

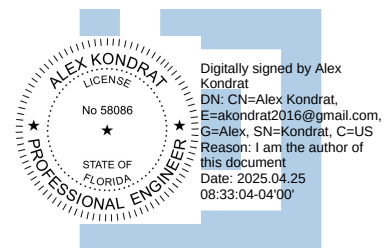
RATIONAL ANALYSIS

PROJECT
MILO RESIDENCE
11901 SW 63RD AVE
PINECREST, FLORIDA 33156

DATE 4-25-25
PAGES COVERED BY THIS SEAL 1-136



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9935 NW 29 STREET,
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MILO 7-22 REV 042125.wnd

General:

Reference Abbreviations: T: Table, F: Figure, E: Equation, S: Section

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

Building:

Roof	= Roof Type	= Hipped	Encl	= Enclosure Classification	= Enclosed
Help	= Help on Building Roof Type	= Help	Pitch	= Pitch of Roof	= 4.0 :12
θ	= Slope of Roof	= 18.435 Deg	W	= Building Width	= 55.670 ft
L	= Building Length	= 82.330 ft	R_{ht}	= Ridge Height	= 35.945 ft
E_{ht}	= Eave Height	= 26.000 ft	L_{hip}	= Ridge Hipped Length	= 40.000 ft
θ_{hip}	= Hipped End Slope of Roof	= 23.67 Deg	OH	= Overhang Configuration	= All Soffit
Par	= Parapet	= None	Z_i	= Highest Opening Elevation	= 0.0000 ft
HT_{over}	= Override Mean Roof Height	= False	Ht_{man}	= Mean Roof Height	= 30.972 ft
RA_{over}	= Override Roof Area	= False	GC_{pi_o}	= Override GC_{pi} value	= False
IsElev	= Building is Elevated	= False			

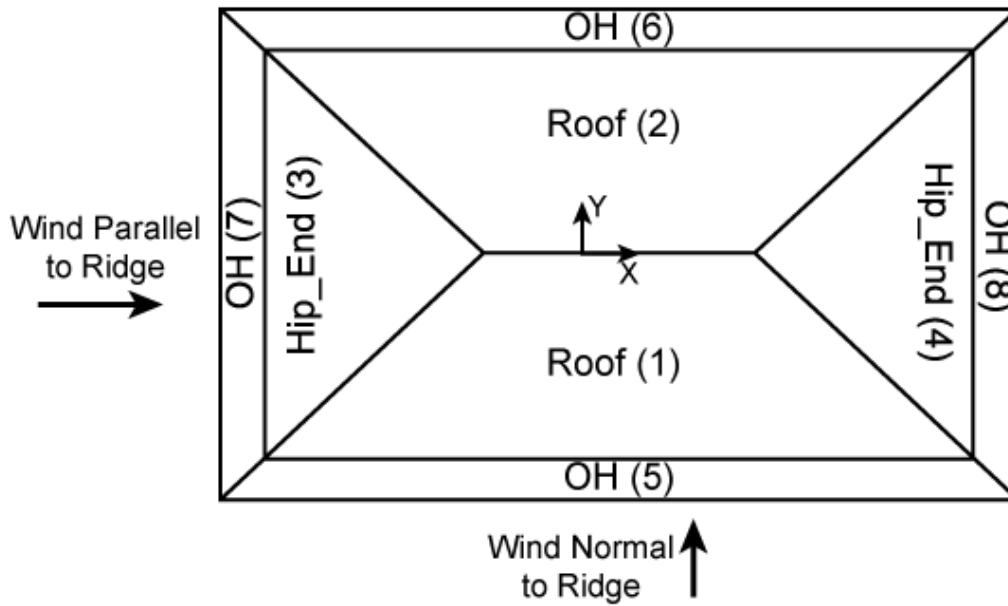
Exposure Constants [T:26.11-1]:

α = 3-s Gust-speed exponent	= 9.800	Z_g = Nominal Ht of Boundary Layer	= 2460.000 ft
$\hat{\alpha}$ = 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

Overhang Inputs:

Std	= Overhangs on all sides are the same	= True
OHType	= Type of Roof Wall Intersections	= Soffit
OH	= Overhang of Roof Beyond Wall	= 2.000 ft

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



h = Mean structure height = 30.972 ft
 K_{zt} = No Topographic Feature = 1.000
 GC_{pi} = $\pm$ Internal Press Coef $T:26.13-1$ = ± 0.18
 K_e = Ground Elev Factor $T:26.10-1$ = 1.000
 q_{in} = Negative Internal Pressure: q_h = 46.42 psf
 A_{roof} = Roof Area = 5,474.47 ft²

$K_h = 2.41 \cdot (Z/Z_g)^{2/\alpha} T:26.10-1$ = 0.987
 K_d = Directionality Factor $T:26.6-1$ = 0.85
 LF = ASD Load Factor = 0.60
 $q_h = .00256 \cdot K_h \cdot K_{zt} \cdot K_e \cdot V^2 \cdot LF E:26.10-1$ = 46.42 psf
 q_{ip} = For $+GC_{pi}$ use q_h = 46.42 psf

MWFRS Wind Loads [Normal to Ridge]

h = Mean Roof Height of Building = 30.9725 ft
 B = Building Width Normal To Wind = 82.3300 ft
 L/B = Ratio: L/B = 0.676
 θ = Slope of Main Roof = 18.43 °
 G = Gust Factor: $\min(G_1, G_2)$ = 0.850
 C_{pLW} = Leeward Wall Coefficient = -0.500

R_{ht} = Ridge Height Of Roof = 35.9450 ft
 L = Building Width Parallel To Wind = 55.6700 ft
 h/L = Ratio: h/L = 0.556
 θ_{hip} = Slope of Hipped Roof Ends = 23.67 °
 C_{pW} = Windward Wall Coefficient = 0.800
 C_{pSW} = Side Wall Coefficient = -0.700

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
26.000	+0.18	46.42	0.952	1.000	44.79	18.79	-23.87	-30.58	42.66	9.60
26.000	-0.18	46.42	0.952	1.000	44.79	32.99	-9.67	-16.38	42.66	9.60

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

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

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 Deg	Basis	GC_{pi}	C_{pMin}	C_{pMax}	P_{min} psf	P_{max} psf	P_{min} psf
Hip_End	Hipped End 0 to $h/2$	3,4	2.000	15.486	0.0	P	+0.18	-0.916	-0.18	-37.82	-13.14	4.80
Hip_End	Hipped End $h/2$ to h	3,4	15.486	30.972	0.0	P	+0.18	-0.877	-0.18	-36.53	-13.14	4.80
Hip_End	Hipped End h to $2 \cdot h$	3,4	30.972	57.670	0.0	P	+0.18	-0.523	-0.18	-24.63	-13.14	4.80
OH_Top	Overhang Top	5	All	All	18.43	N	+0.18	-0.07	-0.528	-9.46	-24.80	4.80
OH_Top	Overhang Top 0 to $h/2$	7,8	0.000	15.486	0.0	P	+0.18	-0.916	-0.18	-37.82	-13.14	4.80
OH_Top	Overhang Top $h/2$ to h	7,8	15.486	30.972	0.0	P	+0.18	-0.877	-0.18	-36.53	-13.14	4.80
OH_Top	Overhang Top h to $2 \cdot h$	7,8	30.972	59.670	0.0	P	+0.18	-0.523	-0.18	-24.63	-13.14	4.80
OH_Top	Overhang Leeward	7,8	All	All	18.43	N	+0.18	-0.572	-0.572	-26.30	-26.30	4.80

Roof_LW	Roof Leeward	2	All	All	18.43	N	+0.18	-0.572	-0.572	-26.30	-26.30	4.80
Roof_WW	Roof Windward	1	All	All	18.43	N	+0.18	-0.07	-0.528	-9.46	-24.80	4.80
Soffit	Soffit Bottom	5	All	All	0.0	N	+0.18	0.8	0.8	19.73	19.73	4.80
Hip_End	Hipped End 0 to h/2	3,4	2.000	15.486	0.0	P	-0.18	-0.916	-0.18	-23.61	1.07	4.80
Hip_End	Hipped End h/2 to h	3,4	15.486	30.972	0.0	P	-0.18	-0.877	-0.18	-22.33	1.07	4.80
Hip_End	Hipped End h to 2•h	3,4	30.972	57.670	0.0	P	-0.18	-0.523	-0.18	-10.42	1.07	4.80
OH_Top	Overhang Top	5	All	All	18.43	N	-0.18	-0.07	-0.528	4.75	-10.60	4.80
OH_Top	Overhang Top 0 to h/2	7,8	0.000	15.486	0.0	P	-0.18	-0.916	-0.18	-23.61	1.07	4.80
OH_Top	Overhang Top h/2 to h	7,8	15.486	30.972	0.0	P	-0.18	-0.877	-0.18	-22.33	1.07	4.80
OH_Top	Overhang Top h to 2•h	7,8	30.972	59.670	0.0	P	-0.18	-0.523	-0.18	-10.42	1.07	4.80
OH_Top	Overhang Leeward	7,8	All	All	18.43	N	-0.18	-0.572	-0.572	-12.09	-12.09	4.80
Roof_LW	Roof Leeward	2	All	All	18.43	N	-0.18	-0.572	-0.572	-12.09	-12.09	4.80
Roof_WW	Roof Windward	1	All	All	18.43	N	-0.18	-0.07	-0.528	4.75	-10.60	4.80
Soffit	Soffit Bottom	5	All	All	0.0	N	-0.18	0.8	0.8	33.94	33.94	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 $\S 27.1.5$ $\S 27.1.5$ = MWFRS Min Wall Pressure = 9.60 psf

+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

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 WindReduction = Reduction Factor (.8) for $h/L \geq 1$ & $10 \leq \theta \leq 15^\circ$

-Press = Pressure Acting Away from Surface

MWFRS Wind Loads [Parallel to Ridge]

h = Mean Roof Height of Building = 30.9725 ft

B = Building Width Normal To Wind = 55.6700 ft

L/B = Ratio: L/B = 1.479

 θ = Slope of Main Roof = 18.43°G = Gust Factor: Min(G_1 , G_2) = 0.850 C_{pLW} = Leeward Wall Coefficient = -0.404 R_{ht} = Ridge Height Of Roof = 35.9450 ft

L = Building Width Parallel To Wind = 82.3300 ft

h/L = Ratio: h/L = 0.376

 θ_{Hip} = Slope of Hipped Roof Ends = 23.67° C_{pWW} = Windward Wall Coefficient = 0.800 C_{pSW} = Side Wall Coefficient = -0.700

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
35.945	+0.18	46.42	1.017	1.000	47.86	20.56	-20.66	-30.58	41.22	9.60
30.972	+0.18	46.42	0.987	1.000	46.42	19.73	-20.66	-30.58	40.39	9.60
26.000	+0.18	46.42	0.952	1.000	44.79	18.79	-20.66	-30.58	39.45	9.60
35.945	-0.18	46.42	1.017	1.000	47.86	34.76	-6.46	-16.38	41.22	9.60
30.972	-0.18	46.42	0.987	1.000	46.42	33.94	-6.46	-16.38	40.39	9.60
26.000	-0.18	46.42	0.952	1.000	44.79	32.99	-6.46	-16.38	39.45	9.60

 K_z = $2.41 \cdot (Z/Z_g)^{2/a}$ GC_{pi} = +Internal Coef $T:26.13-1$ q_{ip} = For + GC_{pi} use q_h Side = $q_h \cdot K_d \cdot G \cdot C_{pSW} - q_{ip} \cdot K_d \cdot (GC_{pi+})$ E:27.3-1Windward = $q_z \cdot K_d \cdot G \cdot C_{pWW} - q_{ip} \cdot K_d \cdot (GC_{pi+})$ E:27.3-1

+Press = Pressure Acting Toward Surface

 $\S 27.1.5$ = MWFRS Min Wall Pressure = 9.60 psf K_{zt} = No Topographic Feature q_z = $.00256 \cdot K_z \cdot K_{zt} \cdot K_e \cdot V^2 \cdot LF_{E:26.10-1}$ q_{in} = Negative Internal Pressure: q_h Leeward = $q_h \cdot K_d \cdot G \cdot C_{pLW} - q_{ip} \cdot K_d \cdot (GC_{pi+})$ E:27.3-1

Total = Windward - Leeward

-Press = Pressure Acting Away from Surface

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 Deg	Basis	GC_{pi}	C_{pMin}	C_{pMax}	P_{min} psf	P_{max} psf	P_{min} psf
Hip_End	Hipped End 0 to h	3	2.000	23.165	23.67	P	+0.18	-0.9	-0.18	-37.29	-13.14	4.80
Hip_End	Hipped End $\geq 2 \cdot h$	4	63.165	84.330	23.67	P	+0.18	-0.3	-0.18	-17.17	-13.14	4.80
OH_Top	Overhang Top 0 to h	5,6,7	0.000	30.972	18.43	P	+0.18	-0.9	-0.18	-37.29	-13.14	4.80
OH_Top	Overhang Top h to $2 \cdot h$	5,6	30.972	61.945	0.0	P	+0.18	-0.5	-0.18	-23.87	-13.14	4.80
OH_Top	Overhang Top $\geq 2 \cdot h$	5,6,8	61.945	86.330	0.0	P	+0.18	-0.3	-0.18	-17.17	-13.14	4.80
Roof	Roof 0 to h	1,2	2.000	30.972	0.0	P	+0.18	-0.9	-0.18	-37.29	-13.14	4.80
Roof	Roof h to $2 \cdot h$	1,2	30.972	61.945	0.0	P	+0.18	-0.5	-0.18	-23.87	-13.14	4.80

Roof	Roof $\geq 2 \cdot h$	1,2	61.945	84.330	0.0	P	+0.18	-0.3	-0.18	-17.17	-13.14	4.80
Soffit	Soffit Bottom	7	All	All	0.0	N	+0.18	0.8	0.8	19.73	19.73	4.80
Hip_End	Hipped End 0 to h	3	2.000	23.165	23.67	P	-0.18	-0.9	-0.18	-23.08	1.07	4.80
Hip_End	Hipped End $\geq 2 \cdot h$	4	63.165	84.330	23.67	P	-0.18	-0.3	-0.18	-2.96	1.07	4.80
OH_Top	Overhang Top 0 to h	5,6,7	0.000	30.972	18.43	P	-0.18	-0.9	-0.18	-23.08	1.07	4.80
OH_Top	Overhang Top h to $2 \cdot h$	5,6	30.972	61.945	0.0	P	-0.18	-0.5	-0.18	-9.67	1.07	4.80
OH_Top	Overhang Top $\geq 2 \cdot h$	5,6,8	61.945	86.330	0.0	P	-0.18	-0.3	-0.18	-2.96	1.07	4.80
Roof	Roof 0 to h	1,2	2.000	30.972	0.0	P	-0.18	-0.9	-0.18	-23.08	1.07	4.80
Roof	Roof h to $2 \cdot h$	1,2	30.972	61.945	0.0	P	-0.18	-0.5	-0.18	-9.67	1.07	4.80
Roof	Roof $\geq 2 \cdot h$	1,2	61.945	84.330	0.0	P	-0.18	-0.3	-0.18	-2.96	1.07	4.80
Soffit	Soffit Bottom	7	All	All	0.0	N	-0.18	0.8	0.8	33.94	33.94	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 $\S 27.1.5$

$\S 27.1.5$ = 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} = $q_h \cdot K_d \cdot G \cdot C_{pMax} - q_{in} \cdot K_d \cdot GC_{piE:27.3-1}$

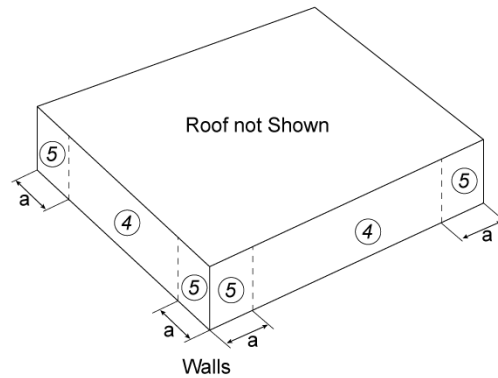
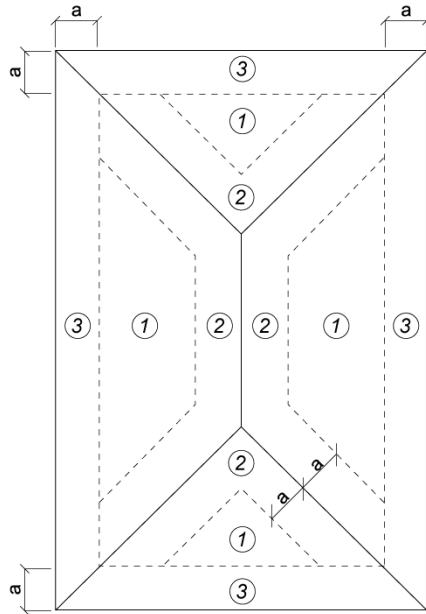
Basis = P=Parallel to Ridge: N=Normal to Ridge

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

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



h = Mean structure height = 30.972 ft
 K_{zt} = No Topographic Feature = 1.000
 GC_{pi} = $\pm$ Internal Press Coef $T:26.13-1$ = ± 0.18
 K_e = Ground Elev Factor $T:26.10-1$ = 1.000
 θ = Slope of Roof = 18.43 °
 a = Max(a_1 , 0.04 $\cdot B$, 3 ft [0.9 m]) = 5.567 ft

$K_h = 2.41 \cdot (Z/Z_g)^{2/\alpha}$ = 0.987
 K_d = Directionality Factor $T:26.6-1$ = 0.85
 LF = ASD Load Factor = 0.60
 $q_h = .00256 \cdot K_h \cdot K_{zt} \cdot K_e \cdot V^2 \cdot LF_{E:26.10-1}$ = 46.42 psf
 $a_1 = \text{Min}(0.1 \cdot B, 0.4 \cdot h)$ = 5.567 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	GC_{pi}	GC_{pd}	GC_{pu}	P_{down} psf	P_{uplift} psf
MASONRY (11.83FT)	4	1.0000	11.8300	46.65	Yes	F:30.3-1	± 0.18	0.88	-0.98	41.90	-45.85
MASONRY (11.83FT)	5	1.0000	11.8300	46.65	Yes	F:30.3-1	± 0.18	0.88	-1.16	41.90	-53.03
MASONRY (14.5FT)	4	1.0000	14.5000	70.08	Yes	F:30.3-1	± 0.18	0.85	-0.95	40.67	-44.62
MASONRY (14.5FT)	5	1.0000	14.5000	70.08	Yes	F:30.3-1	± 0.18	0.85	-1.10	40.67	-50.56

