.04	0.46	0.53	342.400	26.43	36.541	0.075	999.0
. . . .3.83 to 4.22	1.06	0.46	0.51	342.400	26.46	39.948	0.070	999.0
. . . .3.45 to 3.83	1.07	0.46	0.49	342.400	26.49	48.607	0.065	999.0
. . . .3.07 to 3.45	1.08	0.46	0.46	342.400	26.52	342.400	0.059	999.0
. . . .2.68 to 3.07	1.09	0.46	0.42	342.400	26.55	342.400	0.053	999.0
. . . .2.30 to 2.68	1.10	0.46	0.38	342.400	26.58	342.400	0.046	999.0
. . . .1.92 to 2.30	1.12	0.46	0.34	342.400	26.61	342.400	0.040	999.0
. . . .1.53 to 1.92	1.13	0.46	0.29	342.400	26.64	342.400	0.033	999.0
. . . .1.15 to 1.53	1.14	0.46	0.23	342.400	26.67	342.400	0.026	999.0
. . . .0.77 to 1.15	1.15	0.46	0.17	342.400	26.70	342.400	0.018	999.0
. . . .0.38 to 0.77	1.16	0.46	0.11	342.400	26.73	342.400	0.011	999.0
. . . .0.00 to 0.38	1.17	0.46	0.00	342.400	26.76	342.400	0.004	999.0
+D+0.70E								
. . . .11.12 to 11.50	1.39	0.46	0.00	342.400	27.31	342.400	0.000	0.0
. . . .10.73 to 11.12	1.41	0.46	0.00	342.400	27.36	342.400	0.000	0.0
. . . .10.35 to 10.73	1.43	0.46	0.00	342.400	27.41	342.400	0.000	0.0
. . . .9.97 to 10.35	1.45	0.46	0.00	342.400	27.46	342.400	0.000	0.0
. . . .9.58 to 9.97	1.47	0.46	0.00	342.400	27.51	342.400	0.000	0.0
. . . .9.20 to 9.58	1.49	0.46	0.00	342.400	27.56	342.400	0.000	0.0
. . . .8.82 to 9.20	1.51	0.46	0.00	342.400	27.61	342.400	0.000	0.0
. . . .8.43 to 8.82	1.53	0.46	0.00	342.400	27.66	342.400	0.000	0.0
. . . .8.05 to 8.43	1.55	0.46	0.00	342.400	27.71	342.400	0.000	0.0
. . . .7.67 to 8.05	1.57	0.46	0.00	342.400	27.76	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .7.28 to 7.67	1.59	0.46	0.00	342.400	27.81	342.400	0.000	0.0
. . . .6.90 to 7.28	1.60	0.46	0.00	342.400	27.86	342.400	0.000	0.0
. . . .6.52 to 6.90	1.62	0.46	0.00	342.400	27.90	342.400	0.000	0.0
. . . .6.13 to 6.52	1.64	0.46	0.00	342.400	27.95	342.400	0.000	0.0
. . . .5.75 to 6.13	1.66	0.46	0.00	342.400	28.00	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .5.37 to 5.75	1.68	0.46	0.00	342.400	28.05	342.400	0.000	0.0
. . . .4.98 to 5.37	1.70	0.46	0.00	342.400	28.10	342.400	0.000	0.0
. . . .4.60 to 4.98	1.72	0.46	0.00	342.400	28.15	342.400	0.000	0.0
. . . .4.22 to 4.60	1.74	0.46	0.00	342.400	28.20	342.400	0.000	0.0
. . . .3.83 to 4.22	1.76	0.46	0.00	342.400	28.25	342.400	0.000	0.0
. . . .3.45 to 3.83	1.78	0.46	0.00	342.400	28.30	342.400	0.000	0.0
. . . .3.07 to 3.45	1.80	0.46	0.00	342.400	28.34	342.400	0.000	0.0
. . . .2.68 to 3.07	1.82	0.46	0.00	342.400	28.39	342.400	0.000	0.0
. . . .2.30 to 2.68	1.84	0.46	0.00	342.400	28.44	342.400	0.000	0.0
. . . .1.92 to 2.30	1.86	0.46	0.00	342.400	28.49	342.400	0.000	0.0
. . . .1.53 to 1.92	1.88	0.46	0.00	342.400	28.54	342.400	0.000	0.0
. . . .1.15 to 1.53	1.90	0.46	0.00	342.400	28.59	342.400	0.000	0.0
. . . .0.77 to 1.15	1.92	0.46	0.00	342.400	28.64	342.400	0.000	0.0
. . . .0.38 to 0.77	1.94	0.46	0.00	342.400	28.68	342.400	0.000	0.0
. . . .0.00 to 0.38	1.96	0.46	0.00	342.400	28.73	342.400	0.000	0.0
+D+0.750L+0.5250E								
. . . .11.12 to 11.50	1.61	0.46	0.00	342.400	27.88	342.400	0.000	0.0
. . . .10.73 to 11.12	1.63	0.46	0.00	342.400	27.93	342.400	0.000	0.0
. . . .10.35 to 10.73	1.65	0.46	0.00	342.400	27.98	342.400	0.000	0.0
. . . .9.97 to 10.35	1.67	0.46	0.00	342.400	28.03	342.400	0.000	0.0
. . . .9.58 to 9.97	1.69	0.46	0.00	342.400	28.08	342.400	0.000	0.0
. . . .9.20 to 9.58	1.71	0.46	0.00	342.400	28.12	342.400	0.000	0.0
. . . .8.82 to 9.20	1.73	0.46	0.00	342.400	28.17	342.400	0.000	0.0
. . . .8.43 to 8.82	1.75	0.46	0.00	342.400	28.22	342.400	0.000	0.0
. . . .8.05 to 8.43	1.77	0.46	0.00	342.400	28.27	342.400	0.000	0.0
. . . .7.67 to 8.05	1.79	0.46	0.00	342.400	28.32	342.400	0.000	0.0
. . . .7.28 to 7.67	1.81	0.46	0.00	342.400	28.37	342.400	0.000	0.0
. . . .6.90 to 7.28	1.83	0.46	0.00	342.400	28.42	342.400	0.000	0.0
. . . .6.52 to 6.90	1.85	0.46	0.00	342.400	28.47	342.400	0.000	0.0
. . . .6.13 to 6.52	1.87	0.46	0.00	342.400	28.51	342.400	0.000	0.0
. . . .5.75 to 6.13	1.89	0.46	0.00	342.400	28.56	342.400	0.000	0.0
. . . .5.37 to 5.75	1.91	0.46	0.00	342.400	28.61	342.400	0.000	0.0
. . . .4.98 to 5.37	1.93	0.46	0.00	342.400	28.66	342.400	0.000	0.0
. . . .4.60 to 4.98	1.95	0.46	0.00	342.400	28.71	342.400	0.000	0.0
. . . .4.22 to 4.60	1.97	0.46	0.00	342.400	28.76	342.400	0.000	0.0
. . . .3.83 to 4.22	1.99	0.46	0.00	342.400	28.81	342.400	0.000	0.0
. . . .3.45 to 3.83	2.01	0.46	0.00	342.400	28.85	342.400	0.000	0.0
. . . .3.07 to 3.45	2.03	0.46	0.00	342.400	28.90	342.400	0.000	0.0
. . . .2.68 to 3.07	2.04	0.46	0.00	342.400	28.95	342.400	0.000	0.0
. . . .2.30 to 2.68	2.06	0.46	0.00	342.400	29.00	342.400	0.000	0.0
. . . .1.92 to 2.30	2.08	0.46	0.00	342.400	29.05	342.400	0.000	0.0
. . . .1.53 to 1.92	2.10	0.46	0.00	342.400	29.09	342.400	0.000	0.0
. . . .1.15 to 1.53	2.12	0.46	0.00	342.400	29.14	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .0.77 to 1.15	2.14	0.46	0.00	342.400	29.19	342.400	0.000	0.0
. . . .0.38 to 0.77	2.16	0.46	0.00	342.400	29.24	342.400	0.000	0.0
. . . .0.00 to 0.38	2.18	0.46	0.00	342.400	29.29	342.400	0.000	0.0
+0.60D+0.70E								
. . . .11.12 to 11.50	0.83	0.46	0.00	342.400	25.89	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .10.73 to 11.12	0.85	0.46	0.00	342.400	25.92	342.400	0.000	0.0
. . . .10.35 to 10.73	0.86	0.46	0.00	342.400	25.95	342.400	0.000	0.0
. . . .9.97 to 10.35	0.87	0.46	0.00	342.400	25.98	342.400	0.000	0.0
. . . .9.58 to 9.97	0.88	0.46	0.00	342.400	26.01	342.400	0.000	0.0
. . . .9.20 to 9.58	0.89	0.46	0.00	342.400	26.04	342.400	0.000	0.0
. . . .8.82 to 9.20	0.90	0.46	0.00	342.400	26.07	342.400	0.000	0.0
. . . .8.43 to 8.82	0.92	0.46	0.00	342.400	26.10	342.400	0.000	0.0
. . . .8.05 to 8.43	0.93	0.46	0.00	342.400	26.13	342.400	0.000	0.0
. . . .7.67 to 8.05	0.94	0.46	0.00	342.400	26.16	342.400	0.000	0.0
. . . .7.28 to 7.67	0.95	0.46	0.00	342.400	26.19	342.400	0.000	0.0
. . . .6.90 to 7.28	0.96	0.46	0.00	342.400	26.22	342.400	0.000	0.0
. . . .6.52 to 6.90	0.97	0.46	0.00	342.400	26.25	342.400	0.000	0.0
. . . .6.13 to 6.52	0.99	0.46	0.00	342.400	26.28	342.400	0.000	0.0
. . . .5.75 to 6.13	1.00	0.46	0.00	342.400	26.31	342.400	0.000	0.0
. . . .5.37 to 5.75	1.01	0.46	0.00	342.400	26.34	342.400	0.000	0.0
. . . .4.98 to 5.37	1.02	0.46	0.00	342.400	26.37	342.400	0.000	0.0
. . . .4.60 to 4.98	1.03	0.46	0.00	342.400	26.40	342.400	0.000	0.0
. . . .4.22 to 4.60	1.04	0.46	0.00	342.400	26.43	342.400	0.000	0.0
. . . .3.83 to 4.22	1.06	0.46	0.00	342.400	26.46	342.400	0.000	0.0
. . . .3.45 to 3.83	1.07	0.46	0.00	342.400	26.49	342.400	0.000	0.0
. . . .3.07 to 3.45	1.08	0.46	0.00	342.400	26.52	342.400	0.000	0.0
. . . .2.68 to 3.07	1.09	0.46	0.00	342.400	26.55	342.400	0.000	0.0
. . . .2.30 to 2.68	1.10	0.46	0.00	342.400	26.58	342.400	0.000	0.0
. . . .1.92 to 2.30	1.12	0.46	0.00	342.400	26.61	342.400	0.000	0.0
. . . .1.53 to 1.92	1.13	0.46	0.00	342.400	26.64	342.400	0.000	0.0
. . . .1.15 to 1.53	1.14	0.46	0.00	342.400	26.67	342.400	0.000	0.0
. . . .0.77 to 1.15	1.15	0.46	0.00	342.400	26.70	342.400	0.000	0.0
. . . .0.38 to 0.77	1.16	0.46	0.00	342.400	26.73	342.400	0.000	0.0
. . . .0.00 to 0.38	1.17	0.46	0.00	342.400	26.76	342.400	0.000	0.0
L Only								
. . . .11.12 to 11.50	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .10.73 to 11.12	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .10.35 to 10.73	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .9.97 to 10.35	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .9.58 to 9.97	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .9.20 to 9.58	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .8.82 to 9.20	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .8.43 to 8.82	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .8.05 to 8.43	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .7.67 to 8.05	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .7.28 to 7.67	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .6.90 to 7.28	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .6.52 to 6.90	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

. . . .6.13 to 6.52	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .5.75 to 6.13	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .5.37 to 5.75	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .4.98 to 5.37	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .4.60 to 4.98	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	 Mu	Inertia (in^4) Igross	 Icracked	 Ieff	Iterated Deflection (in) Deflection	 Ratio
. . . .4.22 to 4.60	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .3.83 to 4.22	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .3.45 to 3.83	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .3.07 to 3.45	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .2.68 to 3.07	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .2.30 to 2.68	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .1.92 to 2.30	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .1.53 to 1.92	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .1.15 to 1.53	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .0.77 to 1.15	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .0.38 to 0.77	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
. . . .0.00 to 0.38	0.30	0.46	0.00	342.400	24.49	342.400	0.000	0.0
+0.420W								
. . . .11.12 to 11.50	0.00	0.46	0.00	342.400	23.68	342.400	0.004	999.0
. . . .10.73 to 11.12	0.00	0.46	0.10	342.400	23.68	342.400	0.011	999.0
. . . .10.35 to 10.73	0.00	0.46	0.17	342.400	23.68	342.400	0.019	999.0
. . . .9.97 to 10.35	0.00	0.46	0.23	342.400	23.68	342.400	0.026	999.0
. . . .9.58 to 9.97	0.00	0.46	0.28	342.400	23.68	342.400	0.033	999.0
. . . .9.20 to 9.58	0.00	0.46	0.33	342.400	23.68	342.400	0.040	999.0
. . . .8.82 to 9.20	0.00	0.46	0.38	342.400	23.68	342.400	0.047	999.0
. . . .8.43 to 8.82	0.00	0.46	0.42	342.400	23.68	342.400	0.053	999.0
. . . .8.05 to 8.43	0.00	0.46	0.45	342.400	23.68	342.400	0.060	999.0
. . . .7.67 to 8.05	0.00	0.46	0.48	342.400	23.68	47.087	0.066	999.0
. . . .7.28 to 7.67	0.00	0.46	0.50	342.400	23.68	37.212	0.072	999.0
. . . .6.90 to 7.28	0.00	0.46	0.52	342.400	23.68	33.663	0.076	999.0
. . . .6.52 to 6.90	0.00	0.46	0.54	342.400	23.68	31.937	0.080	999.0
. . . .6.13 to 6.52	0.00	0.46	0.55	342.400	23.68	31.047	0.083	999.0
. . . .5.75 to 6.13	0.00	0.46	0.55	342.400	23.68	30.660	0.084	999.0
. . . .5.37 to 5.75	0.00	0.46	0.55	342.400	23.68	30.660	0.084	999.0
. . . .4.98 to 5.37	0.00	0.46	0.55	342.400	23.68	31.047	0.083	999.0
. . . .4.60 to 4.98	0.00	0.46	0.54	342.400	23.68	31.937	0.080	999.0
. . . .4.22 to 4.60	0.00	0.46	0.52	342.400	23.68	33.663	0.076	999.0
. . . .3.83 to 4.22	0.00	0.46	0.50	342.400	23.68	37.212	0.072	999.0
. . . .3.45 to 3.83	0.00	0.46	0.48	342.400	23.68	47.087	0.066	999.0
. . . .3.07 to 3.45	0.00	0.46	0.45	342.400	23.68	342.400	0.060	999.0
. . . .2.68 to 3.07	0.00	0.46	0.42	342.400	23.68	342.400	0.053	999.0
. . . .2.30 to 2.68	0.00	0.46	0.38	342.400	23.68	342.400	0.047	999.0
. . . .1.92 to 2.30	0.00	0.46	0.33	342.400	23.68	342.400	0.040	999.0
. . . .1.53 to 1.92	0.00	0.46	0.28	342.400	23.68	342.400	0.033	999.0
. . . .1.15 to 1.53	0.00	0.46	0.23	342.400	23.68	342.400	0.026	999.0
. . . .0.77 to 1.15	0.00	0.46	0.17	342.400	23.68	342.400	0.019	999.0
. . . .0.38 to 0.77	0.00	0.46	0.10	342.400	23.68	342.400	0.011	999.0
. . . .0.00 to 0.38	0.00	0.46	0.00	342.400	23.68	342.400	0.004	999.0

Masonry Slender Wall

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 2ND FLOOR CMU WALLS

E Only

. . . .11.12 to 11.50	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .10.73 to 11.12	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .10.35 to 10.73	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .9.97 to 10.35	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0

Deflections - Service Loads

Load Combination Location	Axial Load (k)	Moments (k-ft) Mcr	Mu	Inertia (in^4) Igross	Icracked	Ieff	Iterated Deflection (in) Deflection	Ratio
. . . .9.58 to 9.97	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .9.20 to 9.58	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.82 to 9.20	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.43 to 8.82	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .8.05 to 8.43	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .7.67 to 8.05	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .7.28 to 7.67	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.90 to 7.28	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.52 to 6.90	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .6.13 to 6.52	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.75 to 6.13	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .5.37 to 5.75	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.98 to 5.37	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.60 to 4.98	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .4.22 to 4.60	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.83 to 4.22	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.45 to 3.83	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .3.07 to 3.45	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.68 to 3.07	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .2.30 to 2.68	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.92 to 2.30	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.53 to 1.92	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .1.15 to 1.53	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.77 to 1.15	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.38 to 0.77	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0
. . . .0.00 to 0.38	0.00	0.46	0.00	342.400	23.68	342.400	0.000	0.0

PALACIOS
ENGINEERING LLC

Foundation Design

17323 SW 47th Ct. Miramar FL 33029 (954)-558-1505 nestor@palaciosengineering.com

PALACIOS ENGINEERING LLC

Project: 10840 SW 67th Ave.