TRUSS	1	2.0000	7.0000	16.33	Yes	F:30.3-2E	±0.18	0.61	-1.64	31.36	-71.67
TRUSS	2	2.0000	7.0000	16.33	Yes	F:30.3-2E	±0.18	0.61	-2.22	31.36	-94.70
TRUSS	3	2.0000	7.0000	16.33	Yes	F:30.3-2E	±0.18	0.61	-2.40	31.36	-101.94
TRUSS	1	2.0000	23.0000	176.33	Yes	F:30.3-2E	±0.18	0.30	-0.84	18.94	-40.33
TRUSS	2	2.0000	23.0000	176.33	Yes	F:30.3-2E	±0.18	0.30	-1.35	18.94	-60.23
TRUSS	3	2.0000	23.0000	176.33	Yes	F:30.3-2E	±0.18	0.30	-1.45	18.94	-64.34
TRUSS	1	2.0000	43.5000	630.75	Yes	F:30.3-2E	±0.18	0.30	-0.80	18.94	-38.67
TRUSS	2	2.0000	43.5000	630.75	Yes	F:30.3-2E	±0.18	0.30	-1.30	18.94	-58.40
TRUSS	3	2.0000	43.5000	630.75	Yes	F:30.3-2E	±0.18	0.30	-1.40	18.94	-62.35
OPENINGS 10 SF	4	2.0000	5.0000	10.00	No	F:30.3-1	±0.18	1.00	-1.10	46.56	-50.51
OPENINGS 10 SF	5	2.0000	5.0000	10.00	No	F:30.3-1	±0.18	1.00	-1.40	46.56	-62.35
GARAGE OPENING	4	9.0000	9.0000	81.00	No	F:30.3-1	±0.18	0.84	-0.94	40.23	-44.18
GARAGE OPENING	5	9.0000	9.0000	81.00	No	F:30.3-1	±0.18	0.84	-1.08	40.23	-49.69
ROOFING 10 SF	1	2.0000	5.0000	10.00	No	F:30.3-2E	±0.18	0.70	-1.80	34.72	-78.13
ROOFING 10 SF	2	2.0000	5.0000	10.00	No	F:30.3-2E	±0.18	0.70	-2.40	34.72	-101.81
ROOFING 10 SF	3	2.0000	5.0000	10.00	No	F:30.3-2E	±0.18	0.70	-2.60	34.72	-109.70

GC_{pd} = Down (+) External Coefficient
 P_{down} = $q_h \cdot K_d \cdot [GC_{pd} - GC_{pi}]$ [E:30.3-1]
 $+Press$ = Pressure Acting Toward Surface
 $\$30.2.2$ = C&C Min Pressure = 9.60 psf
 $Width$ = Width of Component
 $Area$ = $Span \cdot Width$
 GC_{pi} = Internal Coef T:26.13-1

GC_{pu} = Uplift (-) External Coefficient
 P_{uplift} = $q_h \cdot K_d \cdot [GC_{pu} - GC_{pi}]$ [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 $Span/3$
 $Reference$ = Applicable Reference from Standard

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

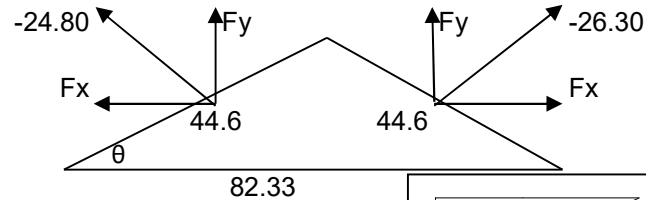
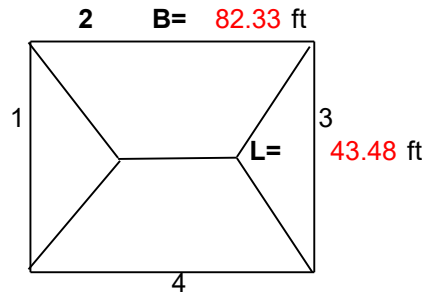
Zone	Reference	P_{max} $A \leq 10 ft^2$ psf	P_{min} $A \leq 10 ft^2$ psf	P_{max} $A = 20 ft^2$ psf	P_{min} $A = 20 ft^2$ psf	P_{max} $A = 50 ft^2$ psf	P_{min} $A = 50 ft^2$ psf
1	F:30.3-2E	34.72	-78.13	29.97	-69.00	23.69	-56.93
2	F:30.3-2E	34.72	-101.81	29.97	-91.76	23.69	-78.49
3	F:30.3-2E	34.72	-109.70	29.97	-98.74	23.69	-84.26
4	F:30.3-1	46.56	-50.51	44.47	-48.41	41.69	-45.64
5	F:30.3-1	46.56	-62.35	44.47	-58.15	41.69	-52.61
1_OHS	F:30.3-2E/F:30.3-1	9.60	-117.59	9.60	-106.36	9.60	-91.52
2_OHS	F:30.3-2E/F:30.3-1	9.60	-141.27	9.60	-129.13	9.60	-113.08
3_OHS	F:30.3-2E/F:30.3-1	9.60	-149.16	9.60	-136.10	9.60	-118.85

Zone	Reference	P_{max} $A = 100 ft^2$ psf	P_{min} $A = 100 ft^2$ psf	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
1	F:30.3-2E	18.94	-47.80	18.94	-38.67	18.94	-38.67
2	F:30.3-2E	18.94	-68.44	18.94	-58.40	18.94	-58.40
3	F:30.3-2E	18.94	-73.30	18.94	-62.35	18.94	-62.35
4	F:30.3-1	39.60	-43.54	37.50	-41.44	34.72	-38.67
5	F:30.3-1	39.60	-48.41	37.50	-44.22	34.72	-38.67
1_OHS	F:30.3-2E/F:30.3-1	9.60	-80.29	9.60	-69.07	9.60	-66.29
2_OHS	F:30.3-2E/F:30.3-1	9.60	-100.94	9.60	-88.80	9.60	-86.02
3_OHS	F:30.3-2E/F:30.3-1	9.60	-105.80	9.60	-92.74	9.60	-89.97

P_{max} = Maximum Pressure
 $Area$ = $Span \cdot Width$
 $Span$ = 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

Project: MILO
 Subject: Roof Diaphragm
 Located: Roof
 WIND LOAS PER ASCE7-22 MWFRS



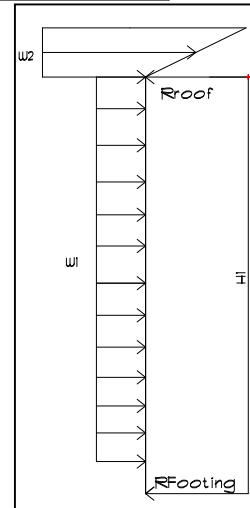
Slope $5/12$
 θ 23 degrees
 Windward Roof 24.80 psf
 Leeward Roof 26.30 psf
 Load on x component, F_x : $24.80 \times \sin \theta - 26.30 \times \sin \theta = 0.6$ psf
 $H1 = 10.00$ ft

ROOF ASSEMBLY: Prefabricated wood trusses spaced at 2'-0" c/c

DESIGN ROOF DIAPHRAGM

5/8" Exterior grade plywood sheathing laid w/face grain per perpendicular to supports.
 attached to wood roof trusses w/8d ring shank nails @ 6" at end and interior support
 and 8d RS nails at 6" c/c at perimeter and ridges

Shear capacity without blockir 335 plf (From SDPWS 2015, TABLE 4-2C)



Direction of Wind 1/3	Windward Wall	=	18.79	+	Leeward Wall	=	23.87	=	W1 =	42.66	psf	
	W=		42.66	X	5.00	+	0.58	X	89.19	=	264.8	plf
	Roof =		264.8	X	43.48	/	2	=	5.76	kips		
	Shear(2/4) Vt	=	5.76	/	82.33	=	69.91	plf				
Required Roof length to be blocked (2/4) = N/A ft (L/2-L Va / (2 VT))From each end												
Direction of Wind 2/4	Windward Wall	=	18.79	+	Leeward Wall	=	23.87	=	W1 =	42.66	psf	
	W=		42.66	X	5.00	+	0.58	X	43.48	=	238.4	plf
	Roof =		238.4	X	82.33	/	2	=	9.81	kips		
	Shear(1/3) Vt	=	9.81	/	43.48	=	225.7	plf				
Required Roof length to be blocked (1/3) = N/A ft (B/2-B Va / (2 VT))From each end												

F:\Projects 062821\TONY SOSA\MILO RESIDENCE\CALCS\ROOF DIAPHRAGM\HIGH ROOF\Roof Diaphragm Analysis HIGH ROOF AREA 5.xlsx]one story

Calculations for Reactions of Roof Trusses Uplift & Gravity

JACK TRUSSES 7'-0" SPAN

Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	61.67	PSF
	Zone 2	84.7	PSF
	Zone 3	91.94	PSF
	Zone OH	139.16	PSF
Roof Gravity Loads SLOPE > 2:12	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.57	Ft	Horizontal truss span
Slope	4	:12	
Truss Span	7.00	Ft	
Over hang	2.00	Ft	
Truss spacing	2.00	Ft	

RESULTS		
Truss angle (theta)	18.43	DEG
Truss height	1.17	Ft
Truss Length	7.38	Ft
Average uplift pressure	73.19	PSF
Reactions Uplift each end	1097	LB
Reactions Gravity each end	512	LB

Tan-1(slope)
Slope x Truss span/2
Square Rt $((\text{Truss span}/2)^2 \times (\text{Truss height}^2)) \times 2$
 $(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
 $(\text{ZOH} \times \text{OH} \times \text{Truss Spacing}) + (\text{Average pressure} \times (\text{Truss Length}/2) \times \text{Truss spacing})$
 $(\text{Total D+L} \times \text{OH} \times \text{Truss Spacing}) + (\text{Total D+L} \times (\text{Truss Length}/2) \times \text{Truss spacing})$

NU-VUE NVHTA16 (CONNECTOR #1)

ALLOWABLE UPLIFT = 2649 LBS
PARALLEL W/ WALL = 1575 LBS
PERPENDICULAR TO WALL = 2175 LBS

CHECK COMBINED LOADING

FROM DIAPHRAGM SHEAR CALCULATIONS

VL1 = 226 LBS/FT 452 LBS (SHEAR LOAD x TRUSS SPACING)
VL2 = OUT OF PLANE WALL SUCTION= WALL PRESSURE (PSF) x WALL HEIGHT/2 (FT) x 2'-0" (JOIST SPACING)

VL2 =	23.87	10	238.7 LBS	
		(FT)		
<u>UPLIFT</u>	<u>VL1</u>	<u>VL2</u>	<u>≤ 1.0</u>	UNITY EQUATION
ALLOW UPLIFT	L1	L2		
(+)	(+)	(+)	0	
0.41	0.29	0.11	0.81	OK

Calculations for Reactions of Roof Trusses Uplift & Gravity

TRUSSES 15'-6" SPAN (terrace)

Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	30.33	PSF
	Zone 2	50.23	PSF
	Zone 3	54.34	PSF
	Zone OH	139.16	PSF
Roof Gravity Loads SLOPE > 2:12	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.57	Ft	Horizontal truss span
Slope	3	:12	
Truss Span	15.50	Ft	
Over hang	2.00	Ft	
Truss spacing	2.00	Ft	

RESULTS			
Truss angle (theta)	14.04	DEG	Tan-1(slope)
Truss height	1.94	Ft	Slope x Truss span/2
Truss Length	15.98	Ft	Square Rt ((Truss span/2)**2 x (Truss height**2)) x 2
Average uplift pressure	40.28	PSF	(Pressure Zone 1 + Pressure Zone 2)/2
Reactions Uplift each end	1200	LB	(ZOH x OH x Truss Spacing) + (Average pressure x (Truss Length/2) x Truss spacing)
Reactions Gravity each end	899	LB	(Total D+L x OH x Truss Spacing) + (Total D+L x (Truss Length/2) x Truss spacing)

NU-VUE NVHTA16 (CONNECTOR #1)

ALLOWABLE UPLIFT = 2649 LBS

PARALLEL W/ WALL = 1575 LBS

PERPENDICULAR TO WALL = 2175 LBS

CHECK COMBINED LOADING

FROM DIAPHRAGM SHEAR CALCULATIONS

VL1 = 70 LBS/FT 140 LBS (SHEAR LOAD x TRUSS SPACING)

VL2 = OUT OF PLANE WALL SUCTION= WALL PRESSURE (PSF) x WALL HEIGHT/2 (FT) x 2'-0" (JOIST SPACING)

VL2 =	23.87	11.83	282.38 LBS	
		(FT)		
<u>UPLIFT</u>	<u>VL1</u>	<u>VL2</u>	<u>≤ 1.0</u>	UNITY EQUATION
ALLOW UPLIFT	L1	L2		
(+)	(+)	(+)	0	
0.45	0.09	0.13	0.67	OK

Calculations for Reactions of Roof Trusses Uplift & Gravity

TRUSSES 23'-0" SPAN

Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	30.33	PSF
	Zone 2	50.23	PSF
	Zone 3	54.34	PSF
	Zone OH	139.16	PSF
Roof Gravity Loads SLOPE > 2:12	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.57	Ft	Horizontal truss span
Slope	3	:12	
Truss Span	23.00	Ft	
Over hang	2.00	Ft	
Truss spacing	2.00	Ft	

RESULTS			
Truss angle (theta)	14.04	DEG	Tan-1(slope)
Truss height	2.88	Ft	Slope x Truss span/2
Truss Length	23.71	Ft	Square Rt ((Truss span/2)**2 x (Truss height**2)) x 2
Average uplift pressure	40.28	PSF	(Pressure Zone 1 + Pressure Zone 2)/2
Reactions Uplift each end	1512	LB	(ZOH x OH x Truss Spacing) + (Average pressure x (Truss Length/2) x Truss spacing)
Reactions Gravity each end	1247	LB	(Total D+L x OH x Truss Spacing) + (Total D+L x (Truss Length/2) x Truss spacing)

NU-VUE NVHTA16 (CONNECTOR #1)

ALLOWABLE UPLIFT = 2649 LBS
 PARALLEL W/ WALL = 1575 LBS
 PERPENDICULAR TO WALL = 2175 LBS

CHECK COMBINED LOADING

FROM DIAPHRAGM SHEAR CALCULATIONS

VL1 = 70 LBS/FT 140 LBS (SHEAR LOAD x TRUSS SPACING)
 VL2 = OUT OF PLANE WALL SUCTION= WALL PRESSURE (PSF) x WALL HEIGHT/2 (FT) x 2'-0" (JOIST SPACING)

VL2 =	23.87	11.83	282.38 LBS	
		(FT)		
<u>UPLIFT</u>	<u>VL1</u>	<u>VL2</u>	<u>≤ 1.0</u>	UNITY EQUATION
ALLOW UPLIFT	L1	L2		
(+)	(+)	(+)	0	
0.57	0.09	0.13	0.79	OK

Calculations for Reactions of Roof Trusses Uplift & Gravity

TRUSSES 23'-8" SPAN (garage)

Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	30.33	PSF
	Zone 2	50.23	PSF
	Zone 3	54.34	PSF
	Zone OH	139.16	PSF
Roof Gravity Loads SLOPE > 2:12	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.57	Ft	Horizontal truss span
Slope	3	:12	
Truss Span	23.67	Ft	
Over hang	2.00	Ft	
Truss spacing	2.00	Ft	

RESULTS			
Truss angle (theta)	14.04	DEG	Tan-1(slope)
Truss height	2.96	Ft	Slope x Truss span/2
Truss Length	24.40	Ft	Square Rt ((Truss span/2)**2 x (Truss height**2)) x 2
Average uplift pressure	40.28	PSF	(Pressure Zone 1 + Pressure Zone 2)/2
Reactions Uplift each end	1539	LB	(ZOH x OH x Truss Spacing) + (Average pressure x (Truss Length/2) x Truss spacing)
Reactions Gravity each end	1278	LB	(Total D+L x OH x Truss Spacing) + (Total D+L x (Truss Length/2) x Truss spacing)

NU-VUE NVHTA16H (CONNECTOR #2)

ALLOWABLE UPLIFT = 3117 LBS

PARALLEL W/ WALL = 1575 LBS

PERPENDICULAR TO WALL = 2175 LBS

CHECK COMBINED LOADING

FROM DIAPHRAGM SHEAR CALCULATIONS

VL1 = 70 LBS/FT 140 LBS (SHEAR LOAD x TRUSS SPACING)

VL2 = OUT OF PLANE WALL SUCTION= WALL PRESSURE (PSF) x WALL HEIGHT/2 (FT) x 2'-0" (JOIST SPACING)

VL2 =	23.87	10	238.7 LBS	
		(FT)		
<u>UPLIFT</u>	<u>VL1</u>	<u>VL2</u>	<u>≤ 1.0</u>	UNITY EQUATION
ALLOW UPLIFT	L1	L2		
(+)	(+)	(+)	0	
0.49	0.09	0.11	0.69	OK

Calculations for Reactions of Roof Trusses Uplift & Gravity

TRUSSES 37'-8" SPAN

Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone OH	139.16	PSF
Roof Gravity Loads SLOPE > 2:12	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.57	Ft	Horizontal truss span
Slope	4	:12	
Truss Span	37.67	Ft	
Over hang	2.00	Ft	
Truss spacing	2.00	Ft	

RESULTS			
Truss angle (theta)	18.43	DEG	Tan-1(slope)
Truss height	6.28	Ft	Slope x Truss span/2
Truss Length	39.71	Ft	Square Rt ((Truss span/2)**2 x (Truss height**2)) x 2
Average uplift pressure	38.54	PSF	(Pressure Zone 1 + Pressure Zone 2)/2
Reactions Uplift each end	2087	LB	(ZOH x OH x Truss Spacing) + (Average pressure x (Truss Length/2) x Truss spacing)
Reactions Gravity each end	1967	LB	(Total D+L x OH x Truss Spacing) + (Total D+L x (Truss Length/2) x Truss spacing)