Date:

By:

Subject: Masonry wall design.

Sheet: of

Design of Garage cmu walls

Ht = 12.83'

RDL = 1370 #/ft
RLL = 300 #/ft
DL = 1350 #/ft
LL = 400 #/ft
cmu = 640 #/ft

ΣDL = 3410 #/ft
ΣLL = 700 #/ft
Zone 4 = 68 psf.
Zone 5 = 78 psf.

Provide f'm = 1500 psi

- #5 @ 32" o.c. vert.

17323 SW 47th Ct. Miramar, FL 33029 (954)-558-1505 nestor@palaciosengineering.com

PALACIOS ENGINEERING LLC

Project: 10840 SW 67th Ave.

Date:

By:

Subject: Masonry wall design.

Sheet: of

Design of Ground floor CMU

Ht = 11.5'

RDL = 1370#/ft
RLL = 300#/ft
DL = 1350#/ft
LL = 400#/ft
CMU = 690#/ft

SDL = 3410#/ft
SLL = 700#/ft

Zone 4 = 69psf
Zone 5 = 80psf

Provide f'm = 1500psi

-#5 @ 32" o.c. vert.

17323 SW 47th Ct. Miramar, FL 33029 (954)-558-1505 nestor@palaciosengineering.com

PALACIOS ENGINEERING LLC

Project: 10840 SW 67th Ave.

Date:

By:

Subject: Masonry wall design.

Sheet: of

Design of 2nd floor conn walls

Ht: 11.5'

ROL = 10'(125psf.) + 2(60psf) = 1370#/ft.

RLL = 300#/ft

Zone (4) = 69psf.

Zone (5) = 80psf.

@ Provide f'm = 1500psi

- #5 @ 32" o.c. vert.

17323 SW 47th Ct. Miramar, FL 33029 (954)-558-1505 nestor@palaciosengineering.com

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: TYP 1 STORY WALL FOOTER

Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Reference Depth below Surface	=	ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

Adjusted Allowable Bearing Pressure = 3.0 ksf

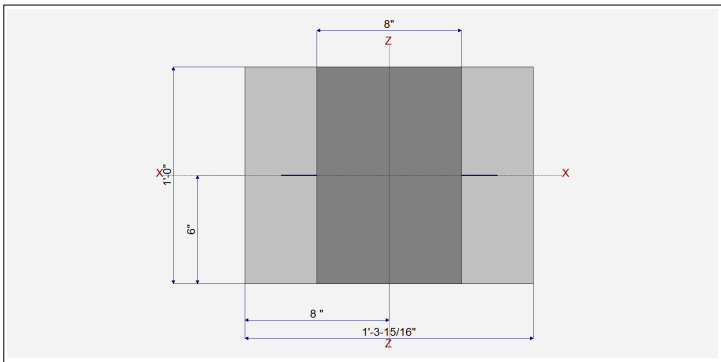
Dimensions

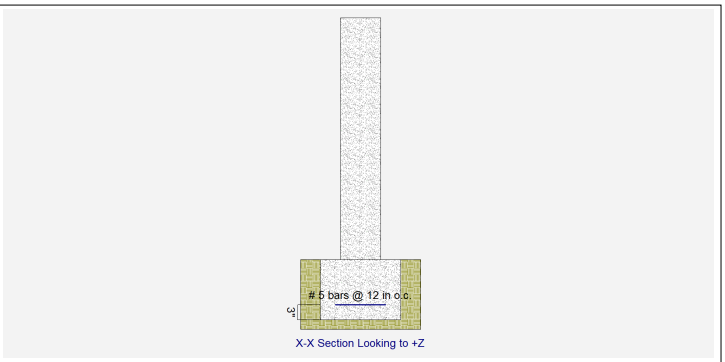
Footing Width	=	1.33 ft
Wall Thickness	=	8.0 in
Wall center offset from center of footing	=	0 in

Footing Thickness	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

Reinforcing

Bars along X-X Axis		
Bar spacing	=	12.00
Reinforcing Bar Size	=	# 5





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	2.495		0.340		-1.30			k
OB : Overburden	=								ksf
V-x	=								k
M-zz	=								k-ft

Vx applied = in above top of footing

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: TYP 1 STORY WALL FOOTER

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	2.068	Uplift	-0.780 k	1.613 k	+0.60D+0.60W

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7589	Soil Bearing	2.277 ksf	3.0 ksf	+D+L
PASS	0.01285	Z Flexure (+X)	0.1559 k-ft	12.131 k-ft	+1.20D+1.60L
PASS	0.008247	Z Flexure (-X)	0.10 k-ft	12.131 k-ft	+0.90D
PASS	N/A	1-way Shear (+X)	N/A psi	46.704 psi	N/A
PASS	N/A	1-way Shear (-X)	N/A psi	46.704 psi	N/A

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio
D Only	3.0 ksf	0.0 in	2.021 ksf	2.021 ksf	0.674
+D+L	3.0 ksf	0.0 in	2.277 ksf	2.277 ksf	0.759
+D+0.750L	3.0 ksf	0.0 in	2.213 ksf	2.213 ksf	0.738
+D+0.60W	3.0 ksf	0.0 in	1.434 ksf	1.434 ksf	0.478
+D+0.750L+0.450W	3.0 ksf	0.0 in	1.773 ksf	1.773 ksf	0.591
+0.60D+0.60W	3.0 ksf	0.0 in	0.6261 ksf	0.6261 ksf	0.209
+0.60D	3.0 ksf	0.0 in	1.213 ksf	1.213 ksf	0.404

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
+1.40D	0.1556	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.40D	0.1556	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60L	0.1559	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60L	0.1559	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L	0.1474	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L	0.1474	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50W	0.1065	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50W	0.1065	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L+W	0.09369	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L+W	0.09369	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D+W	0.04628	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D+W	0.04628	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.1	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.1	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

One Way Shear

Units : k

Load Combination...	vu @ -X	vu @ +X	vu:Max	Φ vn	vu / Φ vn	Status
+1.40D	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+1.60L	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+L	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+0.50W	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+L+W	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+0.90D+W	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+0.90D	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: TYP 2 STORY WALL FOOTER

Code References

Calculations per ACI 318-19, IBC 2021, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0 ksi
fy : Rebar Yield	=	60.0 ksi
Ec : Concrete Elastic Modulus	=	3,122.0 ksi
Concrete Density	=	145.0 pcf
φ Values Flexure	=	0.90
Shear	=	0.750

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
AutoCalc Footing Weight as DL :		Yes

Soil Design Values

Allowable Soil Bearing	=	3.0 ksf
Increase Bearing By Footing Weight	=	No
Soil Passive Resistance (for Sliding)	=	250.0 pcf
Soil/Concrete Friction Coeff.	=	0.30

Increases based on footing Depth

Reference Depth below Surface	=	ft
Allow. Pressure Increase per foot of depth	=	ksf
when base footing is below	=	ft

Increases based on footing Width

Allow. Pressure Increase per foot of width	=	ksf
when footing is wider than	=	ft

Adjusted Allowable Bearing Pressure = 3.0 ksf

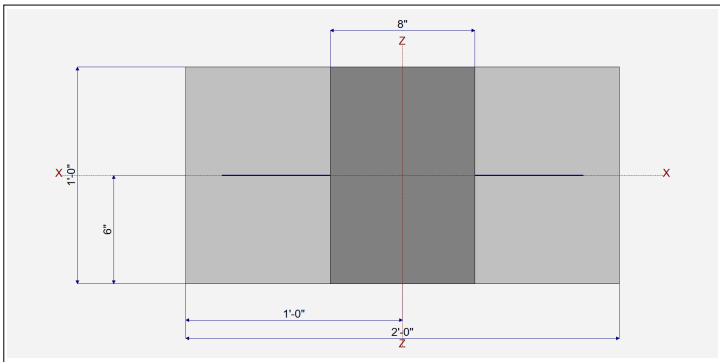
Dimensions

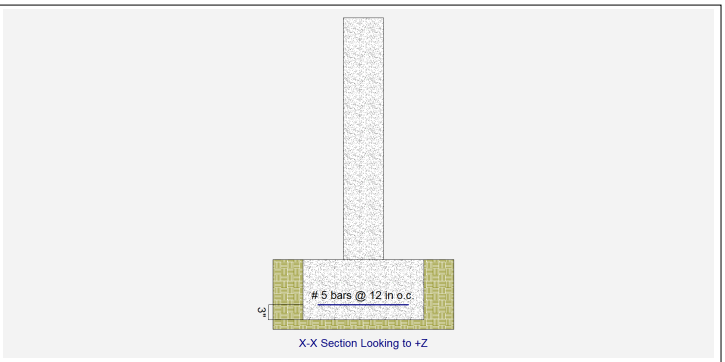
Footing Width	=	2 ft
Wall Thickness	=	8.0 in
Wall center offset from center of footing	=	0 in

Footing Thickness	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

Reinforcing

Bars along X-X Axis		
Bar spacing	=	12.00
Reinforcing Bar Size	=	# 5





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	4.280		0.70		-1.30			k
OB : Overburden	=								ksf
V-x	=								k
M-zz	=								k-ft

Vx applied = in above top of footing

Project Title:
Engineer:
Project ID:
Project Descr:

Wall Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: TYP 2 STORY WALL FOOTER

DESIGN SUMMARY

Design OK

	Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	3.515	Uplift	-0.780 k	2.742 k	+0.60D+0.60W

	Utilization Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8783	Soil Bearing	2.635 ksf	3.0 ksf	+D+L
PASS	0.06049	Z Flexure (+X)	0.7338 k-ft	12.131 k-ft	+1.20D+1.60L
PASS	0.03767	Z Flexure (-X)	0.4570 k-ft	12.131 k-ft	+0.90D
PASS	N/A	1-way Shear (+X)	N/A psi	46.704 psi	N/A
PASS	N/A	1-way Shear (-X)	N/A psi	46.704 psi	N/A

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress -X	Actual Soil Bearing Stress +X	Actual / Allowable Ratio
D Only	3.0 ksf	0.0 in	2.285 ksf	2.285 ksf	0.762
+D+L	3.0 ksf	0.0 in	2.635 ksf	2.635 ksf	0.878
+D+0.750L	3.0 ksf	0.0 in	2.548 ksf	2.548 ksf	0.849
+D+0.60W	3.0 ksf	0.0 in	1.895 ksf	1.895 ksf	0.632
+D+0.750L+0.450W	3.0 ksf	0.0 in	2.255 ksf	2.255 ksf	0.752
+0.60D+0.60W	3.0 ksf	0.0 in	0.9810 ksf	0.9810 ksf	0.327
+0.60D	3.0 ksf	0.0 in	1.371 ksf	1.371 ksf	0.457

Overturning Stability

Units : k-ft

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Sliding SafetyRatio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
+1.40D	0.7109	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.40D	0.7109	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60L	0.7338	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60L	0.7338	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L	0.6871	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L	0.6871	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50W	0.5371	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50W	0.5371	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L+W	0.5427	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+L+W	0.5427	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D+W	0.3126	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D+W	0.3126	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.457	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.457	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

One Way Shear

Units : k

Load Combination...	vu @ -X	vu @ +X	vu:Max	Φ vn	vu / Φ vn	Status
+1.40D	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+1.60L	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+L	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+0.50W	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+1.20D+L+W	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+0.90D+W	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK
+0.90D	0.0 psi	0.0 psi	0.0 psi	46.7 psi	0.000	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ C-19 GL F 10

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

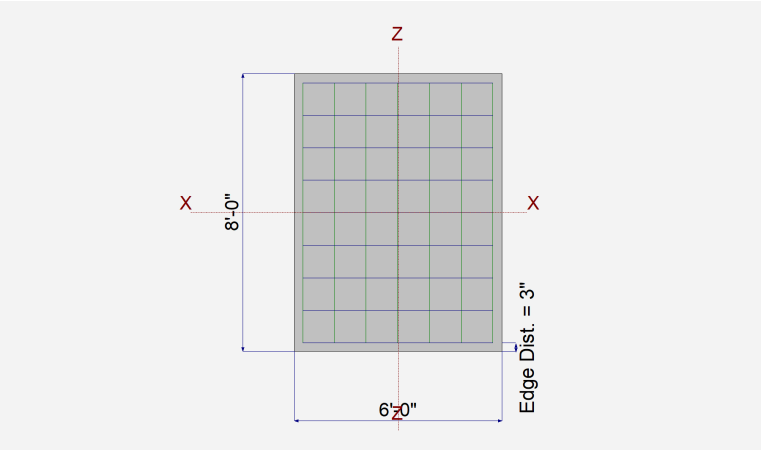
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	6.0	ft
Length parallel to Z-Z Axis	=	8.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0	in

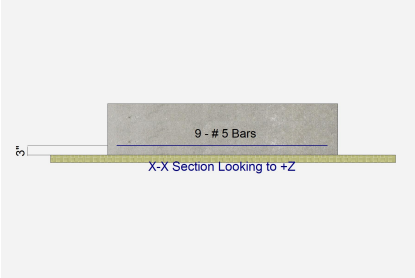
Reinforcing

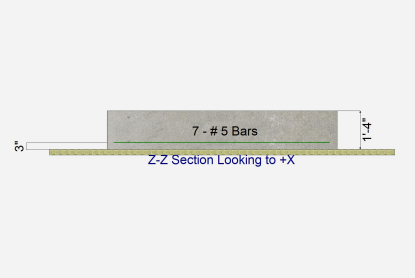
Bars parallel to X-X Axis			
Number of Bars	=		9
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		7
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	Bars along X-X Axis
# Bars required within zone	85.7 %
# Bars required on each side of zone	14.3 %





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	64.0		13.0		-14.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ C-19 GL F 10