NU-VUE NVHTA16 (CONNECTOR #1)

ALLOWABLE UPLIFT = 2649 LBS

PARALLEL W/ WALL = 1575 LBS

PERPENDICULAR TO WALL = 2175 LBS

CHECK COMBINED LOADING

FROM DIAPHRAGM SHEAR CALCULATIONS

VL1 = 70 LBS/FT 140 LBS (SHEAR LOAD x TRUSS SPACING)

VL2 = OUT OF PLANE WALL SUCTION= WALL PRESSURE (PSF) x WALL HEIGHT/2 (FT) x 2'-0" (JOIST SPACING)

VL2 =	23.87	10	238.7 LBS	
		(FT)		
<u>UPLIFT</u>	<u>VL1</u>	<u>VL2</u>	<u>≤ 1.0</u>	UNITY EQUATION
ALLOW UPLIFT	L1	L2		
(+)	(+)	(+)	0	
0.79	0.09	0.11	0.99	OK

Calculations for Reactions of Roof Trusses Uplift & Gravity

TRUSSES 43'-5" SPAN

Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone OH	139.16	PSF
Roof Gravity Loads SLOPE > 2:12	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.57	Ft	Horizontal truss span
Slope	4	:12	
Truss Span	43.50	Ft	
Over hang	2.00	Ft	
Truss spacing	2.00	Ft	

RESULTS			
Truss angle (theta)	18.43	DEG	Tan-1(slope)
Truss height	7.25	Ft	Slope x Truss span/2
Truss Length	45.85	Ft	Square Rt ((Truss span/2)**2 x (Truss height**2)) x 2
Average uplift pressure	38.54	PSF	(Pressure Zone 1 + Pressure Zone 2)/2
Reactions Uplift each end	2324	LB	(ZOH x OH x Truss Spacing) + (Average pressure x (Truss Length/2) x Truss spacing)
Reactions Gravity each end	2243	LB	(Total D+L x OH x Truss Spacing) + (Total D+L x (Truss Length/2) x Truss spacing)

NU-VUE NVHTA16H (CONNECTOR #2)

ALLOWABLE UPLIFT = 3117 LBS
 PARALLEL W/ WALL = 1575 LBS
 PERPENDICULAR TO WALL = 2175 LBS

CHECK COMBINED LOADING

FROM DIAPHRAGM SHEAR CALCULATIONS

VL1 = 70 LBS/FT 140 LBS (SHEAR LOAD x TRUSS SPACING)
 VL2 = OUT OF PLANE WALL SUCTION= WALL PRESSURE (PSF) x WALL HEIGHT/2 (FT) x 2'-0" (JOIST SPACING)

VL2 =	23.87	10	238.7 LBS	
		(FT)		
<u>UPLIFT</u>	<u>VL1</u>	<u>VL2</u>	<u>≤ 1.0</u>	UNITY EQUATION
ALLOW UPLIFT	L1	L2		
(+)	(+)	(+)	0	
0.75	0.09	0.11	0.94	OK

43'-5" GIRDER TRUSS HIGH ROOF (LOADED W/ 7FT JACKS)			
Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone 2H	139.16	
Roof Gravity Loads	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.90	Ft	
Slope	5	:12	
Truss Span loading girder	7.00	Ft	Horizontal truss span
Truss spacing loading girder	2.00	Ft	
Girder Over Hang	2.00	Ft	
Girder Truss Span	43.50	Ft	

RESULTS			
Truss angle (theta)	22.62	DEG	Tan-1(slope)
Truss height	1.46	Ft	Slope x Truss span/2
Truss Length	7.58	Ft	Square Rt $((\text{Truss span}/2)^2 + (\text{Truss height})^2) \times 2$
Average uplift pressure	38.54	PSF	$(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
Uniform Uplift load	185	LB/FT	Average pressure x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Uniform Gravity Load	216	LB/FT	Total D+L x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Reaction Uplift Each End	4385	LB	Uniform uplift x (Girder truss span/2 + Girder OH)
Reaction Gravity Each End	5121	LB	Uniform gravity x (Girder truss span/2 + Girder OH)

37'-8" GIRDER TRUSS HIGH ROOF (LOADED W/ 7FT JACKS)			
Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone 2H	139.16	
Roof Gravity Loads	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.90	Ft	
Slope	5	:12	
Truss Span loading girder	7.00	Ft	Horizontal truss span
Truss spacing loading girder	2.00	Ft	
Girder Over Hang	2.00	Ft	
Girder Truss Span	43.50	Ft	

RESULTS			
Truss angle (theta)	22.62	DEG	Tan-1(slope)
Truss height	1.46	Ft	Slope x Truss span/2
Truss Length	7.58	Ft	Square Rt $((\text{Truss span}/2)^2 + (\text{Truss height})^2) \times 2$
Average uplift pressure	38.54	PSF	$(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
Uniform Uplift load	185	LB/FT	Average pressure x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Uniform Gravity Load	216	LB/FT	Total D+L x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Reaction Uplift Each End	4385	LB	Uniform uplift x (Girder truss span/2 + Girder OH)
Reaction Gravity Each End	5121	LB	Uniform gravity x (Girder truss span/2 + Girder OH)

8'-8" GIRDER TRUSS HIGH ROOF (LOADED W/ 43FT TRUSSES)			
Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone 2H	139.16	
Roof Gravity Loads	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.90	Ft	
Slope	4	:12	
Truss Span loading girder	43.50	Ft	Horizontal truss span
Truss spacing loading girder	2.00	Ft	
Girder Over Hang	0.00	Ft	
Girder Truss Span	8.67	Ft	

RESULTS			
Truss angle (theta)	18.43	DEG	Tan-1(slope)
Truss height	7.25	Ft	Slope x Truss span/2
Truss Length	45.85	Ft	Square Rt $((\text{Truss span}/2)^2 + (\text{Truss height})^2) \times 2$
Average uplift pressure	38.54	PSF	$(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
Uniform Uplift load	922	LB/FT	Average pressure x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Uniform Gravity Load	1077	LB/FT	Total D+L x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Reaction Uplift Each End	3997	LB	Uniform uplift x (Girder truss span/2 + Girder OH)
Reaction Gravity Each End	4667	LB	Uniform gravity x (Girder truss span/2 + Girder OH)

14'-6" GIRDER TRUSS HIGH ROOF (LOADED W/ 43FT TRUSSES)			
Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone 2H	139.16	
Roof Gravity Loads	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.90	Ft	
Slope	4	:12	
Truss Span loading girder	43.50	Ft	Horizontal truss span
Truss spacing loading girder	2.00	Ft	
Girder Over Hang	0.00	Ft	
Girder Truss Span	14.50	Ft	

RESULTS			
Truss angle (theta)	18.43	DEG	Tan-1(slope)
Truss height	7.25	Ft	Slope x Truss span/2
Truss Length	45.85	Ft	Square Rt $((\text{Truss span}/2)^2 + (\text{Truss height})^2) \times 2$
Average uplift pressure	38.54	PSF	$(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
Uniform Uplift load	922	LB/FT	Average pressure x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Uniform Gravity Load	1077	LB/FT	Total D+L x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Reaction Uplift Each End	6685	LB	Uniform uplift x (Girder truss span/2 + Girder OH)
Reaction Gravity Each End	7806	LB	Uniform gravity x (Girder truss span/2 + Girder OH)

31'-2" GIRDER TRUSS GARAGE (LOADED W/ 7FT JACKS)			
Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone 2H	139.16	
Roof Gravity Loads	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.90	Ft	
Slope	5	:12	
Truss Span loading girder	7.00	Ft	Horizontal truss span
Truss spacing loading girder	2.00	Ft	
Girder Over Hang	2.00	Ft	
Girder Truss Span	31.20	Ft	

RESULTS			
Truss angle (theta)	22.62	DEG	Tan-1(slope)
Truss height	1.46	Ft	Slope x Truss span/2
Truss Length	7.58	Ft	Square Rt $((\text{Truss span}/2)^2 + (\text{Truss height})^2) \times 2$
Average uplift pressure	38.54	PSF	$(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
Uniform Uplift load	185	LB/FT	Average pressure x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Uniform Gravity Load	216	LB/FT	Total D+L x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Reaction Uplift Each End	3250	LB	Uniform uplift x (Girder truss span/2 + Girder OH)
Reaction Gravity Each End	3795	LB	Uniform gravity x (Girder truss span/2 + Girder OH)

23'-" GIRDER TRUSS TERRACE (LOADED W/ 7FT JACKS)			
Roof Net Uplift Pressures	ASCE 7-22		
CC PRESSURES-10PSF ROOF DL	Zone 1	28.67	PSF
	Zone 2	48.40	PSF
	Zone 3	52.35	PSF
	Zone 2H	139.16	
Roof Gravity Loads	Dead	25	PSF
	Live	20	PSF
	Total D+L	45	PSF
INPUT			
Distance for a	5.90	Ft	
Slope	5	:12	
Truss Span loading girder	7.00	Ft	Horizontal truss span
Truss spacing loading girder	2.00	Ft	
Girder Over Hang	2.00	Ft	
Girder Truss Span	23.00	Ft	

RESULTS			
Truss angle (theta)	22.62	DEG	Tan-1(slope)
Truss height	1.46	Ft	Slope x Truss span/2
Truss Length	7.58	Ft	Square Rt $((\text{Truss span}/2)^2 + (\text{Truss height})^2) \times 2$
Average uplift pressure	38.54	PSF	$(\text{Pressure Zone 1} + \text{Pressure Zone 2})/2$
Uniform Uplift load	185	LB/FT	Average pressure x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Uniform Gravity Load	216	LB/FT	Total D+L x $((\text{Truss Length}/2) + (\text{Truss spacing}/2))$
Reaction Uplift Each End	2493	LB	Uniform uplift x (Girder truss span/2 + Girder OH)
Reaction Gravity Each End	2911	LB	Uniform gravity x (Girder truss span/2 + Girder OH)

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 10'-1" SPAN**Code References**

Calculations per TMS 402-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019

Construction Type : Grouted Hollow Concrete Masonry

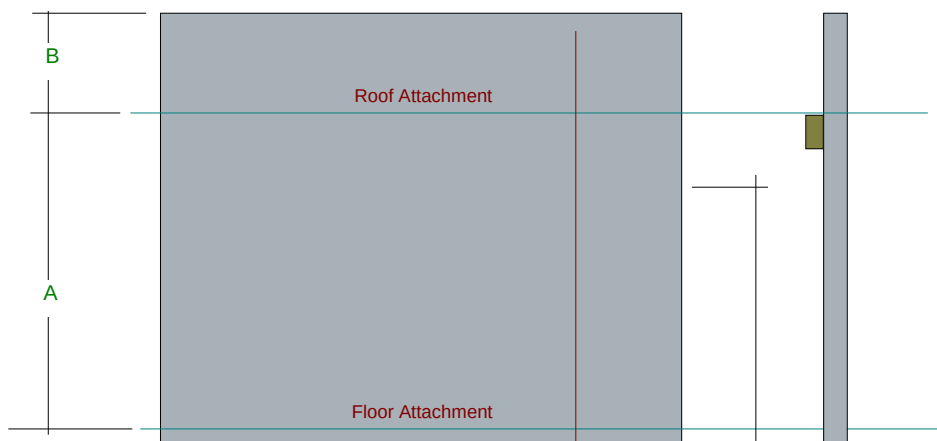
F'm	=	2.0 ksi	Nom. Wall Thickness	8 in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness	7.625 in	Min Allow Out-of-plane Defl Ra=		0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance	3.750 in	Minimum Vertical Steel %	=	0.0020
Em = f'm *	=	900.0	Lower Level Rebar . . .				
Max % of ρ_{bal}	=	0.009319	Bar Size	# 5			
Grout Density	=	140 pcf	Bar Spacing	40 in			
Block Weight		Normal Weight					
Wall Weight	=	48.0 psf					

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height	=	10.1 ft
B Parapet height	=	ft

Wall Support Condition Top & Bottom Pinned

**Vertical Loads**

Vertical Uniform Loads . . . Applied per foot of Strip Width

Ledger Load	Eccentricity	in	DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Concentric Load			0.6	0.48			k/ft

Lateral Loads

Wind Loads :

Full area WIND load 52.0 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

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 10'-1" SPAN**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 Ratio	0.4144		
		Max Mu	0.6692 k-ft	Phi * Mn	1.615 k-ft
PASS	Service Deflection Check W Only	Actual Defl. Ratio L/	820	Allowable Defl. Ratio	240.0
		Max. Deflection	0.1479 in		
PASS	Axial Load Check +1.20D+0.50Lr+W	Max Pu / Ag	29.651 psi	Max. Allow. Defl.	0.5050 in
		Location	4.882 ft	0.2 * f'm	400.0 psi
	Reinforcing Limit Check				
		Actual As/bd	0.0020	Max Allow As/bd	0.009319
Maximum Reactions for Load Combination...					
		Top Horizontal W Only			0.2626 k
		Base Horizontal W Only			0.2626 k
		Vertical Reaction +D+Lr			1.565 k

Design Maximum Combinations - Moments**Results reported for "Strip Width" = 12 in.**

Load Combination	Axial Load		Mcr k-ft	Mu k-ft	Moment Values			As Ratio	0.6 * rho bal	Bar 'd'
	Pu k	0.2*f'm*b*t k			Phi	Phi Mn k-ft	As in ²			
	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
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+1.60Lr+0.50W at 4.71 to 5.05	1.798	17.136	0.45	0.33	0.90	1.89	0.093	0.0020	0.0089	0.00
+1.20D+0.50W at 4.71 to 5.05	1.030	17.136	0.45	0.33	0.90	1.69	0.093	0.0020	0.0091	0.00
+1.20D+0.50Lr+W at 4.71 to 5.05	1.270	17.136	0.45	0.67	0.90	1.75	0.093	0.0020	0.0091	0.00
+1.20D+W at 4.71 to 5.05	1.030	17.136	0.45	0.67	0.90	1.69	0.093	0.0020	0.0091	0.00
+0.90D+W at 4.71 to 5.05	0.773	17.136	0.45	0.67	0.90	1.62	0.093	0.0020	0.0092	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		I gross in ⁴	Stiffness		Deflections	
		Mcr k-ft	Mactual k-ft		I cracked in ⁴	I effective in ⁴	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+0.60W at 4.71 to 5.05	0.859	0.45	0.40	335.60	18.21	335.600	0.012	10,024.0
+D+0.750Lr+0.450W at 4.71 to 5.05	1.219	0.45	0.30	335.60	19.05	335.600	0.009	13,353.4
+D+0.450W at 4.71 to 5.05	0.859	0.45	0.30	335.60	18.21	335.600	0.009	13,365.3
+0.60D+0.60W at 4.71 to 5.05	0.515	0.45	0.40	335.60	17.40	335.600	0.012	10,032.3
	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
W Only at 5.05 to 5.39	0.000	0.45	0.66	335.60	16.16	18.006	0.148	819.6
	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	1.085 k

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 10'-1" SPAN

+D+Lr	0.0 k	0.00 k	1.565 k
+D+0.750Lr	0.0 k	0.00 k	1.445 k
+D+0.60W	0.2 k	0.16 k	1.085 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+D+0.750Lr+0.450W	0.1 k	0.12 k	1.445 k
+D+0.450W	0.1 k	0.12 k	1.085 k
+0.60D+0.60W	0.2 k	0.16 k	0.651 k
+D+0.70E	0.0 k	0.00 k	1.085 k
+D+0.5250E	0.0 k	0.00 k	1.085 k
+0.60D+0.70E	0.0 k	0.00 k	0.651 k
Lr Only	0.0 k	0.00 k	0.480 k
W Only	0.3 k	0.26 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 11'-10" SPAN**Code References**

Calculations per TMS 402-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019

Construction Type : Grouted Hollow Concrete Masonry

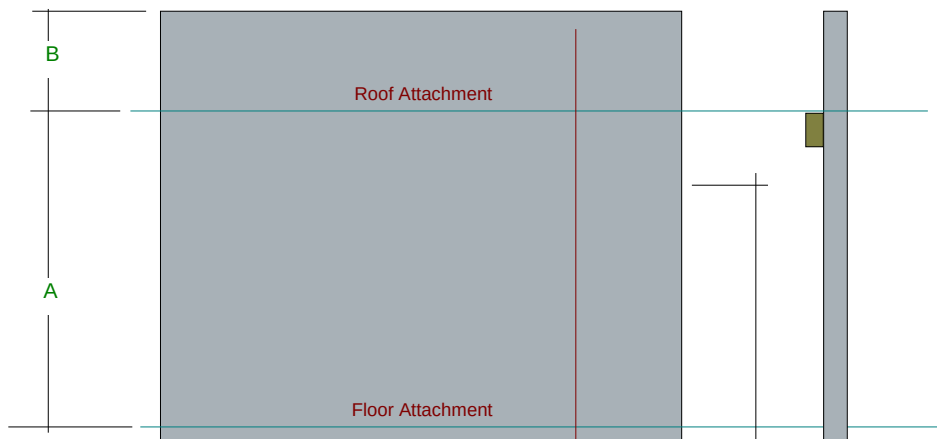
F'm	=	2.0 ksi	Nom. Wall Thickness	8 in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness	7.625 in	Min Allow Out-of-plane Defl Ra=		0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance	3.750 in	Minimum Vertical Steel %	=	0.0020
Em = f'm *	=	900.0	Lower Level Rebar . . .				
Max % of ρ_{bal}	=	0.009027	Bar Size	# 5			
Grout Density	=	140 pcf	Bar Spacing	24 in			
Block Weight		Normal Weight					
Wall Weight	=	55.0 psf					

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height	=	11.830 ft
B Parapet height	=	ft

Wall Support Condition Top & Bottom Pinned

**Vertical Loads**

Vertical Uniform Loads . . . Applied per foot of Strip Width

Ledger Load	Eccentricity	in	DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Concentric Load			1.50	0.380	0		k/ft

Lateral Loads

Wind Loads :

Full area WIND load 52.0 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

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 11'-10" SPAN**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 Ratio0.3462			
		Max Mu	0.9410 k-ft	Phi * Mn	2.718 k-ft
PASS	Service Deflection Check W Only	Actual Defl. Ratio L/	494	Allowable Defl. Ratio	240.0
		Max. Deflection	0.2871 in		
PASS	Axial Load Check +1.20D+0.50Lr+W	Max Pu / Ag	46.854 psi	Max. Allow. Defl.	0.5915 in
		Location	5.718 ft	0.2 * f'm	400.0 psi
	Reinforcing Limit Check				
		Actual As/bd	0.003333	Max Allow As/bd	0.009028
		Maximum Reactions for Load Combination...			
		Top Horizontal	W Only		0.3076 k
		Base Horizontal	W Only		0.3076 k
		Vertical Reaction	+D+Lr		2.531 k

Design Maximum Combinations - Moments**Results reported for "Strip Width" = 12 in.**

Load Combination	Axial Load		Mcr k-ft	Mu k-ft	Moment Values			As Ratio	0.6 * rho bal	Bar 'd'
	Pu k	0.2*f'm*b*t k			Phi	Phi Mn k-ft	As in^2			
	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
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+1.60Lr+0.50W at 5.52 to 5.92	2.824	20.544	0.47	0.46	0.90	3.01	0.155	0.0033	0.0085	0.00
+1.20D+0.50W at 5.52 to 5.92	2.216	20.544	0.47	0.46	0.90	2.86	0.155	0.0033	0.0087	0.00
+1.20D+0.50Lr+W at 5.52 to 5.92	2.406	20.544	0.47	0.96	0.90	2.91	0.155	0.0033	0.0087	0.00
+1.20D+W at 5.52 to 5.92	2.216	20.544	0.47	0.95	0.90	2.86	0.155	0.0033	0.0087	0.00
+0.90D+W at 5.52 to 5.92	1.662	20.544	0.47	0.94	0.90	2.72	0.155	0.0033	0.0089	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		I gross in^4	Stiffness		Deflections	
		Mcr k-ft	Mactual k-ft		I cracked in^4	I effective in^4	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+0.60W at 5.92 to 6.31	1.825	0.47	0.55	353.60	28.26	38.541	0.050	2,847.9
+D+0.750Lr+0.450W at 5.52 to 5.92	2.132	0.47	0.41	353.60	28.87	353.600	0.016	8,722.3
+D+0.450W at 5.52 to 5.92	1.847	0.47	0.41	353.60	28.31	353.600	0.016	8,730.3
+0.60D+0.60W at 5.92 to 6.31	1.095	0.47	0.55	353.60	26.80	36.978	0.050	2,843.3
	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
W Only at 5.92 to 6.31	0.000	0.47	0.91	353.60	24.55	25.518	0.287	494.5
	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	2.151 k

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: MASONRY 11'-10" SPAN

+D+Lr	0.0 k	0.00 k	2.531 k
+D+0.750Lr	0.0 k	0.00 k	2.436 k
+D+0.60W	0.2 k	0.18 k	2.151 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+D+0.750Lr+0.450W	0.1 k	0.14 k	2.436 k
+D+0.450W	0.1 k	0.14 k	2.151 k
+0.60D+0.60W	0.2 k	0.18 k	1.290 k
+D+0.70E	0.0 k	0.00 k	2.151 k
+D+0.5250E	0.0 k	0.00 k	2.151 k
+0.60D+0.70E	0.0 k	0.00 k	1.290 k
Lr Only	0.0 k	0.00 k	0.380 k
W Only	0.3 k	0.31 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 14'-6" SPAN**Code References**

Calculations per TMS 402-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019

Construction Type : Grouted Hollow Concrete Masonry

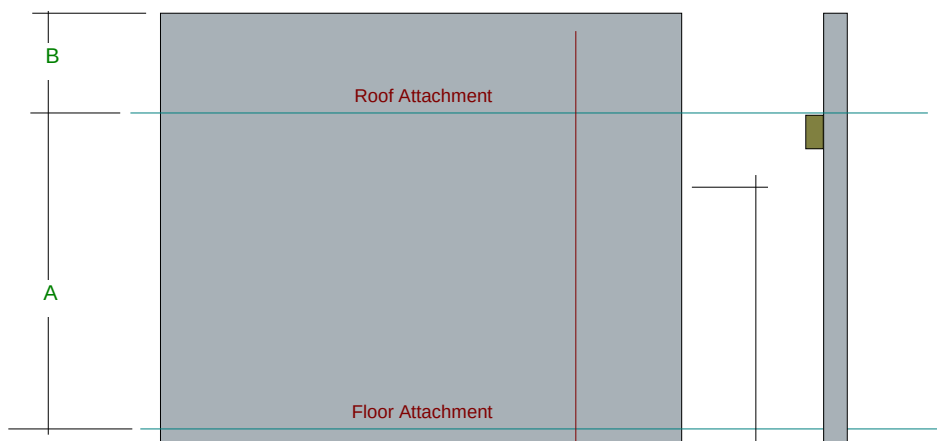
F'm	=	2 ksi	Nom. Wall Thickness	8 in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness	7.625 in	Min Allow Out-of-plane Defl Ra=		0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance	3.750 in	Minimum Vertical Steel %	=	0.0020
Em = f'm *	=	900.0	Lower Level Rebar . . .				
Max % of ρ_{bal}	=	0.008944	Bar Size	# 6			
Grout Density	=	140 pcf	Bar Spacing	16 in			
Block Weight		Normal Weight					
Wall Weight	=	63.0 psf					

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height	=	14.5 ft
B Parapet height	=	ft

Wall Support Condition Top & Bottom Pinned

**Vertical Loads**

Vertical Uniform Loads . . . Applied per foot of Strip Width

Ledger Load	Eccentricity	in	DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Concentric Load			1.75	0.350	.64		k/ft k/ft

Lateral Loads

Wind Loads :

Full area WIND load 48.0 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

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: MASONRY 14'-6" SPAN**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 Ratio0.2646			
		Max Mu	1.330 k-ft	Phi * Mn	5.026 k-ft
PASS	Service Deflection Check W Only	Actual Defl. Ratio L/	403	Allowable Defl. Ratio	240.0
		Max. Deflection	0.4313 in		
PASS	Axial Load Check +1.20D+0.50Lr+L+W	Max Pu / Ag	56.409 psi	Max. Allow. Defl.	0.7250 in
		Location	7.008 ft	0.2 * f'm	400.0 psi
	Reinforcing Limit Check				
		Actual As/bd	0.007097	Max Allow As/bd	0.008944
		Maximum Reactions for Load Combination...			
		Top Horizontal	W Only		0.3480 k
		Base Horizontal	W Only		0.3480 k
		Vertical Reaction	+D+0.750Lr+0.750L+0.450		3.406 k

Design Maximum Combinations - Moments**Results reported for "Strip Width" = 12 in.**

Load Combination	Axial Load		Mcr k-ft	Mu k-ft	Moment Values			As Ratio	0.6 * rho bal	Bar 'd'
	Pu k	0.2*f'm*b*t k			Phi	Phi Mn k-ft	As in^2			
	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
	0.000	0.000	0.00	0.00	0.00	0.00	0.000	0.0000	0.0000	0.00
+1.20D+1.60Lr+0.50W at 6.77 to 7.25	3.245	24.816	0.50	0.65	0.90	5.29	0.330	0.0071	0.0084	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 6.77 to 7.25	2.685	24.816	0.50	0.65	0.90	5.17	0.330	0.0071	0.0086	0.00
+1.20D+0.50Lr+L+W at 6.77 to 7.25	3.500	24.816	0.50	1.39	0.90	5.34	0.330	0.0071	0.0083	0.00
+1.20D+L+W at 6.77 to 7.25	3.325	24.816	0.50	1.38	0.90	5.31	0.330	0.0071	0.0083	0.00
+0.90D+W at 6.77 to 7.25	2.013	24.816	0.50	1.33	0.90	5.03	0.330	0.0071	0.0088	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		I gross in^4	Stiffness		Deflections	
		Mcr k-ft	Mactual k-ft		I cracked in^4	I effective in^4	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
	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+0.60W at 6.77 to 7.25	2.237	0.50	0.78	376.00	46.87	50.713	0.157	1,108.4
+D+0.750Lr+0.750L+0.450W at 6.77 to 7.25	2.980	0.50	0.58	376.00	47.96	65.600	0.054	3,195.7
+D+0.750L+0.450W at 6.77 to 7.25	2.717	0.50	0.58	376.00	47.57	65.366	0.054	3,214.1
+0.60D+0.60W at 6.77 to 7.25	1.342	0.50	0.77	376.00	45.52	49.518	0.155	1,124.9
	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
	0.000	0.00	0.00	0.00	0.00	0.000	0.000	0.0
W Only at 7.25 to 7.73	0.000	0.50	1.26	376.00	43.46	44.101	0.431	403.4

Masonry Slender Wall

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: MASONRY 14'-6" SPAN

0.000	0.00	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	2.663 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
+D+L	0.0 k	0.00 k	3.303 k
+D+Lr	0.0 k	0.00 k	3.013 k
+D+0.750Lr+0.750L	0.0 k	0.00 k	3.406 k
+D+0.750L	0.0 k	0.00 k	3.143 k
+D+0.60W	0.2 k	0.21 k	2.663 k
+D+0.750Lr+0.750L+0.450W	0.2 k	0.16 k	3.406 k
+D+0.750L+0.450W	0.2 k	0.16 k	3.143 k
+0.60D+0.60W	0.2 k	0.21 k	1.598 k
+D+0.70E	0.0 k	0.00 k	2.663 k
+D+0.750L+0.5250E	0.0 k	0.00 k	3.143 k
+0.60D+0.70E	0.0 k	0.00 k	1.598 k
Lr Only	0.0 k	0.00 k	0.350 k
L Only	0.0 k	0.00 k	0.640 k
W Only	0.3 k	0.35 k	0.000 k
E Only	0.0 k	0.00 k	0.000 k

Wood Ledger

Project File: MILO.ec6

LIC# : KW-06017089, Build:20.24.08.01

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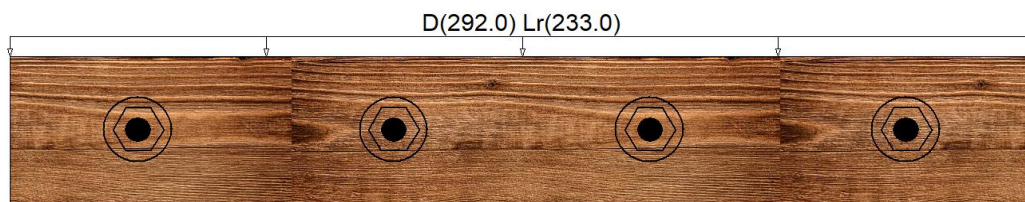
DESCRIPTION: (2) 2X8 PT WOOD LEDGER (CRITICAL LOADING)**Code Reference:**

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combinations Used : ASCE 7-16

General Information

Ledger Width	3.0 in	Design Method: ASD (using Service Load Combinations
Ledger Depth	7.250 in	Wood Stress Grade :Southern Pine, No.2: 2"-4" Thick: 8" Wi
Ledger Wood Specie	Southern Pine	Fb Allow 925.0 psi
G : Specific Gravity	0.55	Fv Allow 175.0 psi
Bolt Diameter	3/4" in	Fyb : Bolt Bending Yield 45,000 psi
Bolt Spacing	12.0 in	Concrete as Main Supporting Member
Cm - Wet Service Factor	1.0	Using 6" anchor embedment length in equations.
Ct - Temperature Factor	1.0	Using dowel bearing strength fixed at 7.5 ksi per NDS Table 11E
Cg - Group Action Factor	1.0	
C _Δ - Geometry Factor	1.0	



Analytical model uses 100 spans to ensure that all possible combinations of bolt location and load location are evaluated.
Final results are an envelope solution.

Load Data

	Dead	Roof Live	Floor Live	Snow	Wind	Seismic	Earth
Uniform Load...	292.0 plf	233.0 plf	plf	plf	plf	plf	plf
Point Load...	lbs	lbs	lbs	lbs	lbs	lbs	lbs
Spacing	in						
Offset	in						
Horizontal Shear	plf	plf	plf	plf	215.0 plf	plf	plf

Wood Ledger

Project File: MILO.ec6

LIC# : KW-06017089, Build:20.24.08.01

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DESCRIPTION: (2) 2X8 PT WOOD LEDGER (CRITICAL LOADING)**DESIGN SUMMARY****Design OK****Maximum Ledger Bending**

Load Combination . . . +D+Lr

Moment 43.750 ft-lb

fb : Actual Stress 19.976 psi

Fb : Allowable Stress 1,156.25 psi

Stress Ratio 0.01728 :1

Maximum Bolt Bearing Summary

Load Combination . . . +D+Lr

Max. Vertical Load 525.0 lbs

Bolt Allow Vertical Load 1,138.27 lbs

Max. Horizontal Load 0.0 lbs

Bolt Allow Horizontal Load 2,212.31 lbs

Dowel Bearing Strengths

(for specific gravity & bolt diameter)

Ledger, Perp to Grain 7,500.0 psi

Ledger, Parallel to Grain 7,500.0 psi

Supporting Member, Perp to Grain 2,950.0 psi

Supporting Member, Parallel to Grain 6,150.0 psi

Maximum Ledger Shear

Load Combination . . . +D+Lr

Shear 262.501 lbs

fv : Actual Stress 24.138 psi

Fv : Allowable Stress 145.833 psi

Stress Ratio 0.1655 :1

Angle of Resultant 90.0 deg

Diagonal Component 525.0 lbs

Allow Diagonal Bolt Force 1,138.27 lbs

Stress Ratio, Wood @ Bolt 0.4612 :1

Allowable Bolt CapacityNote ! Refer to NDS Section 11.3 for Bolt Capacity calculation method.**Governing Load Combination D+Lr**

Resutant Load Angle : Theta 90.0 deg Ktheta = 1.250 Fe theta = 1,138.27

Bolt Capacity - Load Perpendicular to Grain

Fem	7,500.0	Fes	2,950.0	Fyb	45,000.0
Re	2.542	Rt	2.0		
k1	1.404	k2	1.732	k3	0.9805
Im : Eq 11.3-1	Rd = 5.0	Z =	0.0 lbs		
Is : Eq 11.3-2	Rd = 5.0	Z =	1,327.50 lbs		
II : Eq 11.3-3	Rd = 4.50	Z =	2,070.74 lbs		
IIIIm : Eq 11.3-4	Rd = 4.0	Z =	2,402.01 lbs		
IIIIs : Eq 11.3-5	Rd = 4.0	Z =	910.62 lbs		
IV : Eq 11.3-6	Rd = 4.0	Z =	1,120.75 lbs		
min : Basic Design Value =				910.62 lbs	

Reference design value - Perpendicular to Grain : $Z * CM * CD * Ct * Cg * Cdelta = 1,138.27 \text{ lbs}$ **Bolt Capacity - Load Parallel to Grain**

Fem	7,500.0	Fes	6,150.0	Fyb	45,000.0
Re	1.220	Rt	2.0		
k1	0.7902	k2	1.157	k3	1.108
Im : Eq 11.3-1	Rd = 4.0	Z =	0.0 lbs		
Is : Eq 11.3-2	Rd = 4.0	Z =	3,459.38 lbs		
II : Eq 11.3-3	Rd = 3.60	Z =	3,037.51 lbs		
IIIIm : Eq 11.3-4	Rd = 3.20	Z =	3,549.25 lbs		
IIIIs : Eq 11.3-5	Rd = 3.20	Z =	1,815.33 lbs		
IV : Eq 11.3-6	Rd = 3.20	Z =	1,769.84 lbs		
Zmin : Basic Design Value =				1,769.84 lbs	

Reference design value - Parallel to Grain : $Z * CM * CD * Ct * Cg * Cdelta = 2,212.31 \text{ lbs}$

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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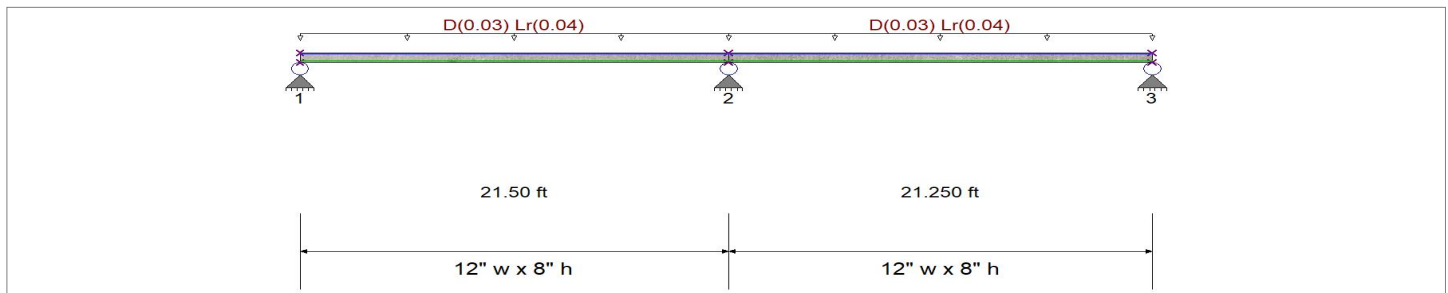
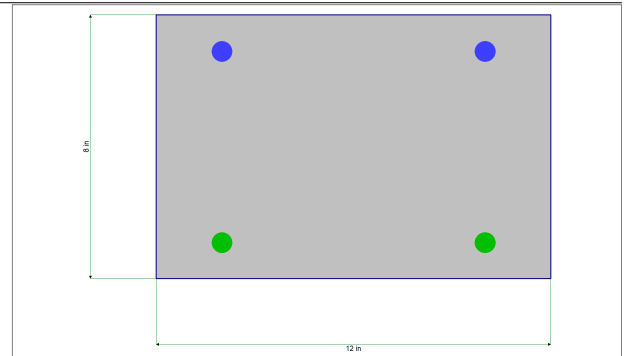
DESCRIPTION: 8" ONE WAY SLAB 2ND FLOOR (2 SPANS) OVER DINING RM/GYM**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 8.0 in

Span #1 Reinforcing....