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5993	Soil Bearing	1.798 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	5.234	Uplift	-8.40 k	43.968 k	+0.60D+0.60W
PASS	0.4606	Z Flexure (+X)	9.150 k-ft/ft	19.865 k-ft/ft	+1.20D+1.60L
PASS	0.4606	Z Flexure (-X)	9.150 k-ft/ft	19.865 k-ft/ft	+1.20D+1.60L
PASS	0.7904	X Flexure (+Z)	16.267 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.7904	X Flexure (-Z)	16.267 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.5824	1-way Shear (+X)	25.026 psi	42.971 psi	+1.20D+1.60L
PASS	0.5824	1-way Shear (-X)	25.026 psi	42.971 psi	+1.20D+1.60L
PASS	0.8631	1-way Shear (+Z)	37.538 psi	43.495 psi	+1.20D+1.60L
PASS	0.8631	1-way Shear (-Z)	37.538 psi	43.495 psi	+1.20D+1.60L
PASS	0.8565	2-way Punching	140.740 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	1.527	1.527	n/a	n/a	0.509
X-X, +D+L	3.0	n/a	0.0	1.798	1.798	n/a	n/a	0.599
X-X, +D+0.750L	3.0	n/a	0.0	1.730	1.730	n/a	n/a	0.577
X-X, +D+0.60W	3.0	n/a	0.0	1.352	1.352	n/a	n/a	0.451
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	1.599	1.599	n/a	n/a	0.533
X-X, +0.60D+0.60W	3.0	n/a	0.0	0.7410	0.7410	n/a	n/a	0.247
X-X, +0.60D	3.0	n/a	0.0	0.9160	0.9160	n/a	n/a	0.305
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	1.527	1.527	0.509
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	1.798	1.798	0.599
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	1.730	1.730	0.577
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.352	1.352	0.451
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	1.599	1.599	0.533
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	0.7410	0.7410	0.247
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	0.9160	0.9160	0.305

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	14.933	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.40D	14.933	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+1.60L	16.267	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+1.60L	16.267	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L	14.967	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L	14.967	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+0.50W	11.633	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+0.50W	11.633	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L+W	12.633	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L+W	12.633	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D+W	7.267	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ C-19 GL F 10

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	7.267	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D	9.60	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D	9.60	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.40D	8.40	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.40D	8.40	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+1.60L	9.150	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+1.60L	9.150	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+L	8.419	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+L	8.419	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+0.50W	6.544	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+0.50W	6.544	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+L+W	7.106	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +1.20D+L+W	7.106	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +0.90D+W	4.088	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +0.90D+W	4.088	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +0.90D	5.40	-X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK
Z-Z, +0.90D	5.40	+X	Bottom	0.3456	ACI 7.6.1.1	0.3488	19.865	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	22.97 psi	22.97 psi	22.97 psi	42.97 psi	0.53	OK
+1.20D+1.60L	25.03 psi	25.03 psi	25.03 psi	42.97 psi	0.58	OK
+1.20D+L	23.03 psi	23.03 psi	23.03 psi	42.97 psi	0.54	OK
+1.20D+0.50W	17.90 psi	17.90 psi	17.90 psi	42.97 psi	0.42	OK
+1.20D+L+W	19.44 psi	19.44 psi	19.44 psi	42.97 psi	0.45	OK
+0.90D+W	11.18 psi	11.18 psi	11.18 psi	42.97 psi	0.26	OK
+0.90D	14.77 psi	14.77 psi	14.77 psi	42.97 psi	0.34	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	34.46 psi	34.46 psi	34.46 psi	43.50 psi	0.79	OK
+1.20D+1.60L	37.54 psi	37.54 psi	37.54 psi	43.50 psi	0.86	OK
+1.20D+L	34.54 psi	34.54 psi	34.54 psi	43.50 psi	0.79	OK
+1.20D+0.50W	26.85 psi	26.85 psi	26.85 psi	43.50 psi	0.62	OK
+1.20D+L+W	29.15 psi	29.15 psi	29.15 psi	43.50 psi	0.67	OK
+0.90D+W	16.77 psi	16.77 psi	16.77 psi	43.50 psi	0.39	OK
+0.90D	22.15 psi	22.15 psi	22.15 psi	43.50 psi	0.51	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	129.20 psi	164.32 psi	0.7863	OK
+1.20D+1.60L	140.74 psi	164.32 psi	0.8565	OK
+1.20D+L	129.49 psi	164.32 psi	0.7881	OK
+1.20D+0.50W	100.65 psi	164.32 psi	0.6126	OK
+1.20D+L+W	109.31 psi	164.32 psi	0.6652	OK
+0.90D+W	62.87 psi	164.32 psi	0.3826	OK
+0.90D	83.06 psi	164.32 psi	0.5055	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL B 10

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

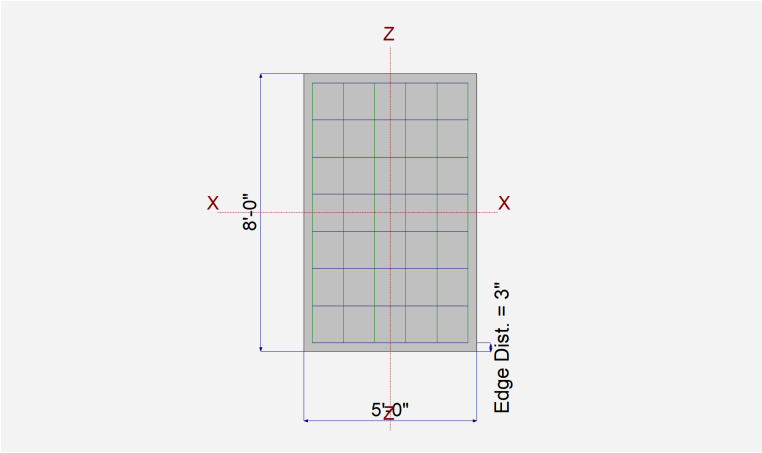
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	5.0	ft
Length parallel to Z-Z Axis	=	8.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0	in

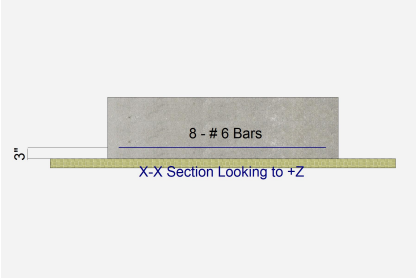
Reinforcing

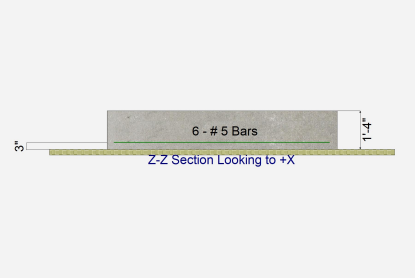
Bars parallel to X-X Axis			
Number of Bars	=		8
Reinforcing Bar Size	=	#	6
Bars parallel to Z-Z Axis			
Number of Bars	=		6
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

	Bars along X-X Axis
# Bars required within zone	76.9 %
# Bars required on each side of zone	23.1 %





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	42.0		9.0		-12.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL B 10

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4893	Soil Bearing	1.468 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	4.144	Uplift	-7.20 k	29.840 k	+0.60D+0.60W
PASS	0.2034	Z Flexure (+X)	5.063 k-ft/ft	24.886 k-ft/ft	+1.20D+1.60L
PASS	0.2034	Z Flexure (-X)	5.063 k-ft/ft	24.886 k-ft/ft	+1.20D+1.60L
PASS	0.6127	X Flexure (+Z)	12.960 k-ft/ft	21.151 k-ft/ft	+1.20D+1.60L
PASS	0.6127	X Flexure (-Z)	12.960 k-ft/ft	21.151 k-ft/ft	+1.20D+1.60L
PASS	0.3131	1-way Shear (+X)	14.538 psi	46.432 psi	+1.20D+1.60L
PASS	0.3131	1-way Shear (-X)	14.538 psi	46.432 psi	+1.20D+1.60L
PASS	0.6812	1-way Shear (+Z)	29.908 psi	43.905 psi	+1.20D+1.60L
PASS	0.6812	1-way Shear (-Z)	29.908 psi	43.905 psi	+1.20D+1.60L
PASS	0.5654	2-way Punching	92.906 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	1.243	1.243	n/a	n/a	0.414
X-X, +D+L	3.0	n/a	0.0	1.468	1.468	n/a	n/a	0.489
X-X, +D+0.750L	3.0	n/a	0.0	1.412	1.412	n/a	n/a	0.471
X-X, +D+0.60W	3.0	n/a	0.0	1.063	1.063	n/a	n/a	0.354
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	1.277	1.277	n/a	n/a	0.426
X-X, +0.60D+0.60W	3.0	n/a	0.0	0.5660	0.5660	n/a	n/a	0.189
X-X, +0.60D	3.0	n/a	0.0	0.7460	0.7460	n/a	n/a	0.249
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	1.243	1.243	0.414
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	1.468	1.468	0.489
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	1.412	1.412	0.471
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.063	1.063	0.354
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	1.277	1.277	0.426
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	0.5660	0.5660	0.189
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	0.7460	0.7460	0.249

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	11.760	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.40D	11.760	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+1.60L	12.960	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+1.60L	12.960	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L	11.880	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L	11.880	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+0.50W	8.880	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+0.50W	8.880	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L+W	9.480	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L+W	9.480	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D+W	5.160	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL B 10

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	5.160	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D	7.560	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D	7.560	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.40D	4.594	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.40D	4.594	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+1.60L	5.063	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+1.60L	5.063	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+L	4.641	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+L	4.641	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+0.50W	3.469	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+0.50W	3.469	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+L+W	3.703	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +1.20D+L+W	3.703	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +0.90D+W	2.016	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +0.90D+W	2.016	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +0.90D	2.953	-X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK
Z-Z, +0.90D	2.953	+X	Bottom	0.3456	ACI 7.6.1.1	0.440	24.886	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	13.19 psi	13.19 psi	13.19 psi	46.43 psi	0.28	OK
+1.20D+1.60L	14.54 psi	14.54 psi	14.54 psi	46.43 psi	0.31	OK
+1.20D+L	13.33 psi	13.33 psi	13.33 psi	46.43 psi	0.29	OK
+1.20D+0.50W	9.96 psi	9.96 psi	9.96 psi	46.43 psi	0.21	OK
+1.20D+L+W	10.64 psi	10.64 psi	10.64 psi	46.43 psi	0.23	OK
+0.90D+W	5.79 psi	5.79 psi	5.79 psi	46.43 psi	0.12	OK
+0.90D	8.48 psi	8.48 psi	8.48 psi	46.43 psi	0.18	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	27.14 psi	27.14 psi	27.14 psi	43.91 psi	0.62	OK
+1.20D+1.60L	29.91 psi	29.91 psi	29.91 psi	43.91 psi	0.68	OK
+1.20D+L	27.42 psi	27.42 psi	27.42 psi	43.91 psi	0.62	OK
+1.20D+0.50W	20.49 psi	20.49 psi	20.49 psi	43.91 psi	0.47	OK
+1.20D+L+W	21.88 psi	21.88 psi	21.88 psi	43.91 psi	0.50	OK
+0.90D+W	11.91 psi	11.91 psi	11.91 psi	43.91 psi	0.27	OK
+0.90D	17.45 psi	17.45 psi	17.45 psi	43.91 psi	0.40	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	84.30 psi	164.32 psi	0.5131	OK
+1.20D+1.60L	92.91 psi	164.32 psi	0.5654	OK
+1.20D+L	85.16 psi	164.32 psi	0.5183	OK
+1.20D+0.50W	63.66 psi	164.32 psi	0.3874	OK
+1.20D+L+W	67.96 psi	164.32 psi	0.4136	OK
+0.90D+W	36.99 psi	164.32 psi	0.2251	OK
+0.90D	54.20 psi	164.32 psi	0.3298	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL C 9

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

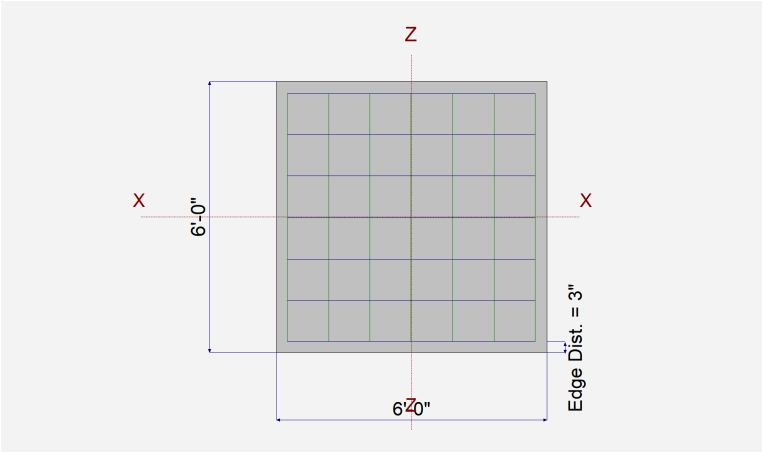
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	6.0	ft
Length parallel to Z-Z Axis	=	6.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0	in

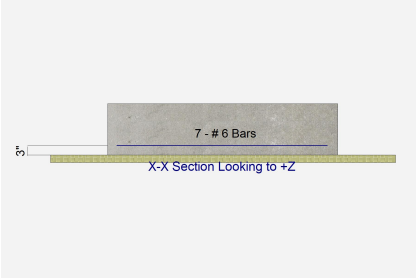
Reinforcing

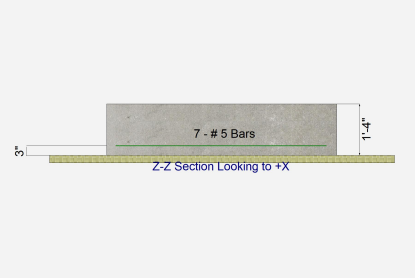
Bars parallel to X-X Axis			
Number of Bars	=		7
Reinforcing Bar Size	=	#	6
Bars parallel to Z-Z Axis			
Number of Bars	=		7
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation n/a

# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	67.0		12.0		-4.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL C 9

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7960	Soil Bearing	2.388 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	18.490	Uplift	-2.40 k	44.376 k	+0.60D+0.60W
PASS	0.4313	Z Flexure (+X)	12.450 k-ft/ft	28.867 k-ft/ft	+1.20D+1.60L
PASS	0.4313	Z Flexure (-X)	12.450 k-ft/ft	28.867 k-ft/ft	+1.20D+1.60L
PASS	0.6049	X Flexure (+Z)	12.450 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.6049	X Flexure (-Z)	12.450 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.6966	1-way Shear (+X)	34.051 psi	48.881 psi	+1.20D+1.60L
PASS	0.6966	1-way Shear (-X)	34.051 psi	48.881 psi	+1.20D+1.60L
PASS	0.7829	1-way Shear (+Z)	34.051 psi	43.495 psi	+1.20D+1.60L
PASS	0.7829	1-way Shear (-Z)	34.051 psi	43.495 psi	+1.20D+1.60L
PASS	0.8676	2-way Punching	142.564 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	2.054	2.054	n/a	n/a	0.685
X-X, +D+L	3.0	n/a	0.0	2.388	2.388	n/a	n/a	0.796
X-X, +D+0.750L	3.0	n/a	0.0	2.304	2.304	n/a	n/a	0.768
X-X, +D+0.60W	3.0	n/a	0.0	1.988	1.988	n/a	n/a	0.663
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	2.254	2.254	n/a	n/a	0.751
X-X, +0.60D+0.60W	3.0	n/a	0.0	1.166	1.166	n/a	n/a	0.389
X-X, +0.60D	3.0	n/a	0.0	1.233	1.233	n/a	n/a	0.411
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	2.054	2.054	0.685
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.388	2.388	0.796
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.304	2.304	0.768
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.988	1.988	0.663
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	2.254	2.254	0.751
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	1.166	1.166	0.389
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.233	1.233	0.411

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	11.725	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.40D	11.725	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+1.60L	12.450	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+1.60L	12.450	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L	11.550	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L	11.550	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+0.50W	9.80	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+0.50W	9.80	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L+W	11.050	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L+W	11.050	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D+W	7.038	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL C 9