2-#5 at 1.10 in from Top, from 0.0 to 21.50 ft in this span

2-#5 at 1.10 in from Bottom, from 0.0 to 21.50 ft in this

Span #2 Reinforcing....

2-#5 at 1.10 in from Top, from 0.0 to 21.250 ft in this span

2-#5 at 1.10 in from Bottom, from 0.0 to 21.250 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

DESIGN SUMMARY**Design OK****Maximum Bending Stress Ratio = 0.702 : 1**

Section used for this span

Typical Section

Mu : Applied

-12.337 k-ft

Mn * Phi : Allowable

17.566 k-ft

Location of maximum on span

0.000 ft

Span # where maximum occurs

Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.051 in	Ratio =	5086	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.331 in	Ratio =	779	>=240.0	Span: 2 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 2 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #5 @ d=1.1", 2- #5 @ d=6.9",	17.57	17.57	512.00	174.44	174.44
Section 2	2- #5 @ d=1.1", 2- #5 @ d=6.9",	17.57	17.57	512.00	174.44	174.44

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 8" ONE WAY SLAB 2ND FLOOR (2 SPANS) OVER DINING RM/GYM**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	1.418	4.315	1.392
Max Upward from Load Combinations	1.418	4.315	1.392
Max Upward from Load Cases	1.070	3.295	1.051
D Only	1.070	3.295	1.051
+D+Lr	1.418	4.315	1.392
+D+0.750Lr	1.336	4.049	1.313
+0.60D	0.615	2.031	0.603
Lr Only	0.324	1.069	0.317

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+Lr	0.3308	8.907		0.0000	0.000
2	+D+Lr	0.2893	12.446		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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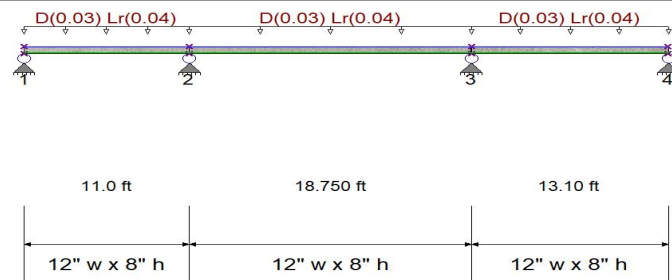
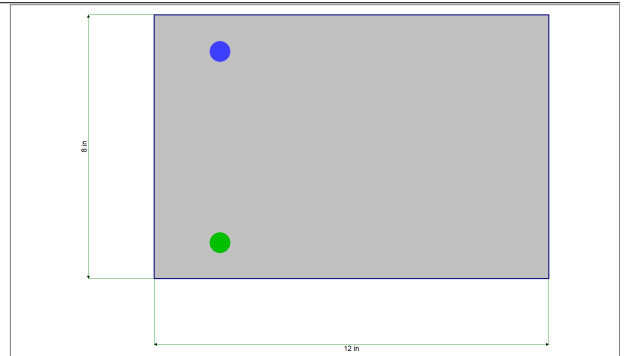
DESCRIPTION: 8" ONE WAY SLAB 2ND FLOOR (3 SPANS) OVER MASTER SUITE**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=		2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 8.0 in

Span #1 Reinforcing....

1-#5 at 1.10 in from Top, from 0.0 to 11.0 ft in this span

1-#5 at 1.10 in from Bottom, from 0.0 to 11.0 ft in this span

Span #2 Reinforcing....

1-#5 at 1.10 in from Top, from 0.0 to 18.750 ft in this span

1-#5 at 1.10 in from Bottom, from 0.0 to 18.750 ft in this span

Span #3 Reinforcing....

1-#5 at 1.10 in from Top, from 0.0 to 13.10 ft in this span

1-#5 at 1.10 in from Bottom, from 0.0 to 13.10 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

Load for Span Number 3

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.633	: 1
Section used for this span		Typical Section	
Mu : Applied		-5.927	k-ft
Mn * Phi : Allowable		9.363	k-ft
Location of maximum on span		0.000	ft
Span # where maximum occurs		Span # 3	

Maximum Deflection

Max Downward Transient Deflection	0.020 in	Ratio = 11221	>=360.0	Lr Only
Max Upward Transient Deflection	-0.001 in	Ratio = 102127	>=360.0	Lr Only
Max Downward Total Deflection	0.084 in	Ratio = 2693	>=240.0	Span: 3 : +D+Lr
Max Upward Total Deflection	-0.005 in	Ratio = 24510	>=240.0	Span: 3 : +D+Lr

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: 8" ONE WAY SLAB 2ND FLOOR (3 SPANS) OVER MASTER SUITE**Cross Section Strength & Inertia**

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	1- #5 @ d=1.1", 1- #5 @ d=6.9",	9.36	9.36	512.00	97.84	97.84
Section 2	1- #5 @ d=1.1", 1- #5 @ d=6.9",	9.36	9.36	512.00	97.84	97.84
Section 3	1- #5 @ d=1.1", 1- #5 @ d=6.9",	9.36	9.36	512.00	97.84	97.84

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	0.543	2.828	3.028	0.743
Max Upward from Load Combinations	0.543	2.828	3.028	0.743
Max Upward from Load Cases	0.413	2.149	2.301	0.564
D Only	0.413	2.149	2.301	0.564
+D+Lr	0.543	2.828	3.028	0.743
+D+0.750Lr	0.511	2.658	2.846	0.698
+0.60D	0.248	1.289	1.381	0.339
Lr Only	0.130	0.679	0.727	0.178

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location in Span (ft)	Load Combination	Max. "+" Defl (in) in Span	Location in Span (ft)
1	+D+Lr	0.0035	2.860	+D+Lr	-0.0054	9.020
2	+D+Lr	0.0835	9.375	+D+Lr	-0.0009	19.012
3	+D+Lr	0.0183	8.122	+D+Lr	-0.0024	1.310

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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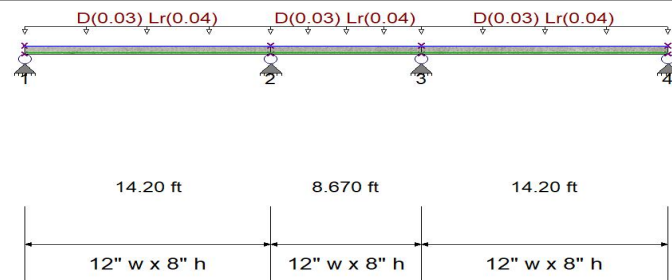
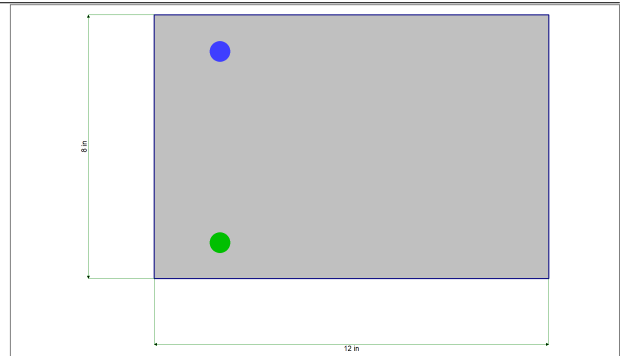
DESCRIPTION: 8" ONE WAY SLAB 2ND FLOOR BY ENTRY/LIBRARY/STUDY (3 SPAN)**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	F_y - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 8.0 in

Span #1 Reinforcing....

1-#5 at 1.10 in from Top, from 0.0 to 14.20 ft in this span

1-#5 at 1.10 in from Bottom, from 0.0 to 14.20 ft in this :

Span #2 Reinforcing....

1-#5 at 1.10 in from Top, from 0.0 to 8.670 ft in this span

1-#5 at 1.10 in from Bottom, from 0.0 to 8.670 ft in this :

Span #3 Reinforcing....

1-#5 at 1.10 in from Top, from 0.0 to 14.20 ft in this span

1-#5 at 1.10 in from Bottom, from 0.0 to 14.20 ft in this :

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

Load for Span Number 3

Uniform Load : D = 0.030, Lr = 0.040 ksf, Tributary Width = 1.0 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.410 : 1
Section used for this span		Typical Section
Mu : Applied		3.840 k-ft
Mn * Phi : Allowable		9.363 k-ft
Location of maximum on span		5.964 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.014 in	Ratio =	12021	>=360.0	Lr Only
Max Upward Transient Deflection	-0.003 in	Ratio =	30815	>=360.0	Lr Only
Max Downward Total Deflection	0.059 in	Ratio =	2885	>=240.0	Span: 3 : +D+Lr
Max Upward Total Deflection	-0.014 in	Ratio =	7395	>=240.0	Span: 3 : +D+Lr

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 8" ONE WAY SLAB 2ND FLOOR BY ENTRY/LIBRARY/STUDY (3 SPAN)**Cross Section Strength & Inertia**

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	1- #5 @ d=1.1", 1- #5 @ d=6.9",	9.36	9.36	512.00	97.84	97.84
Section 2	1- #5 @ d=1.1", 1- #5 @ d=6.9",	9.36	9.36	512.00	97.84	97.84
Section 3	1- #5 @ d=1.1", 1- #5 @ d=6.9",	9.36	9.36	512.00	97.84	97.84

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	0.994	2.095	2.095	0.994
Max Upward from Load Combinations	0.994	2.095	2.095	0.994
Max Upward from Load Cases	0.755	1.592	1.592	0.755
D Only	0.755	1.592	1.592	0.755
+D+Lr	0.994	2.095	2.095	0.994
+D+0.750Lr	0.934	1.970	1.970	0.934
+0.60D	0.453	0.955	0.955	0.453
Lr Only	0.239	0.503	0.503	0.239

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location in Span (ft)	Load Combination	Max. "+" Defl (in) in Span	Location in Span (ft)
1	+D+Lr	0.0591	6.532	+D+Lr	-0.0013	14.373
2	+D+Lr	0.0024	8.954	+D+Lr	-0.0141	4.335
3	+D+Lr	0.0591	7.668		0.0000	4.335

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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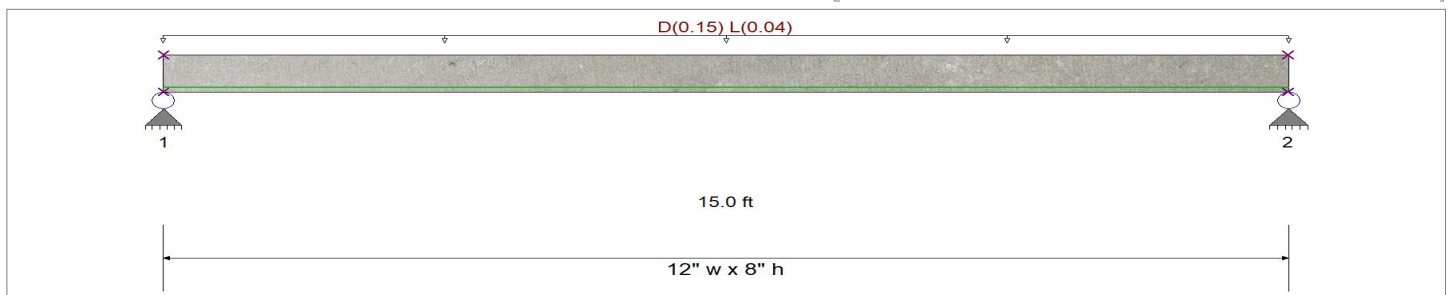
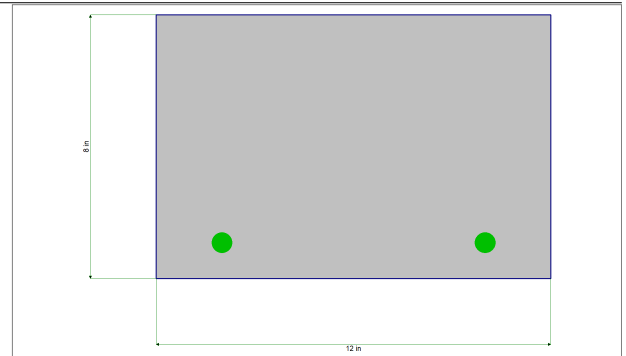
DESCRIPTION: 8" CONCRETE STAIRS (3 EQ SPANS 15 FT)**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	F_y - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 8.0 in

Span #1 Reinforcing....

2-#5 at 1.10 in from Bottom, from 0.0 to 15.0 ft in this span

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.150, L = 0.040 ksf, Tributary Width = 1.0 ft, (STAIRS)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.577 : 1
Section used for this span		Typical Section
Mu : Applied		10.125 k-ft
Mn * Phi : Allowable		17.555 k-ft
Location of maximum on span		7.514 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.028 in	Ratio =	6316	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	L Only
Max Downward Total Deflection	0.463 in	Ratio =	388	>=240.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=6.9",	17.56	0.00	512.00	169.69	2.30

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1 Support 2	
Max Upward from all Load Conditions	2.150	2.150
Max Upward from Load Combinations	2.150	2.150

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 8" CONCRETE STAIRS (3 EQ SPANS 15 FT)**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Cases	1.850	1.850
D Only	1.850	1.850
+D+L	2.150	2.150
+D+0.750L	2.075	2.075
+0.60D	1.110	1.110
L Only	0.300	0.300

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.4631	7.500		0.0000	0.000

Concrete Beam

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LIC# : KW-06017089, Build:20.24.12.17

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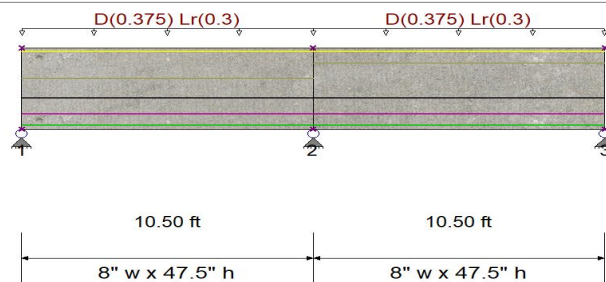
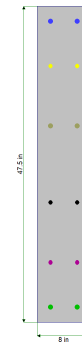
DESCRIPTION: 1B-1**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup =			2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 47.50 in

Span #1 Reinforcing....

- 2-#6 at 2.30 in from Top, from 0.0 to 10.50 ft in this span
- 2-#5 at 9.0 in from Bottom, from 0.0 to 10.50 ft in this span
- 2-#5 at 9.0 in from Top, from 0.0 to 10.50 ft in this span

- 2-#6 at 2.30 in from Bottom, from 0.0 to 10.50 ft in this :
- 2-#5 at 18.0 in from Bottom, from 0.0 to 10.50 ft in this :
- 2-#6 at 18.0 in from Top, from 0.0 to 10.50 ft in this spa

Span #2 Reinforcing....

- 2-#6 at 2.30 in from Top, from 0.0 to 10.50 ft in this span
- 2-#5 at 9.0 in from Bottom, from 0.0 to 10.50 ft in this span
- 2-#5 at 18.0 in from Top, from 0.0 to 10.50 ft in this span

- 2-#6 at 2.30 in from Bottom, from 0.0 to 10.50 ft in this :
- 2-#5 at 18.0 in from Bottom, from 0.0 to 10.50 ft in this :
- 2-#5 at 9.0 in from Top, from 0.0 to 10.50 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 15.0 ft, (LOW ROOF)

Load for Span Number 2

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 15.0 ft, (LOW ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.049 : 1
Section used for this span		Typical Section
Mu : Applied		-19.144 k-ft
Mn * Phi : Allowable		389.211 k-ft
Location of maximum on span		0.000 ft
Span # where maximum occurs		Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0 < 360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360.0	Lr Only
Max Downward Total Deflection	0.000 in	Ratio =	0 < 240.0	Span: 2 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0 < 240.0	Span: 2 : +D+Lr

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 1B-1**Cross Section Strength & Inertia**

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #6 @ d=2.3", 2- #6 @ d=45.2", 2- #5 @ d=38.5", 2- #5 @	401.86	415.32	71,447.92	20,394.90	21,078.44
Section 2	2- #6 @ d=2.3", 2- #6 @ d=45.2", 2- #5 @ d=38.5", 2- #5 @	389.21	389.21	71,447.92	20,285.74	20,285.74

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	4.164	13.882	4.164
Max Upward from Load Combinations	4.164	13.882	4.164
Max Upward from Load Cases	2.983	9.944	2.983
D Only	2.983	9.944	2.983
+D+Lr	4.164	13.882	4.164
+D+0.750Lr	3.869	12.897	3.869
+0.60D	1.790	5.966	1.790
Lr Only	1.181	3.937	1.181

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location in Span (ft)	Load Combination	Max. "+" Defl (in) in Span	Location in Span (ft)
1	+D+Lr	0.0005	4.350		0.0000	0.000
2	+D+Lr	0.0005	6.150		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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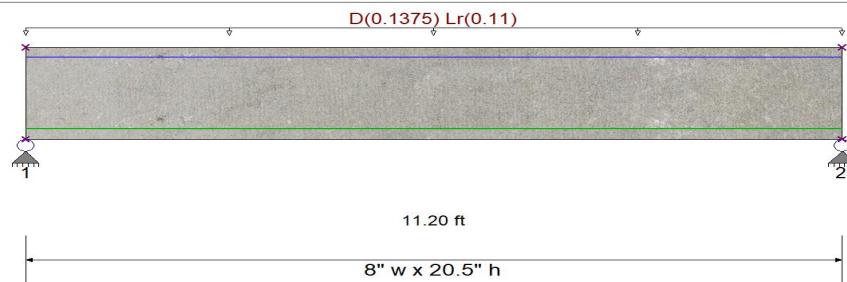
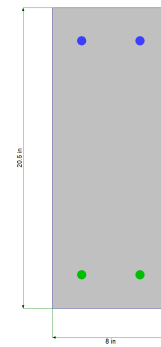
DESCRIPTION: 1B-2 FAMILY/TERR**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 20.50 in

Span #1 Reinforcing....