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	7.038	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D	7.538	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D	7.538	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.40D	11.725	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.40D	11.725	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+1.60L	12.450	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+1.60L	12.450	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+L	11.550	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+L	11.550	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+0.50W	9.80	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+0.50W	9.80	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+L+W	11.050	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +1.20D+L+W	11.050	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +0.90D+W	7.038	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +0.90D+W	7.038	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +0.90D	7.538	-X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK
Z-Z, +0.90D	7.538	+X	Bottom	0.3456	ACI 7.6.1.1	0.5133	28.867	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	32.07 psi	32.07 psi	32.07 psi	48.88 psi	0.66	OK
+1.20D+1.60L	34.05 psi	34.05 psi	34.05 psi	48.88 psi	0.70	OK
+1.20D+L	31.59 psi	31.59 psi	31.59 psi	48.88 psi	0.65	OK
+1.20D+0.50W	26.80 psi	26.80 psi	26.80 psi	48.88 psi	0.55	OK
+1.20D+L+W	30.22 psi	30.22 psi	30.22 psi	48.88 psi	0.62	OK
+0.90D+W	19.25 psi	19.25 psi	19.25 psi	48.88 psi	0.39	OK
+0.90D	20.62 psi	20.62 psi	20.62 psi	48.88 psi	0.42	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	32.07 psi	32.07 psi	32.07 psi	43.50 psi	0.74	OK
+1.20D+1.60L	34.05 psi	34.05 psi	34.05 psi	43.50 psi	0.78	OK
+1.20D+L	31.59 psi	31.59 psi	31.59 psi	43.50 psi	0.73	OK
+1.20D+0.50W	26.80 psi	26.80 psi	26.80 psi	43.50 psi	0.62	OK
+1.20D+L+W	30.22 psi	30.22 psi	30.22 psi	43.50 psi	0.69	OK
+0.90D+W	19.25 psi	19.25 psi	19.25 psi	43.50 psi	0.44	OK
+0.90D	20.62 psi	20.62 psi	20.62 psi	43.50 psi	0.47	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	134.26 psi	164.32 psi	0.8171	OK
+1.20D+1.60L	142.56 psi	164.32 psi	0.8676	OK
+1.20D+L	132.26 psi	164.32 psi	0.8049	OK
+1.20D+0.50W	112.22 psi	164.32 psi	0.6829	OK
+1.20D+L+W	126.53 psi	164.32 psi	0.7701	OK
+0.90D+W	80.59 psi	164.32 psi	0.4904	OK
+0.90D	86.31 psi	164.32 psi	0.5253	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL C 11

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

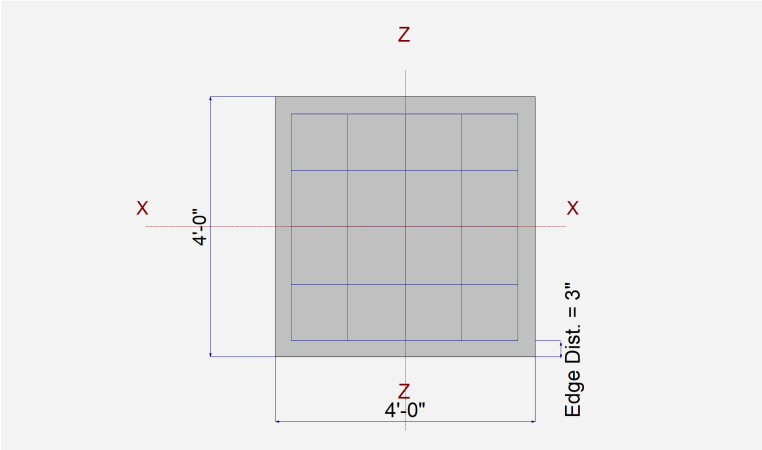
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	4.0	ft
Length parallel to Z-Z Axis	=	4.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

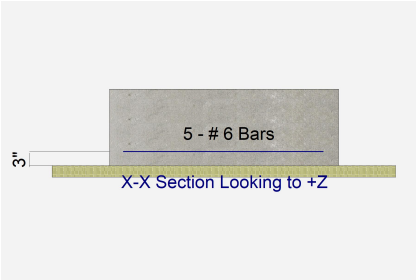
at Bottom of footing	=	3.0	in

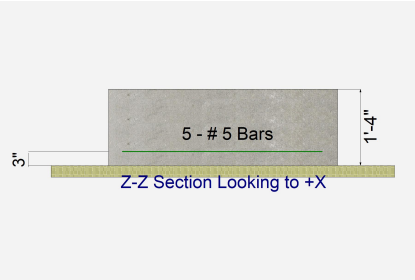
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		5
Reinforcing Bar Size	=	#	6
Bars parallel to Z-Z Axis			
Number of Bars	=		5
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	14.0		3.0		-1.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL C 11

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4187	Soil Bearing	1.256 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	17.093	Uplift	-0.60 k	10.256 k	+0.60D+0.60W
PASS	0.08755	Z Flexure (+X)	2.70 k-ft/ft	30.840 k-ft/ft	+1.20D+1.60L
PASS	0.08755	Z Flexure (-X)	2.70 k-ft/ft	30.840 k-ft/ft	+1.20D+1.60L
PASS	0.1227	X Flexure (+Z)	2.70 k-ft/ft	22.006 k-ft/ft	+1.20D+1.60L
PASS	0.1227	X Flexure (-Z)	2.70 k-ft/ft	22.006 k-ft/ft	+1.20D+1.60L
PASS	0.1592	1-way Shear (+X)	7.962 psi	50.018 psi	+1.20D+1.60L
PASS	0.1592	1-way Shear (-X)	7.962 psi	50.018 psi	+1.20D+1.60L
PASS	0.1789	1-way Shear (+Z)	7.962 psi	44.507 psi	+1.20D+1.60L
PASS	0.1789	1-way Shear (-Z)	7.962 psi	44.507 psi	+1.20D+1.60L
PASS	0.1792	2-way Punching	29.448 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	1.068	1.068	n/a	n/a	0.356
X-X, +D+L	3.0	n/a	0.0	1.256	1.256	n/a	n/a	0.419
X-X, +D+0.750L	3.0	n/a	0.0	1.209	1.209	n/a	n/a	0.403
X-X, +D+0.60W	3.0	n/a	0.0	1.031	1.031	n/a	n/a	0.344
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	1.181	1.181	n/a	n/a	0.394
X-X, +0.60D+0.60W	3.0	n/a	0.0	0.6035	0.6035	n/a	n/a	0.201
X-X, +0.60D	3.0	n/a	0.0	0.6410	0.6410	n/a	n/a	0.214
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	1.068	1.068	0.356
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	1.256	1.256	0.419
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	1.209	1.209	0.403
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.031	1.031	0.344
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	1.181	1.181	0.394
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	0.6035	0.6035	0.201
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	0.6410	0.6410	0.214

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.450	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.40D	2.450	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+1.60L	2.70	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+1.60L	2.70	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L	2.475	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L	2.475	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+0.50W	2.038	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+0.50W	2.038	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L+W	2.350	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L+W	2.350	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +0.90D+W	1.450	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL C 11

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	1.450	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +0.90D	1.575	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +0.90D	1.575	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.40D	2.450	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.40D	2.450	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+1.60L	2.70	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+1.60L	2.70	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+L	2.475	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+L	2.475	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+0.50W	2.038	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+0.50W	2.038	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+L+W	2.350	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +1.20D+L+W	2.350	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +0.90D+W	1.450	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +0.90D+W	1.450	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +0.90D	1.575	-X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK
Z-Z, +0.90D	1.575	+X	Bottom	0.3456	ACI 7.6.1.1	0.550	30.840	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.22 psi	7.22 psi	7.22 psi	50.02 psi	0.14	OK
+1.20D+1.60L	7.96 psi	7.96 psi	7.96 psi	50.02 psi	0.16	OK
+1.20D+L	7.30 psi	7.30 psi	7.30 psi	50.02 psi	0.15	OK
+1.20D+0.50W	6.01 psi	6.01 psi	6.01 psi	50.02 psi	0.12	OK
+1.20D+L+W	6.93 psi	6.93 psi	6.93 psi	50.02 psi	0.14	OK
+0.90D+W	4.28 psi	4.28 psi	4.28 psi	50.02 psi	0.09	OK
+0.90D	4.64 psi	4.64 psi	4.64 psi	50.02 psi	0.09	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.22 psi	7.22 psi	7.22 psi	44.51 psi	0.16	OK
+1.20D+1.60L	7.96 psi	7.96 psi	7.96 psi	44.51 psi	0.18	OK
+1.20D+L	7.30 psi	7.30 psi	7.30 psi	44.51 psi	0.16	OK
+1.20D+0.50W	6.01 psi	6.01 psi	6.01 psi	44.51 psi	0.14	OK
+1.20D+L+W	6.93 psi	6.93 psi	6.93 psi	44.51 psi	0.16	OK
+0.90D+W	4.28 psi	4.28 psi	4.28 psi	44.51 psi	0.10	OK
+0.90D	4.64 psi	4.64 psi	4.64 psi	44.51 psi	0.10	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	26.72 psi	164.32 psi	0.1626	OK
+1.20D+1.60L	29.45 psi	164.32 psi	0.1792	OK
+1.20D+L	26.99 psi	164.32 psi	0.1643	OK
+1.20D+0.50W	22.22 psi	164.32 psi	0.1352	OK
+1.20D+L+W	25.63 psi	164.32 psi	0.156	OK
+0.90D+W	15.81 psi	164.32 psi	0.09624	OK
+0.90D	17.18 psi	164.32 psi	0.1045	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL F9

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

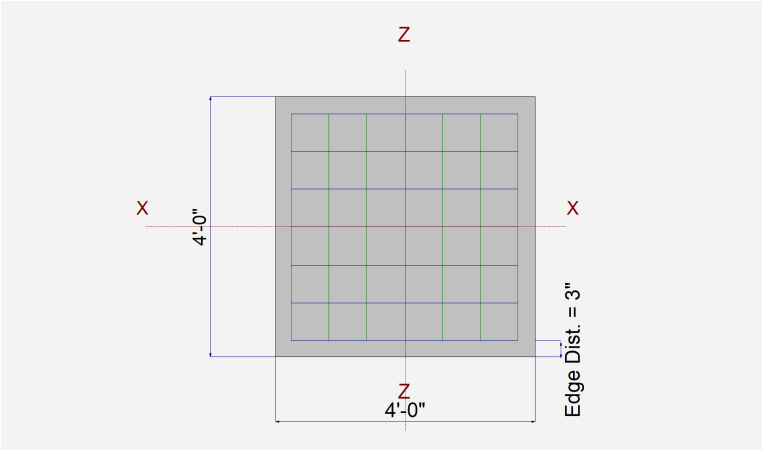
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	4.0	ft
Length parallel to Z-Z Axis	=	4.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

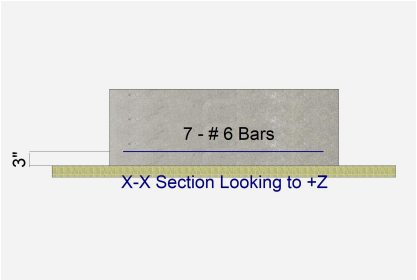
at Bottom of footing	=	3.0	in

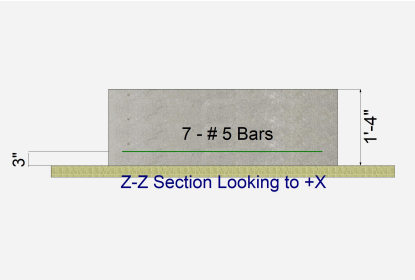
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		7.0
Reinforcing Bar Size	=	#	6
Bars parallel to Z-Z Axis			
Number of Bars	=		7.0
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	32.0		2.0		-1.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL F9

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7727	Soil Bearing	2.318 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	35.093	Uplift	-0.60 k	21.056 k	+0.60D+0.60W
PASS	0.1320	Z Flexure (+X)	5.60 k-ft/ft	42.429 k-ft/ft	+1.40D
PASS	0.1320	Z Flexure (-X)	5.60 k-ft/ft	42.429 k-ft/ft	+1.40D
PASS	0.1840	X Flexure (+Z)	5.60 k-ft/ft	30.438 k-ft/ft	+1.40D
PASS	0.1840	X Flexure (-Z)	5.60 k-ft/ft	30.438 k-ft/ft	+1.40D
PASS	0.2951	1-way Shear (+X)	16.513 psi	55.954 psi	+1.40D
PASS	0.2951	1-way Shear (-X)	16.513 psi	55.954 psi	+1.40D
PASS	0.3317	1-way Shear (+Z)	16.513 psi	49.789 psi	+1.40D
PASS	0.3317	1-way Shear (-Z)	16.513 psi	49.789 psi	+1.40D
PASS	0.3717	2-way Punching	61.076 psi	164.317 psi	+1.40D

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	2.193	2.193	n/a	n/a	0.731
X-X, +D+L	3.0	n/a	0.0	2.318	2.318	n/a	n/a	0.773
X-X, +D+0.750L	3.0	n/a	0.0	2.287	2.287	n/a	n/a	0.762
X-X, +D+0.60W	3.0	n/a	0.0	2.156	2.156	n/a	n/a	0.719
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	2.259	2.259	n/a	n/a	0.753
X-X, +0.60D+0.60W	3.0	n/a	0.0	1.279	1.279	n/a	n/a	0.426
X-X, +0.60D	3.0	n/a	0.0	1.316	1.316	n/a	n/a	0.439
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	2.193	2.193	0.731
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.318	2.318	0.773
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.287	2.287	0.762
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	2.156	2.156	0.719
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	2.259	2.259	0.753
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	1.279	1.279	0.426
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.316	1.316	0.439

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	5.60	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.40D	5.60	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+1.60L	5.20	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+1.60L	5.20	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+L	5.050	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+L	5.050	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+0.50W	4.738	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+0.50W	4.738	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+L+W	4.925	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +1.20D+L+W	4.925	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +0.90D+W	3.475	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL F9

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	3.475	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +0.90D	3.60	+Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
X-X, +0.90D	3.60	-Z	Bottom	0.3456	ACI 7.6.1.1	0.5425	30.438	OK
Z-Z, +1.40D	5.60	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.40D	5.60	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+1.60L	5.20	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+1.60L	5.20	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+L	5.050	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+L	5.050	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+0.50W	4.738	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+0.50W	4.738	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+L+W	4.925	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +1.20D+L+W	4.925	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +0.90D+W	3.475	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +0.90D+W	3.475	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +0.90D	3.60	-X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK
Z-Z, +0.90D	3.60	+X	Bottom	0.3456	ACI 7.6.1.1	0.770	42.429	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	16.51 psi	16.51 psi	16.51 psi	55.95 psi	0.30	OK
+1.20D+1.60L	15.33 psi	15.33 psi	15.33 psi	55.95 psi	0.27	OK
+1.20D+L	14.89 psi	14.89 psi	14.89 psi	55.95 psi	0.27	OK
+1.20D+0.50W	13.97 psi	13.97 psi	13.97 psi	55.95 psi	0.25	OK
+1.20D+L+W	14.52 psi	14.52 psi	14.52 psi	55.95 psi	0.26	OK
+0.90D+W	10.25 psi	10.25 psi	10.25 psi	55.95 psi	0.18	OK
+0.90D	10.62 psi	10.62 psi	10.62 psi	55.95 psi	0.19	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	16.51 psi	16.51 psi	16.51 psi	49.79 psi	0.33	OK
+1.20D+1.60L	15.33 psi	15.33 psi	15.33 psi	49.79 psi	0.31	OK
+1.20D+L	14.89 psi	14.89 psi	14.89 psi	49.79 psi	0.30	OK
+1.20D+0.50W	13.97 psi	13.97 psi	13.97 psi	49.79 psi	0.28	OK
+1.20D+L+W	14.52 psi	14.52 psi	14.52 psi	49.79 psi	0.29	OK
+0.90D+W	10.25 psi	10.25 psi	10.25 psi	49.79 psi	0.21	OK
+0.90D	10.62 psi	10.62 psi	10.62 psi	49.79 psi	0.21	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	61.08 psi	164.32 psi	0.3717	OK
+1.20D+1.60L	56.71 psi	164.32 psi	0.3451	OK
+1.20D+L	55.08 psi	164.32 psi	0.3352	OK
+1.20D+0.50W	51.67 psi	164.32 psi	0.3145	OK
+1.20D+L+W	53.72 psi	164.32 psi	0.3269	OK
+0.90D+W	37.90 psi	164.32 psi	0.2307	OK
+0.90D	39.26 psi	164.32 psi	0.239	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL I7