2-#5 at 2.250 in from Top, from 0.0 to 11.20 ft in this span

2-#5 at 2.30 in from Bottom, from 0.0 to 11.20 ft in this :

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 5.50 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.175 : 1
Section used for this span		Typical Section
Mu : Applied		8.454 k-ft
Mn * Phi : Allowable		48.266 k-ft
Location of maximum on span		5.610 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.002 in	Ratio =	61900	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.008 in	Ratio =	16501	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.25", 2- #5 @ d=18.2",	48.27	48.42	5,743.42	1,345.90	1,352.99

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1 Support 2	
Max Upward from all Load Conditions	2.311	2.311
Max Upward from Load Combinations	2.311	2.311

Concrete Beam

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LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 1B-2 FAMILY/TERR**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Cases	1.695	1.695
D Only	1.695	1.695
+D+Lr	2.311	2.311
+D+0.750Lr	2.157	2.157
+0.60D	1.017	1.017
Lr Only	0.616	0.616

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+Lr	0.0081	5.600		0.0000	0.000

Concrete Beam

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LIC# : KW-06017089, Build:20.24.12.17

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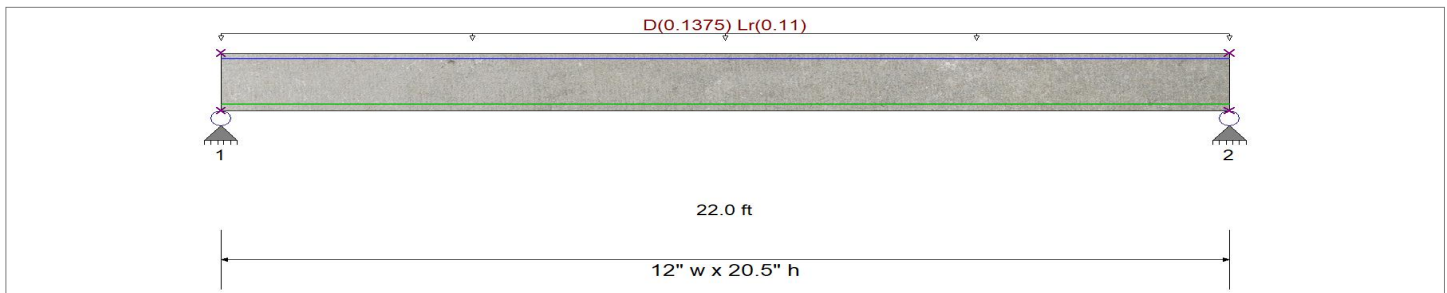
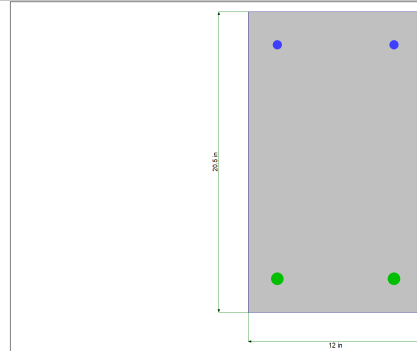
DESCRIPTION: 1B-4**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 20.50 in

Span #1 Reinforcing....

2-#5 at 2.250 in from Top, from 0.0 to 22.0 ft in this span

2-#7 at 2.30 in from Bottom, from 0.0 to 22.0 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 5.50 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.420 : 1
Section used for this span		Typical Section
Mu : Applied		38.614 k-ft
Mn * Phi : Allowable		91.929 k-ft
Location of maximum on span		11.020 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.022 in	Ratio =	12251	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.100 in	Ratio =	2631	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.25", 2- #7 @ d=18.2",	91.93	50.17	8,615.13	2,477.23	1,438.79

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	5.447	5.447
Max Upward from Load Combinations	5.447	5.447

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 1B-4**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Cases	4.237	4.237
D Only	4.237	4.237
+D+Lr	5.447	5.447
+D+0.750Lr	5.145	5.145
+0.60D	2.542	2.542
Lr Only	1.210	1.210

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+Lr	0.1003	11.000		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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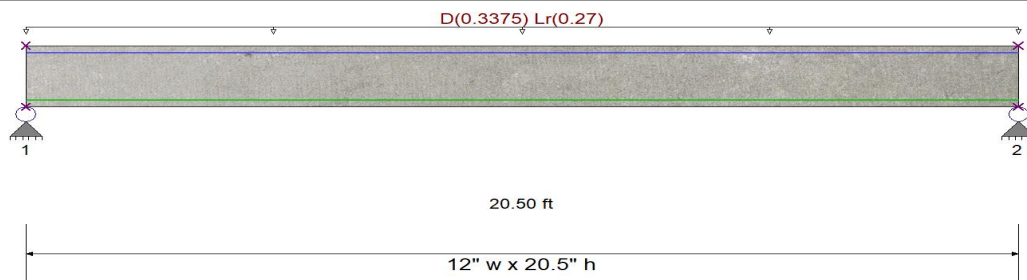
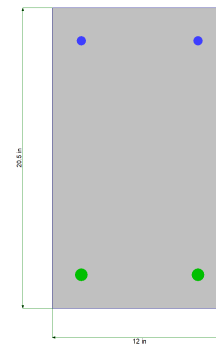
DESCRIPTION: 1B-5**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 20.50 in

Span #1 Reinforcing....

2-#5 at 2.250 in from Top, from 0.0 to 20.50 ft in this span

2-#7 at 2.30 in from Bottom, from 0.0 to 20.50 ft in this :

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 13.50 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.648	: 1
Typical Section			
Section used for this span			
Mu : Applied		59.583	k-ft
Mn * Phi : Allowable		91.929	k-ft
Location of maximum on span		10.269	ft
Span # where maximum occurs		Span # 1	

Maximum Deflection

Max Downward Transient Deflection	0.040 in	Ratio =	6168	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.259 in	Ratio =	947	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.25", 2- #7 @ d=18.2",	91.93	50.17	8,615.13	2,477.23	1,438.79

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	8.766	8.766
Max Upward from Load Combinations	8.766	8.766

Concrete Beam

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LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 1B-5**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Cases	5.998	5.998
D Only	5.998	5.998
+D+Lr	8.766	8.766
+D+0.750Lr	8.074	8.074
+0.60D	3.599	3.599
Lr Only	2.767	2.768

Shear Stirrup Requirements

Between 0.00 to 2.09 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in
 Between 2.13 to 18.37 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 18.41 to 20.46 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+Lr	0.2595	10.250		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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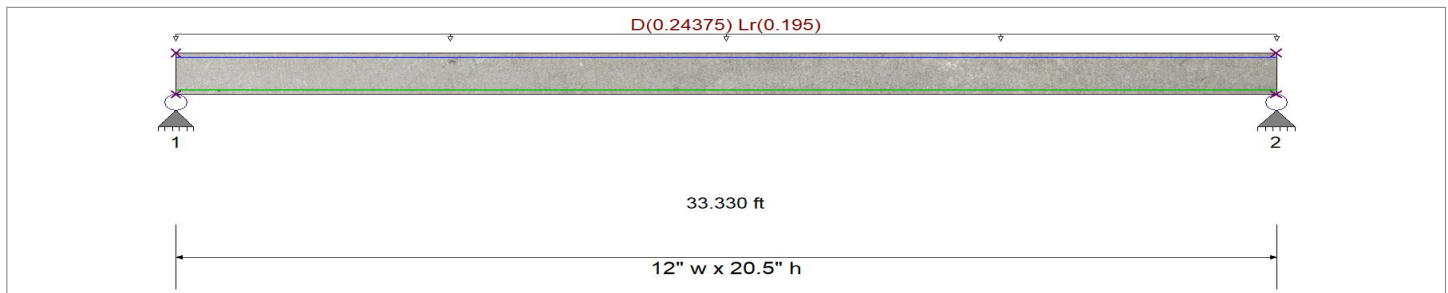
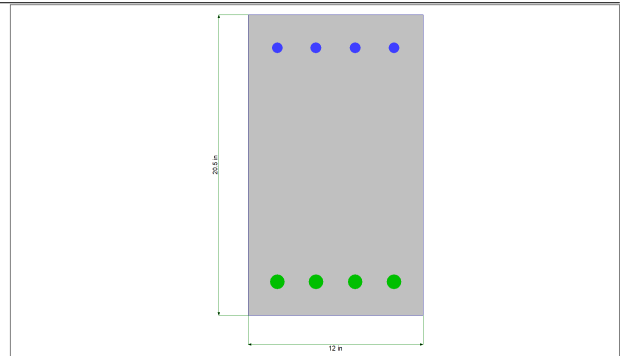
DESCRIPTION: 1B-6**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 20.50 in

Span #1 Reinforcing....

4-#6 at 2.250 in from Top, from 0.0 to 33.330 ft in this span

4-#8 at 2.30 in from Bottom, from 0.0 to 33.330 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 9.750 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.545 : 1
Section used for this span		Typical Section
Mu : Applied		125.218 k-ft
Mn * Phi : Allowable		229.826 k-ft
Location of maximum on span		16.635 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.201 in	Ratio =	1987	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	1.117 in	Ratio =	358	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 4- #6 @ d=2.25", 4- #8 @ d=18.2",	229.83	132.39	8,615.13	5,373.78	3,560.97

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1 Support 2	
Max Upward from all Load Conditions	11.440	11.440
Max Upward from Load Combinations	11.440	11.440

Concrete Beam

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DESCRIPTION: 1B-6**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Cases	8.190	8.190
D Only	8.190	8.190
+D+Lr	11.440	11.440
+D+0.750Lr	10.627	10.627
+0.60D	4.914	4.914
Lr Only	3.250	3.250

Shear Stirrup Requirements

Between 0.00 to 6.62 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in
 Between 6.68 to 26.65 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 26.71 to 33.27 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 9.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+Lr	1.1168	16.665		0.0000	0.000

Concrete Beam

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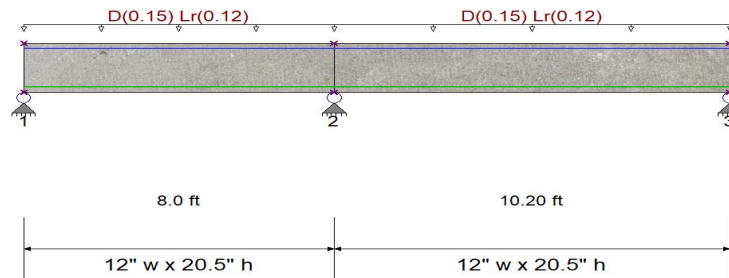
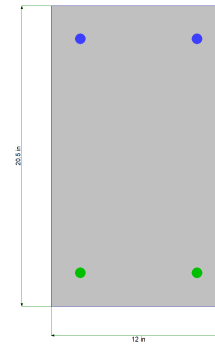
DESCRIPTION: 1B-7**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 20.50 in

Span #1 Reinforcing....

2-#6 at 2.250 in from Top, from 0.0 to 8.0 ft in this span

2-#6 at 2.30 in from Bottom, from 0.0 to 8.0 ft in this span

Span #2 Reinforcing....

2-#6 at 2.250 in from Top, from 0.0 to 10.20 ft in this span

2-#6 at 2.30 in from Bottom, from 0.0 to 10.20 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 6.0 ft, (ROOF)

Load for Span Number 2

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 6.0 ft, (ROOF)

DESIGN SUMMARY**Design OK****Maximum Bending Stress Ratio = 0.105 : 1**

Section used for this span

Typical Section

Mu : Applied -7.231 k-ft

Mn * Phi : Allowable 69.007 k-ft

Location of maximum on span 0.000 ft

Span # where maximum occurs Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0 < 360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360.0	Lr Only
Max Downward Total Deflection	0.002 in	Ratio =	51145 >= 240.0	Span: 2 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0 < 240.0	Span: 2 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #6 @ d=2.25", 2- #6 @ d=18.2",	68.77	69.01	8,615.13	1,925.77	1,935.94
Section 2	2- #6 @ d=2.25", 2- #6 @ d=18.2",	68.77	69.01	8,615.13	1,925.77	1,935.94

Concrete Beam

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DESCRIPTION: 1B-7**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	1.372	5.959	2.092
Max Upward from Load Combinations	1.372	5.959	2.092
Max Upward from Load Cases	1.054	4.578	1.607
D Only	1.054	4.578	1.607
+D+Lr	1.372	5.959	2.092
+D+0.750Lr	1.292	5.613	1.971
+0.60D	0.632	2.747	0.964
Lr Only	0.318	1.381	0.485

Shear Stirrup RequirementsEntire Beam Span Length : $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+Lr	0.0004	2.857	+D+Lr	-0.0001	7.200
2	+D+Lr	0.0024	5.683		0.0000	7.200

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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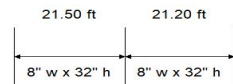
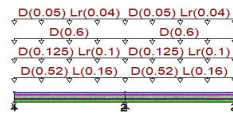
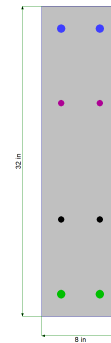
DESCRIPTION: 2B-2**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup =		=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 32.0 in

Span #1 Reinforcing....

2-#7 at 2.30 in from Top, from 0.0 to 21.50 ft in this span

2-#5 at 10.0 in from Top, from 0.0 to 21.50 ft in this span

2-#7 at 2.30 in from Bottom, from 0.0 to 21.50 ft in this :

2-#5 at 10.0 in from Bottom, from 0.0 to 21.50 ft in this :

Span #2 Reinforcing....

2-#7 at 2.30 in from Top, from 0.0 to 21.20 ft in this span

2-#5 at 10.0 in from Top, from 0.0 to 21.20 ft in this span

2-#7 at 2.30 in from Bottom, from 0.0 to 21.20 ft in this :

2-#5 at 10.0 in from Bottom, from 0.0 to 21.20 ft in this :

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 4.0 ft, (2ND FL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 5.0 ft, (ROOF)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 2.0 ft, (LOW ROOF)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 4.0 ft, (2ND FL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 5.0 ft, (ROOF)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 2.0 ft, (LOW ROOF)

Concrete Beam

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-2**DESIGN SUMMARY****Design OK****Maximum Bending Stress Ratio = 0.569 : 1**

Section used for this span

Typical Section

Mu : Applied

-128.067 k-ft

Mn * Phi : Allowable

224.963 k-ft

Location of maximum on span

0.000 ft

Span # where maximum occurs

Span # 2

Maximum Deflection

Max Downward Transient Deflection 0.005 in Ratio = 54099 >=360.0 Lr Only

Max Upward Transient Deflection 0.000 in Ratio = 0 <360.0 L Only

Max Downward Total Deflection 0.081 in Ratio = 3194 >=240.0 Span: 2 : +D+0.750Lr+0.750L

Max Upward Total Deflection 0.000 in Ratio = 0 <240.0 Span: 2 : +D+0.750Lr+0.750L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #7 @ d=2.3", 2- #7 @ d=29.7", 2- #5 @ d=10", 2- #5 @ d=10"	224.96	224.96	21,845.33	8,084.52	8,084.52
Section 2 2- #7 @ d=2.3", 2- #7 @ d=29.7", 2- #5 @ d=10", 2- #5 @ d=10"	224.96	224.96	21,845.33	8,084.52	8,084.52

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	15.068	46.099	14.744
Max Upward from Load Combinations	15.068	46.099	14.744
Max Upward from Load Cases	13.205	40.175	12.923
D Only	13.205	40.175	12.923
+D+L	14.544	44.360	14.232
+D+Lr	14.381	43.828	14.073
+D+0.750Lr+0.750L	15.068	46.099	14.744
+D+0.750L	14.216	43.301	13.911
+0.60D	7.573	24.810	7.399
Lr Only	1.134	3.736	1.108
L Only	1.296	4.270	1.266

Shear Stirrup RequirementsBetween 0.00 to 4.21 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 12.000 inBetween 4.30 to 11.93 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.Between 12.02 to 30.93 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 12.000 inBetween 31.02 to 38.63 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.Between 38.72 to 42.61 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 12.000 in**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+0.750Lr+0.750L	0.0808	8.907		0.0000	0.000
2	+D+0.750Lr+0.750L	0.0690	12.417		0.0000	0.000

Concrete Beam

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LIC# : KW-06017089, Build:20.24.12.17

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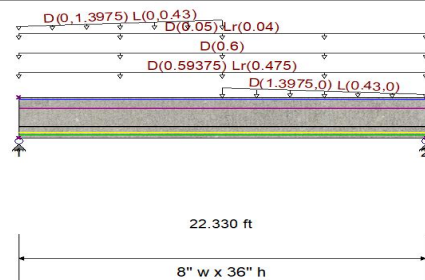
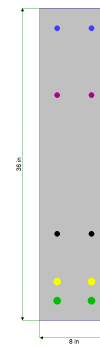
DESCRIPTION: 2B-3**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup =		=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 36.0 in

Span #1 Reinforcing....