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

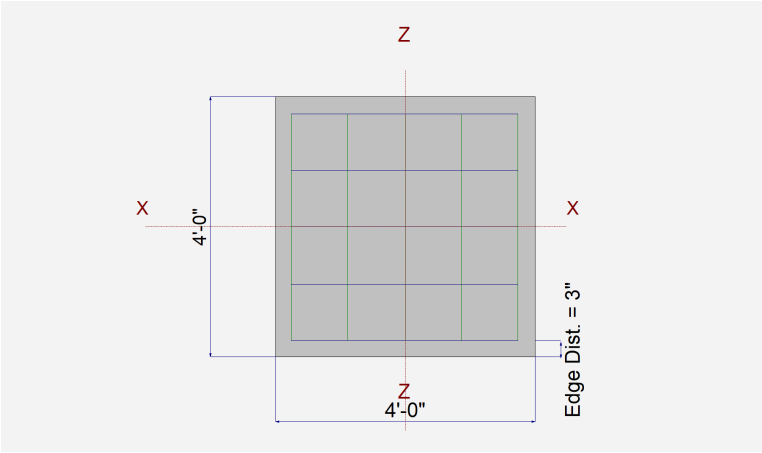
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	4.0	ft
Length parallel to Z-Z Axis	=	4.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

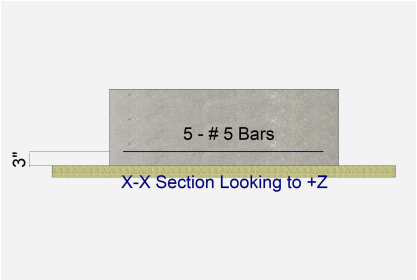
at Bottom of footing	=	3.0	in

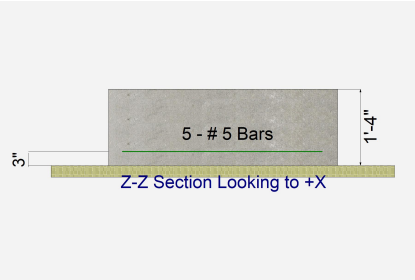
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		5
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		5
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	30.0		5.0		-2.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL I7

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7937	Soil Bearing	2.381 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	16.547	Uplift	-1.20 k	19.856 k	+0.60D+0.60W
PASS	0.2499	Z Flexure (+X)	5.50 k-ft/ft	22.006 k-ft/ft	+1.20D+1.60L
PASS	0.2499	Z Flexure (-X)	5.50 k-ft/ft	22.006 k-ft/ft	+1.20D+1.60L
PASS	0.2499	X Flexure (+Z)	5.50 k-ft/ft	22.006 k-ft/ft	+1.20D+1.60L
PASS	0.2499	X Flexure (-Z)	5.50 k-ft/ft	22.006 k-ft/ft	+1.20D+1.60L
PASS	0.3644	1-way Shear (+X)	16.218 psi	44.507 psi	+1.20D+1.60L
PASS	0.3644	1-way Shear (-X)	16.218 psi	44.507 psi	+1.20D+1.60L
PASS	0.3644	1-way Shear (+Z)	16.218 psi	44.507 psi	+1.20D+1.60L
PASS	0.3644	1-way Shear (-Z)	16.218 psi	44.507 psi	+1.20D+1.60L
PASS	0.3651	2-way Punching	59.986 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	2.068	2.068	n/a	n/a	0.689
X-X, +D+L	3.0	n/a	0.0	2.381	2.381	n/a	n/a	0.794
X-X, +D+0.750L	3.0	n/a	0.0	2.303	2.303	n/a	n/a	0.768
X-X, +D+0.60W	3.0	n/a	0.0	1.993	1.993	n/a	n/a	0.664
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	2.246	2.246	n/a	n/a	0.749
X-X, +0.60D+0.60W	3.0	n/a	0.0	1.166	1.166	n/a	n/a	0.389
X-X, +0.60D	3.0	n/a	0.0	1.241	1.241	n/a	n/a	0.414
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	2.068	2.068	0.689
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.381	2.381	0.794
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.303	2.303	0.768
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.993	1.993	0.664
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	2.246	2.246	0.749
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	1.166	1.166	0.389
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.241	1.241	0.414

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	5.250	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.40D	5.250	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+1.60L	5.50	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+1.60L	5.50	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L	5.125	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L	5.125	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+0.50W	4.375	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+0.50W	4.375	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L+W	4.875	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +1.20D+L+W	4.875	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +0.90D+W	3.125	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL I7

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	3.125	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +0.90D	3.375	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
X-X, +0.90D	3.375	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.40D	5.250	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.40D	5.250	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+1.60L	5.50	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+1.60L	5.50	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+L	5.125	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+L	5.125	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+0.50W	4.375	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+0.50W	4.375	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+L+W	4.875	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +1.20D+L+W	4.875	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +0.90D+W	3.125	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +0.90D+W	3.125	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +0.90D	3.375	-X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK
Z-Z, +0.90D	3.375	+X	Bottom	0.3456	ACI 7.6.1.1	0.3875	22.006	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	15.48 psi	15.48 psi	15.48 psi	44.51 psi	0.35	OK
+1.20D+1.60L	16.22 psi	16.22 psi	16.22 psi	44.51 psi	0.36	OK
+1.20D+L	15.11 psi	15.11 psi	15.11 psi	44.51 psi	0.34	OK
+1.20D+0.50W	12.90 psi	12.90 psi	12.90 psi	44.51 psi	0.29	OK
+1.20D+L+W	14.38 psi	14.38 psi	14.38 psi	44.51 psi	0.32	OK
+0.90D+W	9.22 psi	9.22 psi	9.22 psi	44.51 psi	0.21	OK
+0.90D	9.95 psi	9.95 psi	9.95 psi	44.51 psi	0.22	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	15.48 psi	15.48 psi	15.48 psi	44.51 psi	0.35	OK
+1.20D+1.60L	16.22 psi	16.22 psi	16.22 psi	44.51 psi	0.36	OK
+1.20D+L	15.11 psi	15.11 psi	15.11 psi	44.51 psi	0.34	OK
+1.20D+0.50W	12.90 psi	12.90 psi	12.90 psi	44.51 psi	0.29	OK
+1.20D+L+W	14.38 psi	14.38 psi	14.38 psi	44.51 psi	0.32	OK
+0.90D+W	9.22 psi	9.22 psi	9.22 psi	44.51 psi	0.21	OK
+0.90D	9.95 psi	9.95 psi	9.95 psi	44.51 psi	0.22	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	57.26 psi	164.32 psi	0.3485	OK
+1.20D+1.60L	59.99 psi	164.32 psi	0.3651	OK
+1.20D+L	55.90 psi	164.32 psi	0.3402	OK
+1.20D+0.50W	47.72 psi	164.32 psi	0.2904	OK
+1.20D+L+W	53.17 psi	164.32 psi	0.3236	OK
+0.90D+W	34.08 psi	164.32 psi	0.2074	OK
+0.90D	36.81 psi	164.32 psi	0.224	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL N6

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

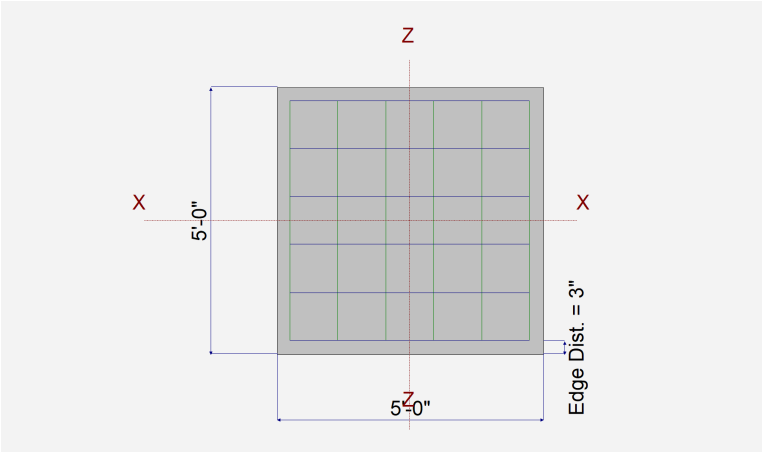
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	5.0	ft
Length parallel to Z-Z Axis	=	5.0	ft
Footing Thickness	=	16.0	in



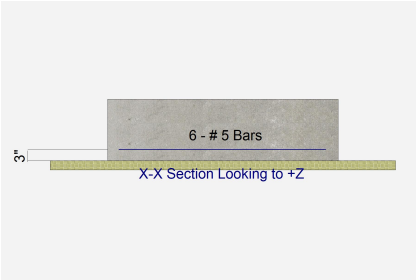
Pedestal dimensions...			
px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in
Rebar Centerline to Edge of Concrete...			
at Bottom of footing	=	3.0	in

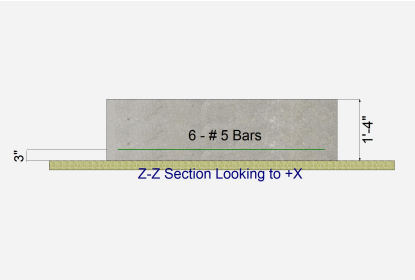
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		6.0
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		6.0
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	48.0		6.0		-10.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL N6

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7843	Soil Bearing	2.353 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	5.283	Uplift	-6.0 k	31.70 k	+0.60D+0.60W
PASS	0.3971	Z Flexure (+X)	8.40 k-ft/ft	21.151 k-ft/ft	+1.40D
PASS	0.3971	Z Flexure (-X)	8.40 k-ft/ft	21.151 k-ft/ft	+1.40D
PASS	0.3971	X Flexure (+Z)	8.40 k-ft/ft	21.151 k-ft/ft	+1.40D
PASS	0.3971	X Flexure (-Z)	8.40 k-ft/ft	21.151 k-ft/ft	+1.40D
PASS	0.5494	1-way Shear (+X)	24.123 psi	43.905 psi	+1.40D
PASS	0.5494	1-way Shear (-X)	24.123 psi	43.905 psi	+1.40D
PASS	0.5494	1-way Shear (+Z)	24.123 psi	43.905 psi	+1.40D
PASS	0.5494	1-way Shear (-Z)	24.123 psi	43.905 psi	+1.40D
PASS	0.5757	2-way Punching	94.597 psi	164.317 psi	+1.40D

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	2.113	2.113	n/a	n/a	0.704
X-X, +D+L	3.0	n/a	0.0	2.353	2.353	n/a	n/a	0.784
X-X, +D+0.750L	3.0	n/a	0.0	2.293	2.293	n/a	n/a	0.764
X-X, +D+0.60W	3.0	n/a	0.0	1.873	1.873	n/a	n/a	0.624
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	2.113	2.113	n/a	n/a	0.704
X-X, +0.60D+0.60W	3.0	n/a	0.0	1.028	1.028	n/a	n/a	0.343
X-X, +0.60D	3.0	n/a	0.0	1.268	1.268	n/a	n/a	0.423
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	2.113	2.113	0.704
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.353	2.353	0.784
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.293	2.293	0.764
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.873	1.873	0.624
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	2.113	2.113	0.704
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	1.028	1.028	0.343
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.268	1.268	0.423

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	8.40	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.40D	8.40	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+1.60L	8.40	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+1.60L	8.40	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L	7.950	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L	7.950	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+0.50W	6.575	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+0.50W	6.575	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L+W	6.70	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L+W	6.70	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D+W	4.150	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL N6

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	4.150	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D	5.40	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D	5.40	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.40D	8.40	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.40D	8.40	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+1.60L	8.40	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+1.60L	8.40	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L	7.950	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L	7.950	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+0.50W	6.575	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+0.50W	6.575	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L+W	6.70	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L+W	6.70	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D+W	4.150	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D+W	4.150	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D	5.40	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D	5.40	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	24.12 psi	24.12 psi	24.12 psi	43.91 psi	0.55	OK
+1.20D+1.60L	24.12 psi	24.12 psi	24.12 psi	43.91 psi	0.55	OK
+1.20D+L	22.83 psi	22.83 psi	22.83 psi	43.91 psi	0.52	OK
+1.20D+0.50W	18.88 psi	18.88 psi	18.88 psi	43.91 psi	0.43	OK
+1.20D+L+W	19.24 psi	19.24 psi	19.24 psi	43.91 psi	0.44	OK
+0.90D+W	11.92 psi	11.92 psi	11.92 psi	43.91 psi	0.27	OK
+0.90D	15.51 psi	15.51 psi	15.51 psi	43.91 psi	0.35	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	24.12 psi	24.12 psi	24.12 psi	43.91 psi	0.55	OK
+1.20D+1.60L	24.12 psi	24.12 psi	24.12 psi	43.91 psi	0.55	OK
+1.20D+L	22.83 psi	22.83 psi	22.83 psi	43.91 psi	0.52	OK
+1.20D+0.50W	18.88 psi	18.88 psi	18.88 psi	43.91 psi	0.43	OK
+1.20D+L+W	19.24 psi	19.24 psi	19.24 psi	43.91 psi	0.44	OK
+0.90D+W	11.92 psi	11.92 psi	11.92 psi	43.91 psi	0.27	OK
+0.90D	15.51 psi	15.51 psi	15.51 psi	43.91 psi	0.35	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	94.60 psi	164.32 psi	0.5757	OK
+1.20D+1.60L	94.60 psi	164.32 psi	0.5757	OK
+1.20D+L	89.53 psi	164.32 psi	0.5449	OK
+1.20D+0.50W	74.05 psi	164.32 psi	0.4506	OK
+1.20D+L+W	75.45 psi	164.32 psi	0.4592	OK
+0.90D+W	46.74 psi	164.32 psi	0.2844	OK
+0.90D	60.81 psi	164.32 psi	0.3701	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL N

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

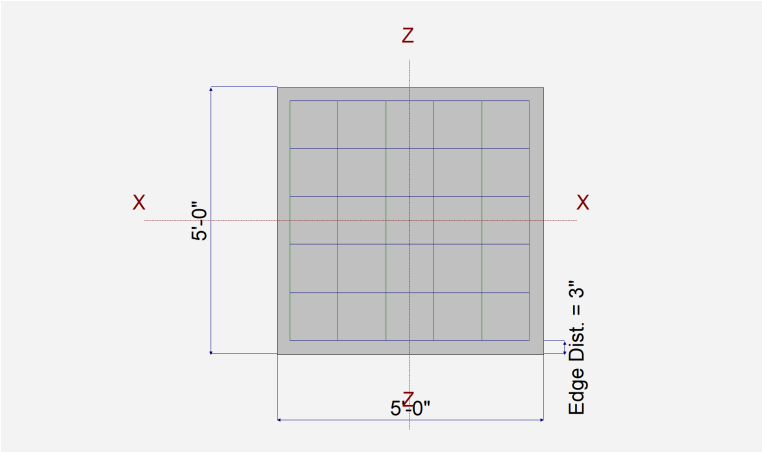
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	5.0	ft
Length parallel to Z-Z Axis	=	5.0	ft
Footing Thickness	=	16.0	in



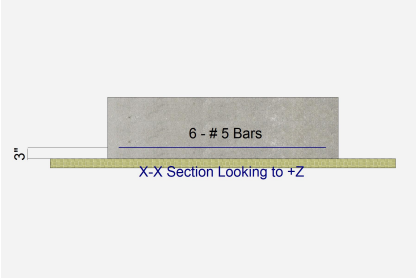
Pedestal dimensions...			
px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in
Rebar Centerline to Edge of Concrete...			
at Bottom of footing	=	3.0	in

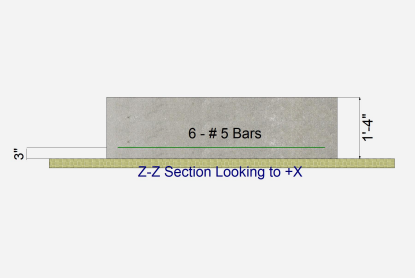
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		6
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		6
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	43.0		7.0		-1.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL N

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7310	Soil Bearing	2.193 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	47.833	Uplift	-0.60 k	28.70 k	+0.60D+0.60W
PASS	0.3711	Z Flexure (+X)	7.850 k-ft/ft	21.151 k-ft/ft	+1.20D+1.60L
PASS	0.3711	Z Flexure (-X)	7.850 k-ft/ft	21.151 k-ft/ft	+1.20D+1.60L
PASS	0.3711	X Flexure (+Z)	7.850 k-ft/ft	21.151 k-ft/ft	+1.20D+1.60L
PASS	0.3711	X Flexure (-Z)	7.850 k-ft/ft	21.151 k-ft/ft	+1.20D+1.60L
PASS	0.5135	1-way Shear (+X)	22.544 psi	43.905 psi	+1.20D+1.60L
PASS	0.5135	1-way Shear (-X)	22.544 psi	43.905 psi	+1.20D+1.60L
PASS	0.5135	1-way Shear (+Z)	22.544 psi	43.905 psi	+1.20D+1.60L
PASS	0.5135	1-way Shear (-Z)	22.544 psi	43.905 psi	+1.20D+1.60L
PASS	0.5380	2-way Punching	88.403 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	1.913	1.913	n/a	n/a	0.638
X-X, +D+L	3.0	n/a	0.0	2.193	2.193	n/a	n/a	0.731
X-X, +D+0.750L	3.0	n/a	0.0	2.123	2.123	n/a	n/a	0.708
X-X, +D+0.60W	3.0	n/a	0.0	1.889	1.889	n/a	n/a	0.630
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	2.105	2.105	n/a	n/a	0.702
X-X, +0.60D+0.60W	3.0	n/a	0.0	1.124	1.124	n/a	n/a	0.375
X-X, +0.60D	3.0	n/a	0.0	1.148	1.148	n/a	n/a	0.383
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	1.913	1.913	0.638
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.193	2.193	0.731
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.123	2.123	0.708
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	1.889	1.889	0.630
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	2.105	2.105	0.702
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	1.124	1.124	0.375
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.148	1.148	0.383

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	7.525	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.40D	7.525	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+1.60L	7.850	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+1.60L	7.850	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L	7.325	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L	7.325	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+0.50W	6.388	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+0.50W	6.388	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L+W	7.20	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +1.20D+L+W	7.20	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D+W	4.713	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL N

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	4.713	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D	4.838	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
X-X, +0.90D	4.838	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.40D	7.525	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.40D	7.525	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+1.60L	7.850	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+1.60L	7.850	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L	7.325	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L	7.325	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+0.50W	6.388	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+0.50W	6.388	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L+W	7.20	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +1.20D+L+W	7.20	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D+W	4.713	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D+W	4.713	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D	4.838	-X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK
Z-Z, +0.90D	4.838	+X	Bottom	0.3456	ACI 7.6.1.1	0.3720	21.151	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	21.61 psi	21.61 psi	21.61 psi	43.91 psi	0.49	OK
+1.20D+1.60L	22.54 psi	22.54 psi	22.54 psi	43.91 psi	0.51	OK
+1.20D+L	21.04 psi	21.04 psi	21.04 psi	43.91 psi	0.48	OK
+1.20D+0.50W	18.34 psi	18.34 psi	18.34 psi	43.91 psi	0.42	OK
+1.20D+L+W	20.68 psi	20.68 psi	20.68 psi	43.91 psi	0.47	OK
+0.90D+W	13.53 psi	13.53 psi	13.53 psi	43.91 psi	0.31	OK
+0.90D	13.89 psi	13.89 psi	13.89 psi	43.91 psi	0.32	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	21.61 psi	21.61 psi	21.61 psi	43.91 psi	0.49	OK
+1.20D+1.60L	22.54 psi	22.54 psi	22.54 psi	43.91 psi	0.51	OK
+1.20D+L	21.04 psi	21.04 psi	21.04 psi	43.91 psi	0.48	OK
+1.20D+0.50W	18.34 psi	18.34 psi	18.34 psi	43.91 psi	0.42	OK
+1.20D+L+W	20.68 psi	20.68 psi	20.68 psi	43.91 psi	0.47	OK
+0.90D+W	13.53 psi	13.53 psi	13.53 psi	43.91 psi	0.31	OK
+0.90D	13.89 psi	13.89 psi	13.89 psi	43.91 psi	0.32	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	84.74 psi	164.32 psi	0.5157	OK
+1.20D+1.60L	88.40 psi	164.32 psi	0.538	OK
+1.20D+L	82.49 psi	164.32 psi	0.502	OK
+1.20D+0.50W	71.93 psi	164.32 psi	0.4378	OK
+1.20D+L+W	81.08 psi	164.32 psi	0.4935	OK
+0.90D+W	53.07 psi	164.32 psi	0.323	OK
+0.90D	54.48 psi	164.32 psi	0.3315	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL P10

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

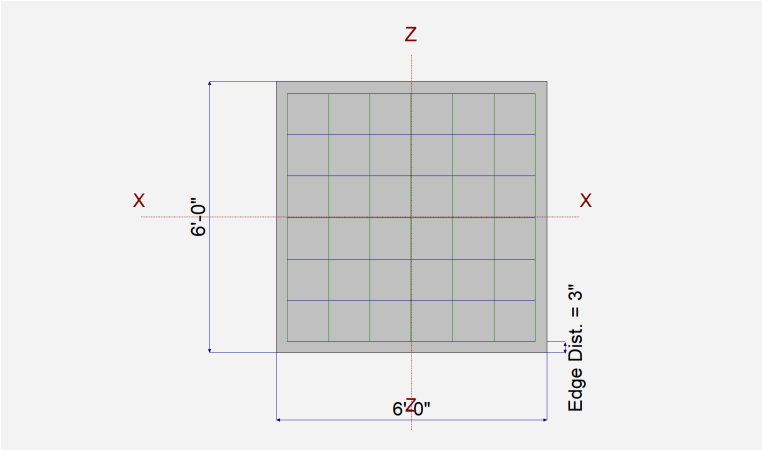
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	6.0	ft
Length parallel to Z-Z Axis	=	6.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0	in

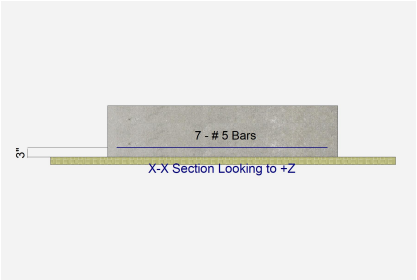
Reinforcing

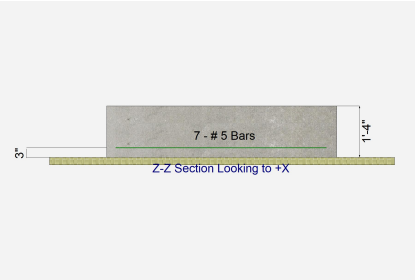
Bars parallel to X-X Axis			
Number of Bars	=		7
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		7.0
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation n/a

# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	75.0		15.0		-2.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL P10

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8977	Soil Bearing	2.693 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	40.980	Uplift	-1.20 k	49.176 k	+0.60D+0.60W
PASS	0.6924	Z Flexure (+X)	14.250 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.6924	Z Flexure (-X)	14.250 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.6924	X Flexure (+Z)	14.250 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.6924	X Flexure (-Z)	14.250 k-ft/ft	20.580 k-ft/ft	+1.20D+1.60L
PASS	0.8961	1-way Shear (+X)	38.974 psi	43.495 psi	+1.20D+1.60L
PASS	0.8961	1-way Shear (-X)	38.974 psi	43.495 psi	+1.20D+1.60L
PASS	0.8961	1-way Shear (+Z)	38.974 psi	43.495 psi	+1.20D+1.60L
PASS	0.8961	1-way Shear (-Z)	38.974 psi	43.495 psi	+1.20D+1.60L
PASS	0.9931	2-way Punching	163.175 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	2.277	2.277	n/a	n/a	0.759
X-X, +D+L	3.0	n/a	0.0	2.693	2.693	n/a	n/a	0.898
X-X, +D+0.750L	3.0	n/a	0.0	2.589	2.589	n/a	n/a	0.863
X-X, +D+0.60W	3.0	n/a	0.0	2.243	2.243	n/a	n/a	0.748
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	2.564	2.564	n/a	n/a	0.855
X-X, +0.60D+0.60W	3.0	n/a	0.0	1.333	1.333	n/a	n/a	0.444
X-X, +0.60D	3.0	n/a	0.0	1.366	1.366	n/a	n/a	0.455
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	2.277	2.277	0.759
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	2.693	2.693	0.898
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	2.589	2.589	0.863
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	2.243	2.243	0.748
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	2.564	2.564	0.855
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	1.333	1.333	0.444
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	1.366	1.366	0.455

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	13.125	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.40D	13.125	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+1.60L	14.250	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+1.60L	14.250	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L	13.125	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L	13.125	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+0.50W	11.125	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+0.50W	11.125	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L+W	12.875	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +1.20D+L+W	12.875	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D+W	8.188	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK

Project Title:
Engineer:
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General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL P10

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	8.188	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D	8.438	+Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
X-X, +0.90D	8.438	-Z	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.40D	13.125	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.40D	13.125	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+1.60L	14.250	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+1.60L	14.250	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+L	13.125	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+L	13.125	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+0.50W	11.125	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+0.50W	11.125	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+L+W	12.875	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +1.20D+L+W	12.875	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +0.90D+W	8.188	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +0.90D+W	8.188	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +0.90D	8.438	-X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK
Z-Z, +0.90D	8.438	+X	Bottom	0.3456	ACI 7.6.1.1	0.3617	20.580	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	35.90 psi	35.90 psi	35.90 psi	43.50 psi	0.83	OK
+1.20D+1.60L	38.97 psi	38.97 psi	38.97 psi	43.50 psi	0.90	OK
+1.20D+L	35.90 psi	35.90 psi	35.90 psi	43.50 psi	0.83	OK
+1.20D+0.50W	30.43 psi	30.43 psi	30.43 psi	43.50 psi	0.70	OK
+1.20D+L+W	35.21 psi	35.21 psi	35.21 psi	43.50 psi	0.81	OK
+0.90D+W	22.39 psi	22.39 psi	22.39 psi	43.50 psi	0.51	OK
+0.90D	23.08 psi	23.08 psi	23.08 psi	43.50 psi	0.53	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	35.90 psi	35.90 psi	35.90 psi	43.50 psi	0.83	OK
+1.20D+1.60L	38.97 psi	38.97 psi	38.97 psi	43.50 psi	0.90	OK
+1.20D+L	35.90 psi	35.90 psi	35.90 psi	43.50 psi	0.83	OK
+1.20D+0.50W	30.43 psi	30.43 psi	30.43 psi	43.50 psi	0.70	OK
+1.20D+L+W	35.21 psi	35.21 psi	35.21 psi	43.50 psi	0.81	OK
+0.90D+W	22.39 psi	22.39 psi	22.39 psi	43.50 psi	0.51	OK
+0.90D	23.08 psi	23.08 psi	23.08 psi	43.50 psi	0.53	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	150.29 psi	164.32 psi	0.9147	OK
+1.20D+1.60L	163.18 psi	164.32 psi	0.9931	OK
+1.20D+L	150.29 psi	164.32 psi	0.9147	OK
+1.20D+0.50W	127.39 psi	164.32 psi	0.7753	OK
+1.20D+L+W	147.43 psi	164.32 psi	0.8972	OK
+0.90D+W	93.75 psi	164.32 psi	0.5706	OK
+0.90D	96.62 psi	164.32 psi	0.588	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL Q 1

Code References

Calculations per ACI 318-19, IBC 2021, SDPWS 2021
Load Combinations Used : ASCE 7-16

General Information

Material Properties

f'c : Concrete 28 day strength	=	3.0	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	Yes
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	3.0	ksf
Soil Density	=	110.0	pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

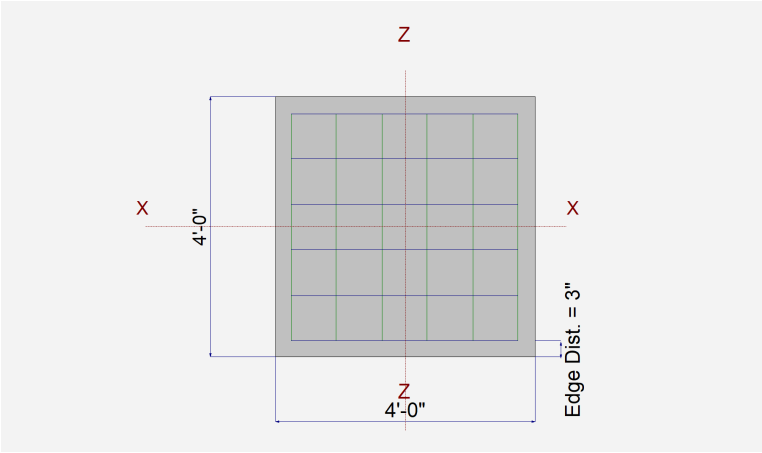
Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

Width parallel to X-X Axis	=	4.0	ft
Length parallel to Z-Z Axis	=	4.0	ft
Footing Thickness	=	16.0	in



Pedestal dimensions...

px : parallel to X-X Axis	=		in
pz : parallel to Z-Z Axis	=		in
Height	=		in

Rebar Centerline to Edge of Concrete...