2-#5 at 2.30 in from Top, from 0.0 to 22.330 ft in this span

2-#5 at 10.0 in from Top, from 0.0 to 22.330 ft in this span

2-#7 at 4.50 in from Bottom, from 0.0 to 22.330 ft in this span

2-#7 at 2.30 in from Bottom, from 0.0 to 22.330 ft in this

2-#5 at 10.0 in from Bottom, from 0.0 to 22.330 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Varying Uniform Load : D= 0.130->0.0, L= 0.040->0.0 ksf, Extent = 11.165 --> 22.330 ft, Trib Width = 10.750 ft, (2ND FL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (ROOF)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 2.0 ft, (LOW ROOF)

Varying Uniform Load : D= 0.0->0.130, L= 0.0->0.040 ksf, Extent = 0.0 --> 11.165 ft, Trib Width = 10.750 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.666 : 1
Section used for this span		Typical Section
Mu : Applied		253.625 k-ft
Mn * Phi : Allowable		380.978 k-ft
Location of maximum on span		11.185 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.030 in	Ratio =	9034	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.335 in	Ratio =	799	>=240.0	Span: 1 : +D+0.750Lr+0.750L
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+0.750Lr+0.750L

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-3**Cross Section Strength & Inertia**

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.3", 2- #7 @ d=33.7", 2- #5 @ d=10", 2- #5 @ d=10"	380.98	179.15	31,104.00	15,658.30	7,431.30

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	31.039	31.039
Max Upward from Load Combinations	31.039	31.039
Max Upward from Load Cases	24.926	24.926
D Only	24.926	24.926
+D+L	27.326	27.326
+D+Lr	30.676	30.676
+D+0.750Lr+0.750L	31.039	31.039
+D+0.750L	26.726	26.726
+0.60D	14.956	14.956
Lr Only	5.750	5.750
L Only	2.400	2.400

Shear Stirrup Requirements

Between 0.00 to 6.43 ft, $\Phi V_c < V_u$, Req'd Vs = 0.06416, use #3 stirrups spaced at 14.000 in
 Between 6.47 to 8.95 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 15.000 in
 Between 8.99 to 13.34 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 13.38 to 15.86 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 15.000 in
 Between 15.90 to 22.29 ft, $\Phi V_c < V_u$, Req'd Vs = 20.205, use #3 stirrups spaced at 14.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+0.750Lr+0.750L	0.3353	11.165		0.0000	0.000

Concrete Beam

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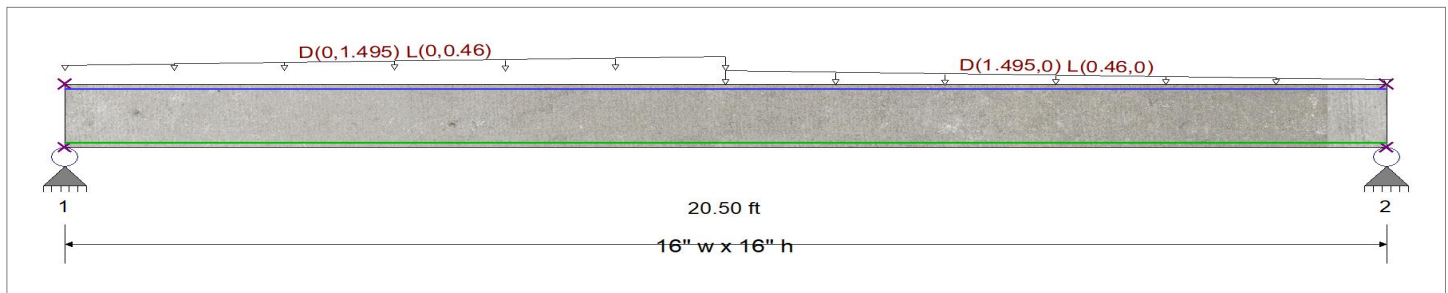
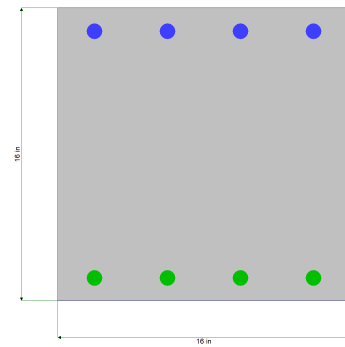
DESCRIPTION: 2B-4**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 16.0 in, Height = 16.0 in

Span #1 Reinforcing....

4-#7 at 1.250 in from Top, from 0.0 to 20.50 ft in this span

4-#7 at 1.250 in from Bottom, from 0.0 to 20.50 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Varying Uniform Load : D= 0.130->0.0, L= 0.040->0.0 ksf, Extent = 10.250 -->> 20.50 ft, Trib Width = 11.50 ft, (2ND FL)

Varying Uniform Load : D= 0.0->0.130, L= 0.0->0.040 ksf, Extent = 0.0 -->> 10.250 ft, Trib Width = 11.50 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.709 : 1
Section used for this span		Typical Section
Mu : Applied		104.852 k-ft
Mn * Phi : Allowable		147.885 k-ft
Location of maximum on span		10.269 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.069 in	Ratio =	3586	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	L Only
Max Downward Total Deflection	0.618 in	Ratio =	397	>=240.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
Cross Section Bar Layout Description		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	4- #7 @ d=1.25", 4- #7 @ d=14.75",	147.88	147.88	5,461.33	3,038.30	3,038.30

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-4**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	12.662	12.662
Max Upward from Load Combinations	12.662	12.662
Max Upward from Load Cases	10.304	10.304
D Only	10.304	10.304
+D+L	12.662	12.662
+D+0.750L	12.072	12.072
+0.60D	6.182	6.182
L Only	2.358	2.358

Shear Stirrup Requirements

Between 0.00 to 6.05 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 6.09 to 14.41 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 14.45 to 20.46 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.6184	10.250		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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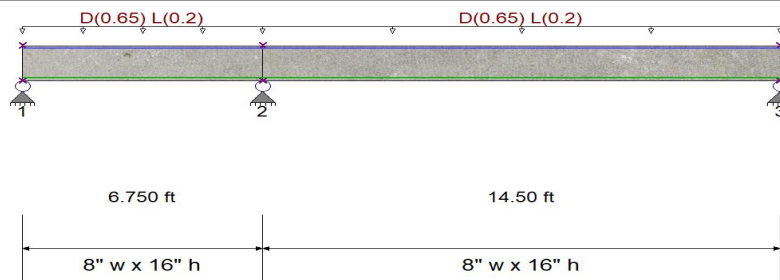
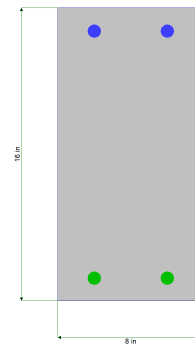
DESCRIPTION: 2B-5**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 16.0 in

Span #1 Reinforcing....

2-#6 at 1.250 in from Top, from 0.0 to 6.750 ft in this span

2-#6 at 1.250 in from Bottom, from 0.0 to 6.750 ft in this

Span #2 Reinforcing....

2-#6 at 1.250 in from Top, from 0.0 to 14.50 ft in this span

2-#6 at 1.250 in from Bottom, from 0.0 to 14.50 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 5.0 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 5.0 ft, (2ND FL)

DESIGN SUMMARY**Design OK****Maximum Bending Stress Ratio = 0.454 : 1**

Section used for this span

Typical Section

Mu : Applied

-24.770 k-ft

Mn * Phi : Allowable

54.602 k-ft

Location of maximum on span

0.000 ft

Span # where maximum occurs

Span # 2

Maximum Deflection

Max Downward Transient Deflection 0.013 in Ratio = 13415 >=360.0 L Only

Max Upward Transient Deflection -0.001 in Ratio = 62258 >=360.0 L Only

Max Downward Total Deflection 0.097 in Ratio = 1802 >=240.0 Span: 2 : +D+L

Max Upward Total Deflection -0.007 in Ratio = 11016 >=240.0 Span: 2 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #6 @ d=1.25", 2- #6 @ d=14.75",	54.60	54.60	2,730.67	1,170.18	1,170.18
Section 2	2- #6 @ d=1.25", 2- #6 @ d=14.75",	54.60	54.60	2,730.67	1,170.18	1,170.18

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-5**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	0.390	14.672	5.740
Max Upward from Load Combinations	0.390	14.672	5.740
Max Upward from Load Cases	0.365	11.593	4.593
D Only	0.365	11.593	4.593
+D+L	0.390	14.672	5.740
+D+0.750L	0.385	13.900	5.454
+0.60D	0.210	6.969	2.752
L Only	0.090	2.982	1.178

Shear Stirrup RequirementsBetween 0.00 to 4.52 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.Between 4.55 to 11.31 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 inBetween 11.37 to 19.36 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.Between 19.42 to 21.19 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.0021	6.957	+D+L	-0.0074	4.532
2	+D+L	0.0965	8.079		0.0000	4.532

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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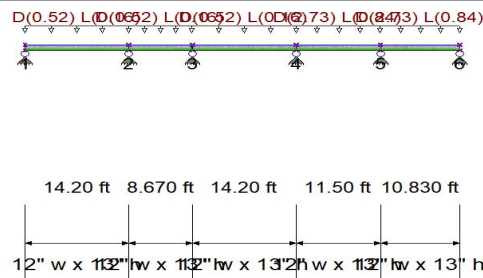
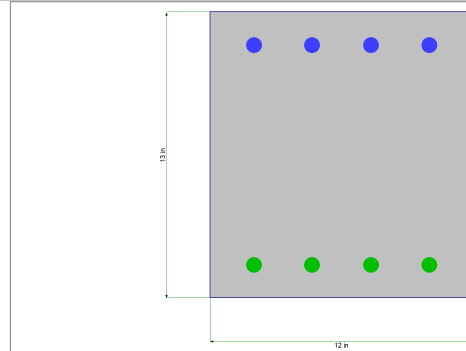
DESCRIPTION: 2B-6**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	F_y - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 13.0 in

Span #1 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 14.20 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 14.20 ft in this :

Span #2 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 8.670 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 8.670 ft in this :

Span #3 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 14.20 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 14.20 ft in this :

Span #4 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 11.50 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 11.50 ft in this :

Span #5 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 10.830 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 10.830 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 4.0 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 4.0 ft, (2ND FL)

Load for Span Number 3

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 4.0 ft, (2ND FL)

Load for Span Number 4

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 21.0 ft, (2ND FL)

Load for Span Number 5

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 21.0 ft, (2ND FL)

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-6**DESIGN SUMMARY****Design OK**

Maximum Bending Stress Ratio = 0.814 : 1
 Section used for this span **Typical Section**
 Mu : Applied -66.417 k-ft
 Mn * Phi : Allowable 81.607 k-ft
 Location of maximum on span 0.000 ft
 Span # where maximum occurs Span # 5

Maximum Deflection

Max Downward Transient Deflection 0.017 in Ratio = 7827 >=360.0 L Only
 Max Upward Transient Deflection -0.002 in Ratio = 67249 >=360.0 L Only
 Max Downward Total Deflection 0.125 in Ratio = 1036 >=240.0 Span: 5 : +D+L
 Max Upward Total Deflection -0.009 in Ratio = 11310 >=240.0 Span: 5 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 4- #6 @ d=1.5", 4- #6 @ d=11.5",	81.61	81.61	2,197.00	1,265.54	1,265.54
Section 2 4- #6 @ d=1.5", 4- #6 @ d=11.5",	81.61	81.61	2,197.00	1,265.54	1,265.54
Section 3 4- #6 @ d=1.5", 4- #6 @ d=11.5",	81.61	81.61	2,197.00	1,265.54	1,265.54
Section 4 4- #6 @ d=1.5", 4- #6 @ d=11.5",	81.61	81.61	2,197.00	1,265.54	1,265.54
Section 5 4- #6 @ d=1.5", 4- #6 @ d=11.5",	81.61	81.61	2,197.00	1,265.54	1,265.54

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3	Support 4	Support 5	Support 6
Max Upward from all Load Conditions	4.847	11.913	6.812	26.802	48.344	15.538
Max Upward from Load Combinations	4.847	11.913	6.812	26.802	48.344	15.538
Max Upward from Load Cases	3.946	9.539	5.620	21.075	37.305	12.083
D Only	3.946	9.539	5.620	21.075	37.305	12.083
+D+L	4.847	11.913	6.812	26.802	48.344	15.538
+D+0.750L	4.622	11.318	6.511	25.380	45.577	14.676
+0.60D	2.367	5.729	3.347	12.777	22.174	7.346
L Only	0.930	2.284	1.241	5.779	10.984	3.470

Shear Stirrup Requirements

Between 0.00 to 12.26 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 12.59 to 14.40 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 5.000 in
 Between 14.59 to 33.84 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 34.17 to 40.99 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 5.000 in
 Between 41.25 to 43.34 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 43.60 to 53.99 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 5.000 in
 Between 54.23 to 56.20 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 56.45 to 59.15 ft, $\Phi V_c < V_u$, Req'd Vs = 5.834, use #3 stirrups spaced at 5.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.0712	5.809	+D+L	-0.0024	14.594
2	+D+L	0.0025	9.315	+D+L	-0.0092	3.547
3	+D+L	0.0140	4.518	+D+L	-0.0104	12.264
4	+D+L	0.0806	5.750		0.0000	12.264
5	+D+L	0.1254	6.400		0.0000	12.264

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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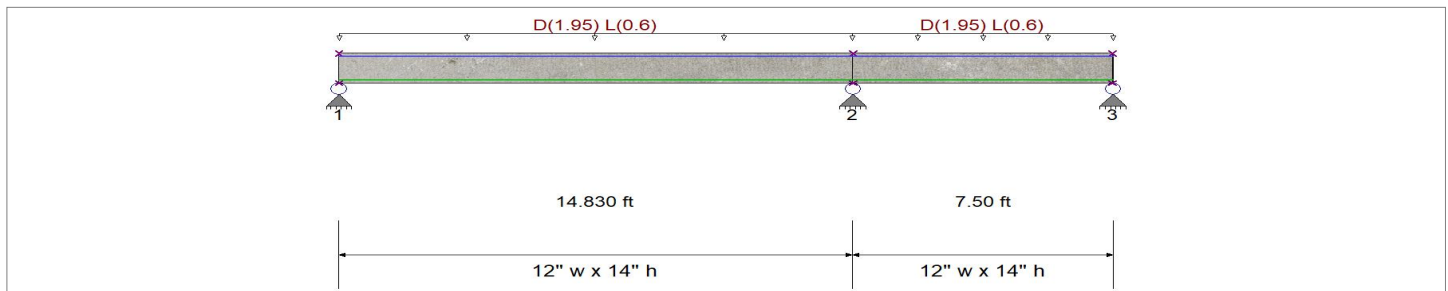
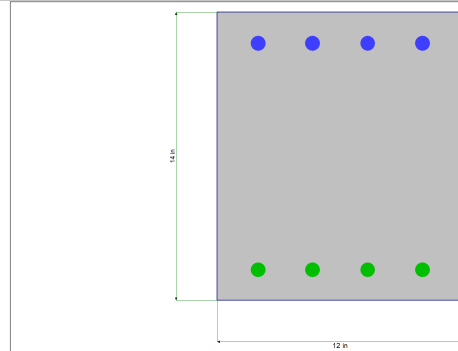
DESCRIPTION: 2B-7**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 14.0 in

Span #1 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 14.830 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 14.830 ft in this span

Span #2 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 7.50 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 7.50 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 15.0 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 15.0 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.807 : 1
Section used for this span		Typical Section
Mu : Applied		-72.229 k-ft
Mn * Phi : Allowable		89.527 k-ft
Location of maximum on span		0.000 ft
Span # where maximum occurs		Span # 2

Maximum Deflection

Max Downward Transient Deflection	0.042 in	Ratio =	4195	>=360.0	L Only
Max Upward Transient Deflection	-0.004 in	Ratio =	20810	>=360.0	L Only
Max Downward Total Deflection	0.336 in	Ratio =	528	>=240.0	Span: 2 : +D+L
Max Upward Total Deflection	-0.031 in	Ratio =	2896	>=240.0	Span: 2 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	4- #6 @ d=1.5", 4- #6 @ d=12.5",	89.53	89.53	2,744.00	1,527.83	1,527.83
Section 2	4- #6 @ d=1.5", 4- #6 @ d=12.5",	89.53	89.53	2,744.00	1,527.83	1,527.83

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-7**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	16.339	41.742	2.637
Max Upward from Load Combinations	16.339	41.742	2.637
Max Upward from Load Cases	12.720	32.573	2.028
D Only	12.720	32.573	2.028
+D+L	16.339	41.742	2.637
+D+0.750L	15.433	39.456	2.481
+0.60D	7.625	19.566	1.202
L Only	3.615	9.183	0.600

Shear Stirrup Requirements

Between 0.00 to 4.24 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in
 Between 4.30 to 7.75 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 7.81 to 19.18 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in
 Between 19.21 to 22.30 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.3364	6.568	+D+L	-0.0032	14.937
2	+D+L	0.0000	7.500	+D+L	-0.0311	2.250

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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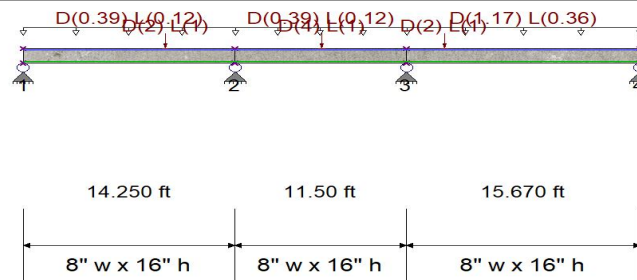
DESCRIPTION: 2B-8**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=		2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 16.0 in

Span #1 Reinforcing....

2-#7 at 1.250 in from Top, from 0.0 to 14.250 ft in this span

2-#7 at 1.250 in from Bottom, from 0.0 to 14.250 ft in th

Span #2 Reinforcing....

2-#7 at 1.250 in from Top, from 0.0 to 11.50 ft in this span

2-#7 at 1.250 in from Bottom, from 0.0 to 11.50 ft in this

Span #3 Reinforcing....