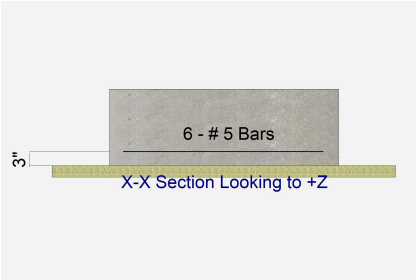
at Bottom of footing	=	3.0	in

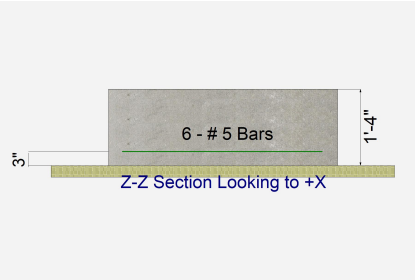
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		6.0
Reinforcing Bar Size	=	#	5
Bars parallel to Z-Z Axis			
Number of Bars	=		6.0
Reinforcing Bar Size	=	#	5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=	15.0		3.0		-7.0			k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL Q 1

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.4393	Soil Bearing	1.318 ksf	3.0 ksf	+D+L about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	2.585	Uplift	-4.20 k	10.856 k	+0.60D+0.60W
PASS	0.1086	Z Flexure (+X)	2.850 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS	0.1086	Z Flexure (-X)	2.850 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS	0.1086	X Flexure (+Z)	2.850 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS	0.1086	X Flexure (-Z)	2.850 k-ft/ft	26.249 k-ft/ft	+1.20D+1.60L
PASS	0.1777	1-way Shear (+X)	8.404 psi	47.296 psi	+1.20D+1.60L
PASS	0.1777	1-way Shear (-X)	8.404 psi	47.296 psi	+1.20D+1.60L
PASS	0.1777	1-way Shear (+Z)	8.404 psi	47.296 psi	+1.20D+1.60L
PASS	0.1777	1-way Shear (-Z)	8.404 psi	47.296 psi	+1.20D+1.60L
PASS	0.1892	2-way Punching	31.084 psi	164.317 psi	+1.20D+1.60L

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, D Only	3.0	n/a	0.0	1.131	1.131	n/a	n/a	0.377
X-X, +D+L	3.0	n/a	0.0	1.318	1.318	n/a	n/a	0.439
X-X, +D+0.750L	3.0	n/a	0.0	1.271	1.271	n/a	n/a	0.424
X-X, +D+0.60W	3.0	n/a	0.0	0.8683	0.8683	n/a	n/a	0.289
X-X, +D+0.750L+0.450W	3.0	n/a	0.0	1.075	1.075	n/a	n/a	0.358
X-X, +0.60D+0.60W	3.0	n/a	0.0	0.4160	0.4160	n/a	n/a	0.139
X-X, +0.60D	3.0	n/a	0.0	0.6785	0.6785	n/a	n/a	0.226
Z-Z, D Only	3.0	0.0	n/a	n/a	n/a	1.131	1.131	0.377
Z-Z, +D+L	3.0	0.0	n/a	n/a	n/a	1.318	1.318	0.439
Z-Z, +D+0.750L	3.0	0.0	n/a	n/a	n/a	1.271	1.271	0.424
Z-Z, +D+0.60W	3.0	0.0	n/a	n/a	n/a	0.8683	0.8683	0.289
Z-Z, +D+0.750L+0.450W	3.0	0.0	n/a	n/a	n/a	1.075	1.075	0.358
Z-Z, +0.60D+0.60W	3.0	0.0	n/a	n/a	n/a	0.4160	0.4160	0.139
Z-Z, +0.60D	3.0	0.0	n/a	n/a	n/a	0.6785	0.6785	0.226

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D	2.625	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.40D	2.625	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+1.60L	2.850	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+1.60L	2.850	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+L	2.625	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+L	2.625	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+0.50W	1.813	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+0.50W	1.813	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+L+W	1.750	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +1.20D+L+W	1.750	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +0.90D+W	0.8125	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: 10840 sw 67TH AVE.ec6

LIC# : KW-06014328, Build:20.24.10.03 NESTOR PALACIOS (c) ENERCALC, LLC 1982-2025

DESCRIPTION: FOOTER @ GL Q 1

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +0.90D+W	0.8125	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +0.90D	1.688	+Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
X-X, +0.90D	1.688	-Z	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.40D	2.625	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.40D	2.625	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+1.60L	2.850	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+1.60L	2.850	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+L	2.625	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+L	2.625	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+0.50W	1.813	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+0.50W	1.813	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+L+W	1.750	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +1.20D+L+W	1.750	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +0.90D+W	0.8125	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +0.90D+W	0.8125	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +0.90D	1.688	-X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK
Z-Z, +0.90D	1.688	+X	Bottom	0.3456	ACI 7.6.1.1	0.4650	26.249	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.74 psi	7.74 psi	7.74 psi	47.30 psi	0.16	OK
+1.20D+1.60L	8.40 psi	8.40 psi	8.40 psi	47.30 psi	0.18	OK
+1.20D+L	7.74 psi	7.74 psi	7.74 psi	47.30 psi	0.16	OK
+1.20D+0.50W	5.35 psi	5.35 psi	5.35 psi	47.30 psi	0.11	OK
+1.20D+L+W	5.16 psi	5.16 psi	5.16 psi	47.30 psi	0.11	OK
+0.90D+W	2.40 psi	2.40 psi	2.40 psi	47.30 psi	0.05	OK
+0.90D	4.98 psi	4.98 psi	4.98 psi	47.30 psi	0.11	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	7.74 psi	7.74 psi	7.74 psi	47.30 psi	0.16	OK
+1.20D+1.60L	8.40 psi	8.40 psi	8.40 psi	47.30 psi	0.18	OK
+1.20D+L	7.74 psi	7.74 psi	7.74 psi	47.30 psi	0.16	OK
+1.20D+0.50W	5.35 psi	5.35 psi	5.35 psi	47.30 psi	0.11	OK
+1.20D+L+W	5.16 psi	5.16 psi	5.16 psi	47.30 psi	0.11	OK
+0.90D+W	2.40 psi	2.40 psi	2.40 psi	47.30 psi	0.05	OK
+0.90D	4.98 psi	4.98 psi	4.98 psi	47.30 psi	0.11	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	28.63 psi	164.32 psi	0.1742	OK
+1.20D+1.60L	31.08 psi	164.32 psi	0.1892	OK
+1.20D+L	28.63 psi	164.32 psi	0.1742	OK
+1.20D+0.50W	19.77 psi	164.32 psi	0.1203	OK
+1.20D+L+W	19.09 psi	164.32 psi	0.1162	OK
+0.90D+W	8.86 psi	164.32 psi	0.05393	OK
+0.90D	18.41 psi	164.32 psi	0.112	OK

PALACIOS
ENGINEERING LLC

Geotechnical Report

17323 SW 47th Ct. Miramar FL 33029 (954)-558-1505 nestor@palaciosengineering.com

ATM Engineering

TESTING LABORATORIES - ENGINEERING INSPECTION SERVICES - DRILLING - ENVIRONMENTAL SERVICES.

Aubrey Engineering, LLC d/b/a ATM Engineering

1950 W 84th Street, Hialeah, FL 33014 Phone:. 305-646-1888 Fax: 305-646-1887

January 17, 2025

MIK Architecture, LLC
1385 Coral Way, Ste 202
Miami, FL 33140

RE: Subsurface Investigation for Proposed Two-Story Single-Family Residence & Swimming Pool
Located at: 10840 SW 67th Ave, Miami, FL

Dear Sir.:

Pursuant to your authorization, **ATM ENGINEERING** conducted a subsurface investigation at the above referenced project. The investigation was performed on **January 15, 2025.**

The purpose of the investigation was to develop preliminary information about the site and the subsurface conditions existing in the vicinity of the proposed construction.

To achieve the desired objective **two (2) standard penetration test borings and three (3) percolation test borings were performed** and the logs are enclosed in this report.

TEST METHOD:

The borings were conducted in accordance with the procedures outlined for the standard penetration test and split spoon sampling of soils by ASTM Method D-1586.

A two (2) foot long two (2) inches O.D. Split Spoon Sampler was driven into the ground by successive blows with 140 lbs. The hammer drops thirty (30) inches. The soil sampler was driven two (2) feet at a time, then extracted for visual examination and classification of the retained soil samples.

The number of blows required for a one (1) foot penetration of the sampler is designated as "N" (known as the standard penetration resistance value). The "N" value provides an indication of the relative density of non-cohesive soils and the consistency of cohesive soils.

Suitable corrections are applied to this number in order to include the effects of soil overburden pressure and other factors. A general evaluation of soils is made from the established correlation between "N" and the relative density or consistency of soils.

This dynamic method of soil testing has been widely accepted by foundation engineers and architects to conservatively evaluate the bearing capacity of soils. A continuous drilling and sampling procedure was used therefore, the samples were taken at intervals of two (2) feet or at every change in soil characteristics.

Aubrey Engineering, LLC d/b/a ATM Engineering

1950 W 84th Street, Hialeah, FL 33014 Phone:. 305-646-1888 Fax: 305-646-1887

The types of foundation material encountered have been visually classified and are described in detail in the boring logs. The results of the field penetration tests are presented in the boring logs in numerical forms. The average ground water level at the site was found at **six (6) feet, zero (0) inches** below the existing surface (see logs). Fluctuation in the observed ground water level should be expected due to seasonal climatic changes, rainfall variation, surface water run-off and other specific factors related to the site in question.

FOUNDATION RECOMMENDATIONS FOR PROPOSED TWO-STORY SINGLE-FAMILY RESIDENCE:

Our recommendations are based on the information provided from the client as to the type of structure planned and on our subsurface investigation performed on the proposed site. Our recommendations are as follows:

1. Excavate entire building area plus 5'-0" outside the perimeter of construction and remove all top soil and unsuitable subsurface material to the necessary depth. We can anticipate the excavated depth to be **2'-0".** However, the clean soil can be used as backfill.

2. Compact excavated area to a minimum compaction of 98% of the optimum dry density as per AASHTO T-180. Verify densification procedures by taking an adequate number of field density compaction tests. The excavated area should be inspected prior to the commencement of the backfilling operation to ensure that all the unsuitable material has been removed.

3. Backfill building area, plus 5'-0" outside the perimeter of the structure to the required elevation with a clean mixture of sand and lime rock fill (or approved fill material) in compacted layers not to exceed twelve (12) inches in thickness. Compact each layer to a minimum of 98% of the optimum dry density as per AASHTO T180. Verify densification procedures by taking an adequate number of field density tests, especially by the footing area.

4. Excavate footing trenches to the required depth from the ground elevation.

5. Compact the bottom of the footing trench to a minimum compaction of 98% of the optimum dry density as per AASHTO T-180. Verify densification procedures by taking an adequate number of field density compaction tests.

DESIGN RECOMMENDATIONS:

The above foundation recommendation having been achieved and verified, we anticipate that the foundation and footings may be appropriately proportioned for a safe soil bearing capacity not to exceed **(3000)** pounds per square foot. The use of spread footings and single column pads is suggested. A monolithic slab foundation may also be adopted.

Aubrey Engineering, LLC d/b/a ATM Engineering

1950 W 84th Street, Hialeah, FL 33014 Phone:. 305-646-1888 Fax: 305-646-1887

January 17, 2025
MIK Architecture, LLC

RECOMMENDATIONS FOR SWIMMING POOL:

Our recommendations are based on the information as provided from the client as to the type of structure planned and on our subsurface investigation performed on the proposed site. Our recommendations are as follows:

1. Excavate entire swimming pool area and remove all top soil, unsuitable surface material and existing subsurface soil material to the required bottom of pool elevation. We anticipate an average excavation depth of approximately **six (6) feet, zero (0) inches**.
2. Compact excavated area to a minimum compaction of 98% of the optimum dry density as per AASHTO T-180. Verify densification procedures by taking an adequate number of field density compaction tests.
3. Care should be taken prior to any excavation work to protect adjoining foundation. It is imperative that our engineer should be retained to monitor excavation operation.

DESIGN RECOMMENDATIONS:

The above foundation recommendation having been achieved and verified, we anticipate that the foundation and footings for the swimming pool may be appropriately proportioned for a safe soil bearing capacity not to exceed **(2500)** pounds per square foot.

CONCLUSION:

Regardless of the thoroughness of our Geotechnical exploration there is always a possibility that conditions on the subject property (site) may be different from those at the test locations. Therefore, should any subsoil condition different from those reported in our boring logs be encountered during construction, **ATM ENGINEERING,** should be notified immediately.

This report was prepared exclusively for the use of **MIK Architecture, LLC.** The conclusions provided by **ATM ENGINEERING** are based solely on the information presented in this report. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

We appreciate the opportunity to have been of service to your company. Please feel free to contact us if there are any questions or comments pertaining to this report.

Sincerely yours,

WASEEM QUADRI
LICENSE
No. 51481
STATE OF FLORIDA
PROFESSIONAL ENGINEER

1-17-2025

Waseem Quadri, P.E. #51481 & STA#164
Special Inspector - Threshold Buildings
ATM Engineering

Robert Shank
President

RS/jt;MIKArchitecture,LLC

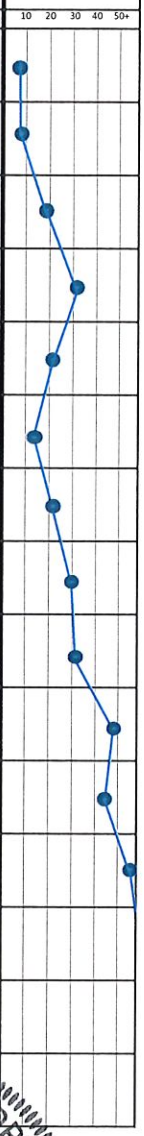
ATM Engineering

Testing Laboratories - Engineering Inspection Services - Chemist - Drilling - Environmental Services
Aubrey Engineering, LLC d/b/a ATM Engineering
1950 West 84th Street, Hialeah, Florida 33014/Phone: 305-646-1888/Fax: 305-646-1887

SOIL BORING LOG

CLIENT	MIK Architecture, LLC	**Order No**	25-0115
ADDRESS	1385 Coral Way, Ste 202, Miami, FL 33140	**Report No.**	1
PROJECT	Proposed Two-Story Single-Family Residence & Swimming Pool	**Boring No.**	B-1
ADDRESS	10840 SW 67th Ave, Miami, FL	**Date**	1/15/2025
LOCATION	As Marked on Sketch of Boundary Survey	**Driller/Helper**	AG/MP

Depth (feet)	DESCRIPTION OF MATERIALS	Sample No.	Hammer blows on sampler		"N"
	Soil Boring from 0' to 30'				
1	0'-0" to 0'-2" Top soil	0'-2'	2	3	7
2	0'-2" to 2'-6" Backfill - brown sand with some rocks		4	3	
3		2'-4'	3	3	7
4			4	5	
5	2'-6" to 6'-0" Tan medium silica sand with some rocks	4'-6'	6	8	19
6	▼		11	13	
7		6'-8'	15	16	33
8			17	13	
9		8'-10'	12	11	21
10			10	10	
11	6'-0" to 14'-6" Tan medium lime sand with coral rocks	10'-12'	9	8	15
12			7	9	
13		12'-14'	11	10	22
14			12	13	
15		14'-16'	15	16	30
16			14	17	
17		16'-18'	18	16	31
18			15	19	
19		18'-20'	17	16	37
20			21	23	
21		20'-22'	22	21	45
22	14'-6" to 30'-0" Tan limerock		24	26	
23		22'-24'	24	28	59
24			31	36	
25		24'-26'	30	29	61
26			32	36	
27		26'-28'	34	40	83
28			43	41	
29		28'-30'	40	48	91
30	**End of boring @ 30'-0"**		45	43	



Water Level: (▼) 6'-0"
Sample Type: Split Spoon (SS)
At Date: 1/15/2025

Respectfully submitted,

1-19-2025

Waseem Quadri, P.E. #51481 & S.I. #1154
Threshold Building - Special Inspector

WASEEM QUADRI
LICENSE
No. 51481
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Robert Shank, President

As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publications of statements, conclusions or extract from or regarding our reports is reserved pending our written approval.

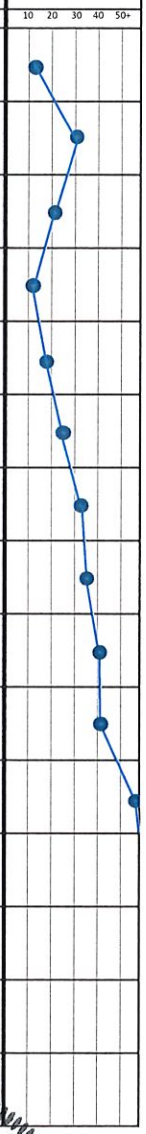
ATM Engineering

Testing Laboratories - Engineering Inspection Services - Chemist - Drilling - Environmental Services
Aubrey Engineering, LLC d/b/a ATM Engineering
1950 West 84th Street, Hialeah, Florida 33014/Phone: 305-646-1888/Fax: 305-646-1887

SOIL BORING LOG

CLIENT	MIK Architecture, LLC	**Order No**	25-0115
ADDRESS	1385 Coral Way, Ste 202, Miami, FL 33140	**Report No.**	1
PROJECT	Proposed Two-Story Single-Family Residence & Swimming Pool	**Boring No.**	B-2
ADDRESS	10840 SW 67th Ave, Miami, FL	**Date**	1/15/2025
LOCATION	As Marked on Sketch of Boundary Survey	**Driller/Helper**	AG/MP

Depth (feet)	DESCRIPTION OF MATERIALS	Sample No.	Hammer blows on sampler		"N"
	Soil Boring from 0' to 30'				
1	0'-0" to 0'-2" Top soil	0'-2'	4	6	14
2	0'-2" to 1'-0" Backfill - brown sand with rocks		8	11	
3		2'-4'	13	15	31
4	1'-0" to 14'-6" Tan medium lime sand and limerock		16	17	
5		4'-6'	12	13	23
6	▼		10	9	
7		6'-8'	8	7	13
8			6	6	
9		8'-10'	8	9	18
10			9	11	
11		10'-12'	10	13	25
12			12	12	
13		12'-14'	11	16	33
14			17	16	
15		14'-16'	18	17	36
16	14'-6" to 30'-0" Tan limerock		19	16	
17		16'-18'	15	21	41
18			20	19	
19		18'-20'	23	22	43
20			21	25	
21		20'-22'	26	28	59
22			31	30	
23		22'-24'	29	36	70
24			34	32	
25		24'-26'	35	36	70
26			34	40	
27		26'-28'	43	41	86
28			45	46	
29		28'-30'	48	43	
30	**End of boring @ 30'-0"**		49	43	



Water Level: (▼) 6'-0"
Sample Type: Split Spoon (SS)
At Date: 1/15/2025

Respectfully submitted:

Waseem Quadri, P.E. #51481 & S.I. #1154
Threshold Building - Special Inspector

WASEEM QUADRI LICENSE No. 51481 STATE OF FLORIDA PROFESSIONAL ENGINEER

Robert Shank, President

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PERCOLATION TEST
USUAL OPEN HOLE TEST (CONSTANT HEAD)

CLIENT:	MIK Architecture, LLC	Date: 1/15/2025	
CLIENT ADDRESS:	1385 Coral Way, Ste 202		
	Miami, FL 33140	TEST #:	P-1
PROJECT NAME:	Proposed Two-Story Single-Family Resdience & Swimming Pool		
PROJECT ADDRESS:	10840 SW 67th Ave, Miami, FL		

LOCATION OF TEST	As Marked on Sketch of Boundary Survey		
DIAMETER OF HOLE (IN)	6	LAT:	LON:
DEPTH HOLE (FEET)	5		
WATER TABLE BELOW GROUND SURFACE:	6 ft	- in	

No.	Elapse Time (minute)	GPM
1	1	1.0
2	1	1.0
3	1	1.0
4	1	1.0
5	1	1.0
6	1	1.0
7	1	1.0
8	1	1.0
9	1	1.0
10	1	1.0

PERCOLATION RATE :	1.0
K-VALUE:	1.113E-04

SOIL DEPTH	SOIL DESCRIPTION
0'-0" to 0'-2"	Top Soil
0'-2" to 4'-0"	Tan medium sand with rocks
4'-0" to 5'-0"	White lime sand with rocks

FIELD TECH.	AG/MP
TYPE BY:	jt

Robert Shank, President

WASEEM QUADRI LICENSE No. 51481 STATE OF FLORIDA PROFESSIONAL ENGINEER

1-22-2025

Waseem Quadri, P.E. #51481
Special Inspector (Threshold Bldg.) #1154
ATM Engineering

ATM Engineering

Testing Laboratories - Engineering Inspection Services - Chemist - Drilling - Environmental Services
Aubrey Engineering, LLC d/b/a ATM Engineering
1950 W 84th Street, Hialeah, Florida 33014 - Phone: 305-646-1888/Fax: 305-646-1887

PERCOLATION TEST
USUAL OPEN HOLE TEST (CONSTANT HEAD)

CLIENT:	MIK Architecture, LLC	Date: 1/15/2025	
CLIENT ADDRESS:	1385 Coral Way, Ste 202		
	Miami, FL 33140	TEST #:	P-2
PROJECT NAME:	Proposed Two-Story Single-Family Resdience & Swimming Pool		
PROJECT ADDRESS:	10840 SW 67th Ave, Miami, FL		

LOCATION OF TEST	As Marked on Sketch of Boundary Survey		
DIAMETER OF HOLE (IN)	6	LAT:	LON:
DEPTH HOLE (FEET)	10		
WATER TABLE BELOW GROUND SURFACE:	6 ft	- in	

No.	Elapse Time (minute)	GPM
1	1	6.0
2	1	6.0
3	1	6.0
4	1	6.0
5	1	5.0
6	1	5.0
7	1	5.0
8	1	5.0
9	1	4.0
10	1	4.0

PERCOLATION RATE :	**5.2**
K-VALUE:	**1.726E-04**

SOIL DEPTH	SOIL DESCRIPTION
0'-0" to 0'-2"	Top Soil
0'-2" to 4'-0"	Tan medium sand with rocks
4'-0" to 10'-0"	White lime sand with rocks

FIELD TECH.	AG/MP
TYPE BY:	jt

Robert Shank, President

WASEEM QUADRI
LICENSE
No. 51481
STATE OF FLORIDA
PROFESSIONAL ENGINEER

1-17-25

Waseem Quadri, P.E. #51481
Special Inspector (Threshold Bldg.) #1154
ATM Engineering

ATM Engineering

Testing Laboratories - Engineering Inspection Services - Chemist - Drilling - Environmental Services
Aubrey Engineering, LLC d/b/a ATM Engineering
1950 W 84th Street, Hialeah, Florida 33014 - Phone: 305-646-1888/Fax: 305-646-1887

PERCOLATION TEST
USUAL OPEN HOLE TEST (CONSTANT HEAD)

CLIENT:	MIK Architecture, LLC	Date: 1/15/2025	
CLIENT ADDRESS:	1385 Coral Way, Ste 202		
	Miami, FL 33140	TEST #:	P-3
PROJECT NAME:	Proposed Two-Story Single-Family Resdience & Swimming Pool		
PROJECT ADDRESS:	10840 SW 67th Ave, Miami, FL		

LOCATION OF TEST	As Marked on Sketch of Boundary Survey		
DIAMETER OF HOLE (IN)	6	LAT:	LON:
DEPTH HOLE (FEET)	15		
WATER TABLE BELOW GROUND SURFACE:	6 ft	- in	

No.	Elapse Time (minute)	GPM
1	1	11.0
2	1	11.0
3	1	11.0
4	1	11.0
5	1	10.0
6	1	10.0
7	1	9.0
8	1	9.0
9	1	8.0
10	1	7.0

PERCOLATION RATE :	**9.7**
K-VALUE:	**1.892E-04**

SOIL DEPTH	SOIL DESCRIPTION
0'-0" to 0'-2"	Top Soil
0'-2" to 4'-0"	Tan medium sand with rocks
4'-0" to 15'-0"	White lime sand with rocks

FIELD TECH.	AG/MP
TYPE BY:	jt

Robert Shank, President

Waseem Quadri, P.E. #51481
Special Inspector (Threshold Bldg.) #1154
ATM Engineering

WASEEM QUADRI
LICENSE
No. 51481
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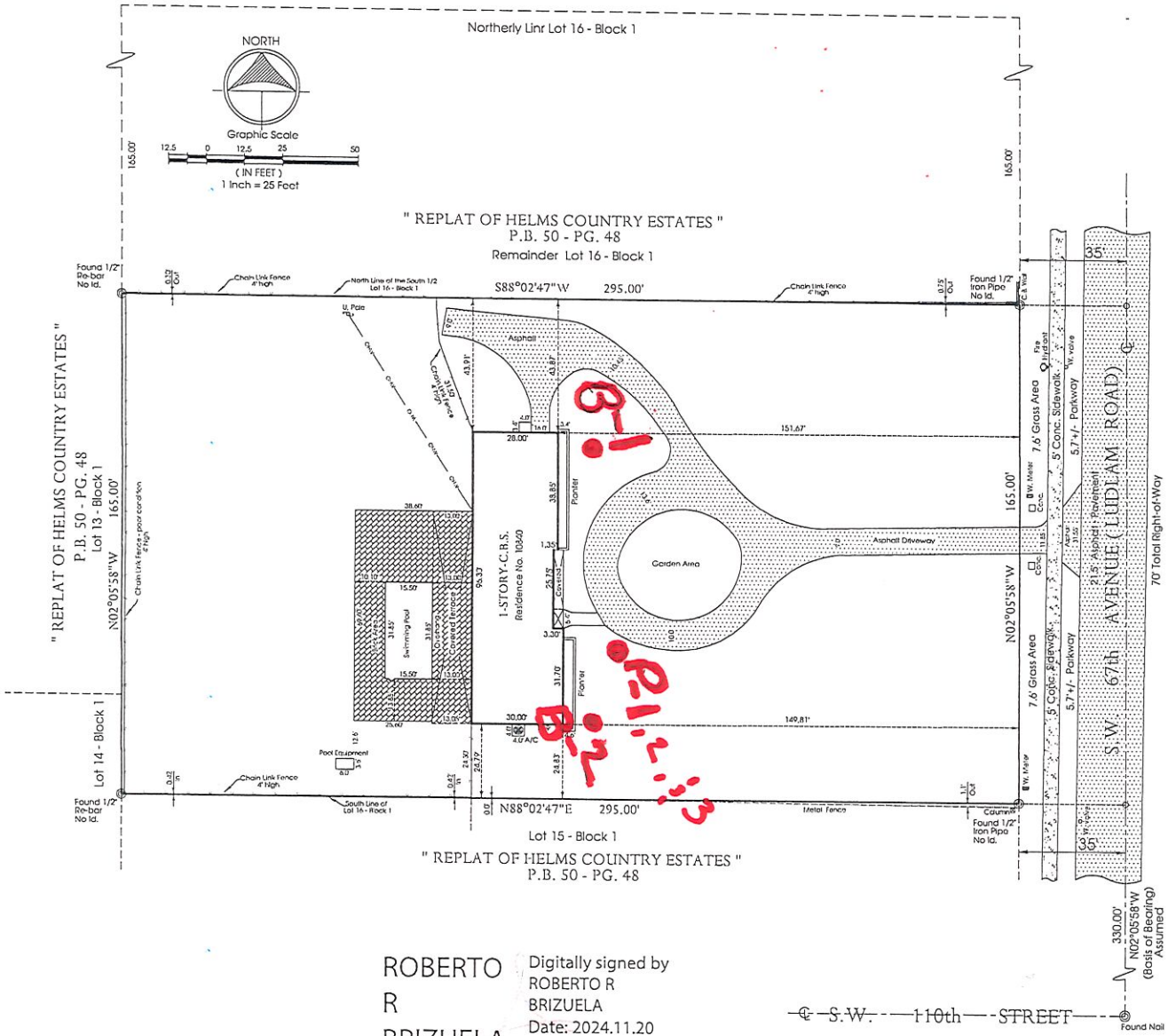

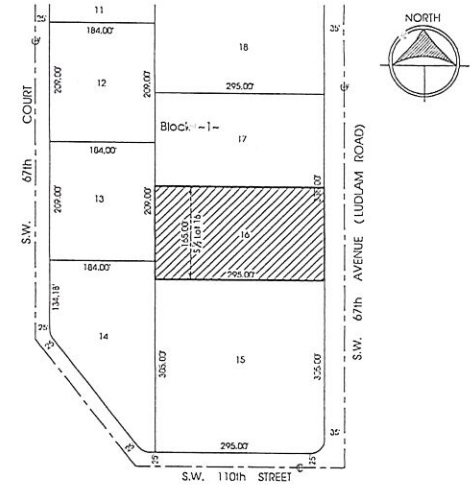

LOCATION MAP

Scale: 1" = 150'

LEGAL DESCRIPTION:

FOLIO #: 20-5011-005-0161
THE SOUTH 1/2, OF LOT 16, BLOCK 1, " REPLAT OF HELMS COUNTRY ESTATES ", ACCORDING TO THE PLAT THEREOF, RECORDED IN PLAT BOOK 50, AT PAGE 48, OF THE PUBLIC RECORDS, OF MIAMI-DADE COUNTY, FLORIDA.

CERTIFIED TO:

AGD CALISTONE, LLC
OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY
YELEN YELEN & SIMON, P.A.
CENTER STREET LENDING VII, SPE,
a Delaware Limited Liability Company, Isnoa/Atima

PROPERTY ADDRESS:

10840 S.W. 67th AVENUE,
PINECREST, FLORIDA 33156

FLOOD INSURANCE ZONE INFORMATION

COMMUNITY NUMBER	PANEL NUMBER	SUFFIX	DATE OF FIRM INDEX	FIRM ZONE	BASE FLOOD ELEV.
120425	0466	L	09-11-2009	AE	AE

SURVEYOR'S NOTES :

1-Examination of ABSTRACT OF TITLE will have to be made to determine recorded instruments, if any ,affecting this property.
2-Location and indentification of Utilities if any, are shown in accordance with recorded Plat.
3-Ownership is subject to OPINION OF TITLE.
4-Type of Survey. "BOUNDARY VSURVEY".
5-This survey is not Valid unless Signed and Sealed by the Surveyor of Record.
6-All Right of Ways shown are Public unless otherwise noted.
7- Lands Surveyed as described.
8- No underground Installations On Improvements Have been Located ,Except As Noted.

SOURCE ELEVATION PROVIDED BY DADE COUNTY SURVEY DEPARMENT RELATIVE TO MEAN SEA LEVEL NATIONAL GEODETIC VERTICAL DATUM OF 1929
LOCATOR INDEX: N/A BENCHMARK No: N/A ELEVATION: N/A

NOTE: THIS SURVEY HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF THE ENTITIES NAMED HEREON. THE CERTIFICATE DOES NOT EXTEND TO ANY UNNAMED PARTY.

COPYRIGHT ROBERTO BRIZUELA & ASSOCIATES,INC.

ROBERTO R BRIZUELA

Digitally signed by ROBERTO R BRIZUELA
Date: 2024.11.20 09:23:14 -08'00'

CERTIFICATION:

I HEREBY CERTIFY: THAT THE ATTACHED " SKETCH OF SURVEY " OF THE ABOVE DESCRIBED PROPERTY IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AS RECENTLY SURVEYED UNDER MY DIRECTION AND THAT THERE ARE NO ENCROACHMENTS OTHER THAN THOSE SHOWN, AND MEETS THE INTENT OF THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 61G-17.051 OF FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027 OF FLORIDA STATUTES.

SIGNED: _____
BY: ROBERTO R. BRIZUELA
PROFESSIONAL LAND SURVEYOR and MAPPER

FOR THE FIRM
P.S.M. No. 3064-STATE OF FLORIDA

" L E G E N D "

P.R.M. -PERMANENT REFERENCE MONUMENT	U.E. -UTILITY EASEMENT
P.C.P. -PERMANENT CONTROL POINT	W.F. -WOOD FENCE
F.I.P. -FOUND IRON PIPE	M -MEASURE
S.I.P. -SET IRON PIPE 1/2" STAMPED	R -RECORD
F.D.H. -FOUND DRILL HOLE	S.N.D. -SET NAIL & DISC STAMPED P.L.S.
S.D.H. -SET DRILL HOLE	F.N.D. -FOUND NAIL & DISC
S.D.H. -SET DRILL HOLE	C.B.S. -CONCRETE BLOCK STRUCTURE
C/L -CENTER LINE	ENC. -ENCROACHMENT
RES -RESIDENCE	CL -CLEAR
L.F.E. -LOWEST FLOOR ELEVATION	R/W -RIGHT OF WAY
L.F.E. -FINISH FLOOR ELEVATION	C.L.F. -CHAIN LINK FENCE

THIS SURVEY IS NOT VALID UNLESS SIGNED AND SEALED BY THE SURVEYOR OF RECORD

SKETCH OF " BOUNDARY SURVEY "

Scale: 1" = 25'

ROBERTO R. BRIZUELA & ASSOCIATES
PROFESSIONAL SURVEYOR AND MAPPER
7315 WEST FLAGLER STREET, MIAMI, FLORIDA 33144
FAX: (305) 551 - 4393

BOUNDARY SURVEY

Field Book Files: Data colector 11/16/2024	Field Work Date: 11/16/2024	Revision 1: 11/20/2024	Job No. 24- 11 - 113