2-#7 at 1.250 in from Top, from 0.0 to 15.670 ft in this span

2-#7 at 1.250 in from Bottom, from 0.0 to 15.670 ft in th

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 3.0 ft, (2ND FL)

Point Load : D = 2.0, L = 1.0 k @ 9.580 ft, (2B7)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 3.0 ft, (2ND FL)

Point Load : D = 4.0, L = 1.0 k @ 5.830 ft, (2B6)

Load for Span Number 3

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 9.0 ft, (2ND FL)

Point Load : D = 2.0, L = 1.0 k @ 2.580 ft, (2B7)

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-8**DESIGN SUMMARY****Design OK**

Maximum Bending Stress Ratio = **0.677** : 1
 Section used for this span **Typical Section**
 Mu : Applied -50.062 k-ft
 Mn * Phi : Allowable 73.942 k-ft
 Location of maximum on span 0.000 ft
 Span # where maximum occurs Span # 3

Maximum Deflection

Max Downward Transient Deflection 0.038 in Ratio = **4907** >=360.0 L Only
 Max Upward Transient Deflection -0.008 in Ratio = **17150** >=360.0 L Only
 Max Downward Total Deflection 0.288 in Ratio = **653** >=240.0 Span: 3 : +D+L
 Max Upward Total Deflection -0.044 in Ratio = **3104** >=240.0 Span: 3 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #7 @ d=1.25", 2- #7 @ d=14.75",	73.94	73.94	2,730.67	1,519.16	1,519.16
Section 2 2- #7 @ d=1.25", 2- #7 @ d=14.75",	73.94	73.94	2,730.67	1,519.16	1,519.16
Section 3 2- #7 @ d=1.25", 2- #7 @ d=14.75",	73.94	73.94	2,730.67	1,519.16	1,519.16

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	4.490	11.597	26.402	10.958
Max Upward from Load Combinations	4.490	11.597	26.402	10.958
Max Upward from Load Cases	3.613	8.941	20.647	8.515
D Only	3.613	8.941	20.647	8.515
+D+L	4.490	11.597	26.402	10.958
+D+0.750L	4.270	10.930	24.969	10.345
+0.60D	2.157	5.389	12.374	5.109
L Only	0.968	2.441	5.887	2.435

Shear Stirrup Requirements

Between 0.00 to 0.10 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 0.19 to 9.50 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 9.60 to 14.33 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 14.40 to 20.08 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 20.15 to 32.44 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 32.54 to 37.03 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 37.14 to 41.32 ft, $\Phi V_c < V_u$, Req'd Vs = 2.729, use #3 stirrups spaced at 7.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+L	0.0829	7.125	+D+L	-0.0026	14.480
2	+D+L	0.0112	11.813	+D+L	-0.0445	8.050
3	+D+L	0.2877	8.462		0.0000	8.050

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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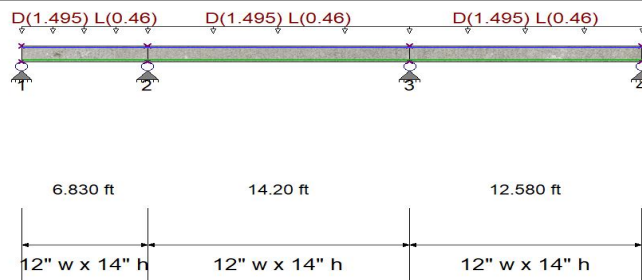
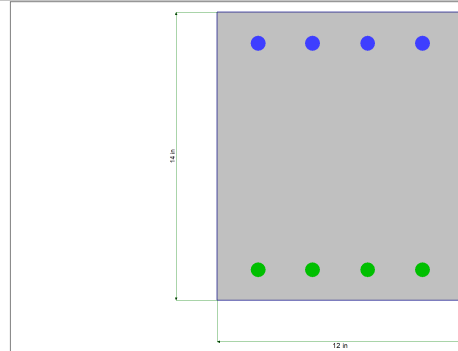
DESCRIPTION: 2B-9 (CRITICAL CONDITION)**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
γ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 14.0 in

Span #1 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 6.830 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 6.830 ft in this :

Span #2 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 14.20 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 14.20 ft in this :

Span #3 Reinforcing....

4-#6 at 1.50 in from Top, from 0.0 to 12.580 ft in this span

4-#6 at 1.50 in from Bottom, from 0.0 to 12.580 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.50 ft, (2ND FL)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.50 ft, (2ND FL)

Load for Span Number 3

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.50 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.592 : 1
Section used for this span		Typical Section
Mu : Applied		-52.960 k-ft
Mn * Phi : Allowable		89.527 k-ft
Location of maximum on span		0.000 ft
Span # where maximum occurs		Span # 3

Maximum Deflection

Max Downward Transient Deflection	0.013 in	Ratio = 11706	>=360.0	L Only
Max Upward Transient Deflection	-0.001 in	Ratio = 77802	>=360.0	L Only
Max Downward Total Deflection	0.096 in	Ratio = 1578	>=240.0	Span: 3 : +D+L
Max Upward Total Deflection	-0.006 in	Ratio = 13931	>=240.0	Span: 3 : +D+L

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-9 (CRITICAL CONDITION)**Cross Section Strength & Inertia**

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in ⁴)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	4- #6 @ d=1.5", 4- #6 @ d=12.5",	89.53	89.53	2,744.00	1,527.83	1,527.83
Section 2	4- #6 @ d=1.5", 4- #6 @ d=12.5",	89.53	89.53	2,744.00	1,527.83	1,527.83
Section 3	4- #6 @ d=1.5", 4- #6 @ d=12.5",	89.53	89.53	2,744.00	1,527.83	1,527.83

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	3.372	25.313	32.476	10.232
Max Upward from Load Combinations	3.372	25.313	32.476	10.232
Max Upward from Load Cases	2.655	19.883	25.298	8.097
D Only	2.655	19.883	25.298	8.097
+D+L	3.372	25.313	32.476	10.232
+D+0.750L	3.190	23.961	30.677	9.700
+0.60D	1.559	11.939	15.249	4.812
L Only	0.738	5.443	7.095	2.185

Shear Stirrup Requirements

Between 0.00 to 4.33 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 4.37 to 11.00 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in
 Between 11.09 to 15.73 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 15.82 to 26.48 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in
 Between 26.57 to 31.09 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 31.18 to 33.53 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.0032	7.114	+D+L	-0.0059	5.054
2	+D+L	0.0808	6.532		0.0000	5.054
3	+D+L	0.0956	7.296		0.0000	5.054

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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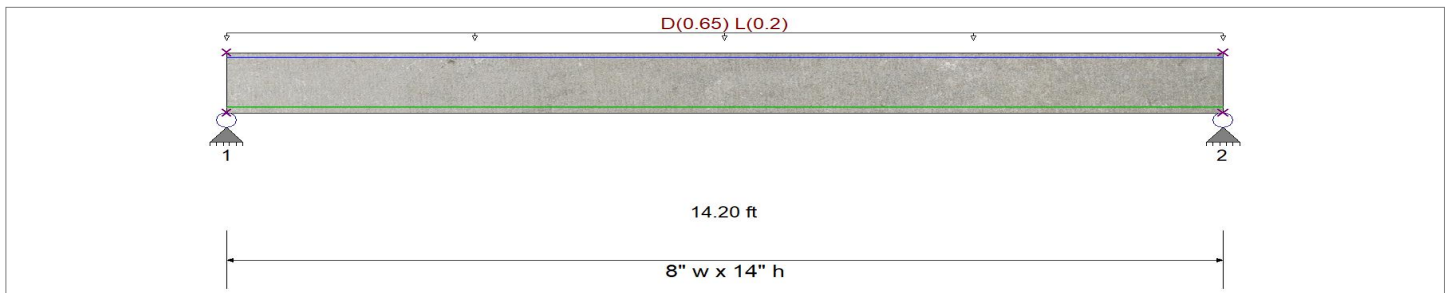
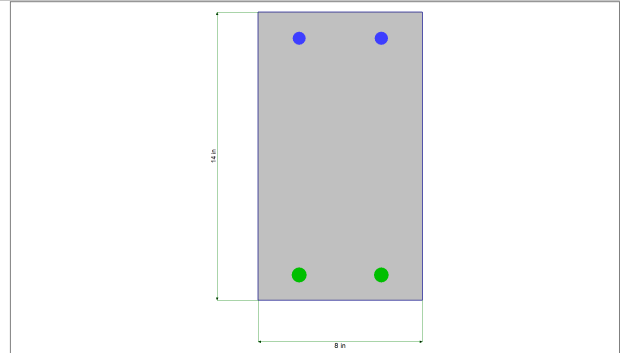
DESCRIPTION: 2B-10**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 14.0 in

Span #1 Reinforcing....

2-#5 at 1.250 in from Top, from 0.0 to 14.20 ft in this span

2-#6 at 1.250 in from Bottom, from 0.0 to 14.20 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 5.0 ft, (2ND FL)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.668 : 1
Section used for this span		Typical Section
Mu : Applied		31.136 k-ft
Mn * Phi : Allowable		46.601 k-ft
Location of maximum on span		7.113 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.032 in	Ratio =	5320	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	L Only
Max Downward Total Deflection	0.319 in	Ratio =	533	>=240.0	Span: 1 : +D+L
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=1.25", 2- #6 @ d=12.75",	46.60	33.28	1,829.33	834.40	640.36

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	6.836	6.836
Max Upward from Load Combinations	6.836	6.836

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-10**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Cases	5.416	5.416
D Only	5.416	5.416
+D+L	6.836	6.836
+D+0.750L	6.481	6.481
+0.60D	3.249	3.249
L Only	1.420	1.420

Shear Stirrup Requirements

Between 0.00 to 3.70 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in
 Between 3.72 to 10.48 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 10.50 to 14.17 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 6.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+L	0.3193	7.100		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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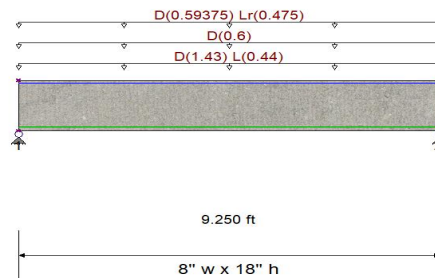
DESCRIPTION: 2B-11**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 18.0 in

Span #1 Reinforcing....

2-#5 at 1.250 in from Top, from 0.0 to 9.250 ft in this span

2-#6 at 1.250 in from Bottom, from 0.0 to 9.250 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.0 ft, (2ND FL)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.775 : 1
Section used for this span		Typical Section
Mu : Applied		48.369 k-ft
Mn * Phi : Allowable		62.441 k-ft
Location of maximum on span		4.633 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.006 in	Ratio =	17225	>=360.0	L Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.109 in	Ratio =	1017	>=240.0	Span: 1 : +D+0.750Lr+0.750L
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+0.750Lr+0.750L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
Cross Section Bar Layout Description		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #5 @ d=1.25", 2- #6 @ d=16.75"	62.44	44.44	3,888.00	1,523.81	1,159.51

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-11**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	15.979	15.979
Max Upward from Load Combinations	15.979	15.979
Max Upward from Load Cases	12.805	12.805
D Only	12.805	12.805
+D+L	14.840	14.840
+D+Lr	15.002	15.002
+D+0.750Lr+0.750L	15.979	15.979
+D+0.750L	14.332	14.332
+0.60D	7.683	7.683
Lr Only	2.197	2.197
L Only	2.035	2.035

Shear Stirrup RequirementsBetween 0.00 to 3.40 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 8.000 inBetween 3.42 to 5.83 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.Between 5.85 to 9.23 ft, $\Phi V_c < V_u$, Req'd Vs = 9.295, use #3 stirrups spaced at 8.000 in**Overall Maximum Deflections**

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+0.750Lr+0.750L	0.1091	4.625		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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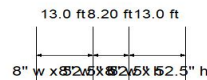
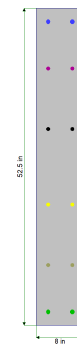
DESCRIPTION: 2B-12**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=		2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 52.50 in

Span #1 Reinforcing....

2-#6 at 2.250 in from Top, from 0.0 to 13.0 ft in this span

2-#5 at 10.0 in from Top, from 0.0 to 13.0 ft in this span

2-#5 at 20.0 in from Bottom, from 0.0 to 13.0 ft in this span

2-#6 at 2.250 in from Bottom, from 0.0 to 13.0 ft in this span

2-#5 at 20.0 in from Top, from 0.0 to 13.0 ft in this span

2-#5 at 10.0 in from Bottom, from 0.0 to 13.0 ft in this span

Span #2 Reinforcing....

2-#6 at 2.250 in from Top, from 0.0 to 8.20 ft in this span

2-#5 at 10.0 in from Top, from 0.0 to 8.20 ft in this span

2-#5 at 20.0 in from Bottom, from 0.0 to 8.20 ft in this span

2-#6 at 2.250 in from Bottom, from 0.0 to 8.20 ft in this span

2-#5 at 20.0 in from Top, from 0.0 to 8.20 ft in this span

2-#5 at 10.0 in from Bottom, from 0.0 to 8.20 ft in this span

Span #3 Reinforcing....

2-#6 at 2.250 in from Top, from 0.0 to 13.0 ft in this span

2-#5 at 10.0 in from Top, from 0.0 to 13.0 ft in this span

2-#5 at 20.0 in from Bottom, from 0.0 to 13.0 ft in this span

2-#6 at 2.250 in from Bottom, from 0.0 to 13.0 ft in this span

2-#5 at 20.0 in from Top, from 0.0 to 13.0 ft in this span

2-#5 at 10.0 in from Bottom, from 0.0 to 13.0 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.0 ft, (2ND FL)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 7.750 ft, (LOW ROOF)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (HIGH ROOF)

Load for Span Number 2

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.0 ft, (2ND FL)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 7.750 ft, (LOW ROOF)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (HIGH ROOF)

Load for Span Number 3

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 11.0 ft, (2ND FL)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 7.750 ft, (LOW ROOF)

Concrete Beam

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-12**Applied Loads**

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

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (HIGH ROOF)

DESIGN SUMMARY**Design OK****Maximum Bending Stress Ratio = 0.182 : 1**

Section used for this span **Typical Section**
 Mu : Applied 79.413 k-ft
 Mn * Phi : Allowable 436.882 k-ft
 Location of maximum on span 7.540 ft
 Span # where maximum occurs Span # 3

Maximum Deflection

Max Downward Transient Deflection 0.000 in Ratio = 0 < 360.0 L Only
 Max Upward Transient Deflection 0.000 in Ratio = 0 < 360.0 Lr Only
 Max Downward Total Deflection 0.005 in Ratio = 29261 >= 240.0 Span: 3 : +D+0.750Lr+0.750L
 Max Upward Total Deflection -0.001 in Ratio = 76861 >= 240.0 Span: 3 : +D+0.750Lr+0.750L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #6 @ d=2.25", 2- #6 @ d=50.25", 2- #5 @ d=10", 2- #5 @	436.88	436.88	96,468.75	25,427.51	25,427.51
Section 2	2- #6 @ d=2.25", 2- #6 @ d=50.25", 2- #5 @ d=10", 2- #5 @	436.88	436.88	96,468.75	25,427.51	25,427.51
Section 3	2- #6 @ d=2.25", 2- #6 @ d=50.25", 2- #5 @ d=10", 2- #5 @	436.88	436.88	96,468.75	25,427.51	25,427.51

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3	Support 4
Max Upward from all Load Conditions	22.056	47.078	47.078	22.056
Max Upward from Load Combinations	22.056	47.078	47.078	22.056
Max Upward from Load Cases	17.678	37.733	37.733	17.678
D Only	17.678	37.733	37.733	17.678
+D+L	20.078	42.857	42.857	20.078
+D+Lr	21.115	45.069	45.069	21.115
+D+0.750Lr+0.750L	22.056	47.078	47.078	22.056
+D+0.750L	19.478	41.576	41.576	19.478
+0.60D	10.607	22.640	22.640	10.607
Lr Only	3.437	7.336	7.336	3.437
L Only	2.400	5.124	5.124	2.400

Shear Stirrup Requirements

Between 0.00 to 2.77 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 20.000 in
 Between 2.86 to 8.06 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 8.15 to 14.37 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 20.000 in
 Between 14.42 to 19.78 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 19.83 to 26.05 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 20.000 in
 Between 26.14 to 31.34 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 31.43 to 34.11 ft, $\Phi V_c < V_u$, Req'd Vs = 0.2318, use #3 stirrups spaced at 20.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+0.750Lr+0.750L	0.0053	5.980	+D+0.750Lr+0.750L	-0.0001	13.164
2	+D+0.750Lr+0.750L	0.0002	8.460	+D+0.750Lr+0.750L	-0.0013	4.100
3	+D+0.750Lr+0.750L	0.0053	7.020		0.0000	4.100

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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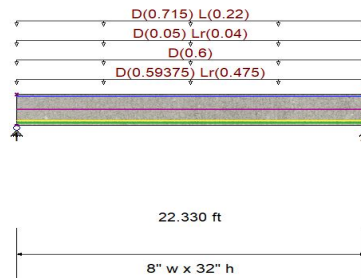
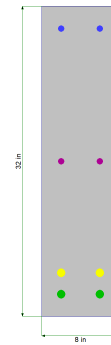
DESCRIPTION: 2B-13**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 32.0 in

Span #1 Reinforcing....

2-#5 at 2.30 in from Top, from 0.0 to 22.330 ft in this span

2-#5 at 16.0 in from Top, from 0.0 to 22.330 ft in this span

2-#7 at 2.30 in from Bottom, from 0.0 to 22.330 ft in this

2-#7 at 4.50 in from Bottom, from 0.0 to 22.330 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (ROOF)

Uniform Load : D = 0.060 ksf, Tributary Width = 10.0 ft, (WALL)

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 2.0 ft, (LOW ROOF)

Uniform Load : D = 0.130, L = 0.040 ksf, Tributary Width = 5.50 ft, (2ND FL)

DESIGN SUMMARY**Design OK****Maximum Bending Stress Ratio = 0.749 : 1**

Section used for this span

Typical Section

Mu : Applied 230.854 k-ft

Mn * Phi : Allowable 308.416 k-ft

Location of maximum on span 11.145 ft

Span # where maximum occurs Span # 1

Maximum Deflection

Max Downward Transient Deflection 0.042 in Ratio = 6345 >=360.0 L Only

Max Upward Transient Deflection 0.000 in Ratio = 0 <360.0 Lr Only

Max Downward Total Deflection 0.446 in Ratio = 601 >=240.0 Span: 1 : +D+0.750Lr+0.750L

Max Upward Total Deflection 0.000 in Ratio = 0 <240.0 Span: 1 : +D+0.750Lr+0.750L

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Cross Section Bar Layout Description						
Section 1	2- #5 @ d=2.3", 2- #7 @ d=29.7", 2- #5 @ d=16", 2- #7 @ c	308.42	122.39	21,845.33	10,917.48	4,545.28

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: 2B-13**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	30.902	30.902
Max Upward from Load Combinations	30.902	30.902
Max Upward from Load Cases	24.748	24.748
D Only	24.748	24.748
+D+L	27.204	27.204
+D+Lr	30.498	30.498
+D+0.750Lr+0.750L	30.902	30.902
+D+0.750L	26.590	26.590
+0.60D	14.849	14.849
Lr Only	5.750	5.750
L Only	2.456	2.456

Shear Stirrup Requirements

Between 0.00 to 6.02 ft, $\Phi V_c < V_u$, Req'd Vs = 0.07515, use #3 stirrups spaced at 12.000 in
Between 6.06 to 8.62 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 14.000 in
Between 8.66 to 13.67 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
Between 13.71 to 16.27 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 14.000 in
Between 16.31 to 22.29 ft, $\Phi V_c < V_u$, Req'd Vs = 22.333, use #3 stirrups spaced at 12.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+0.750Lr+0.750L	0.4457	11.165		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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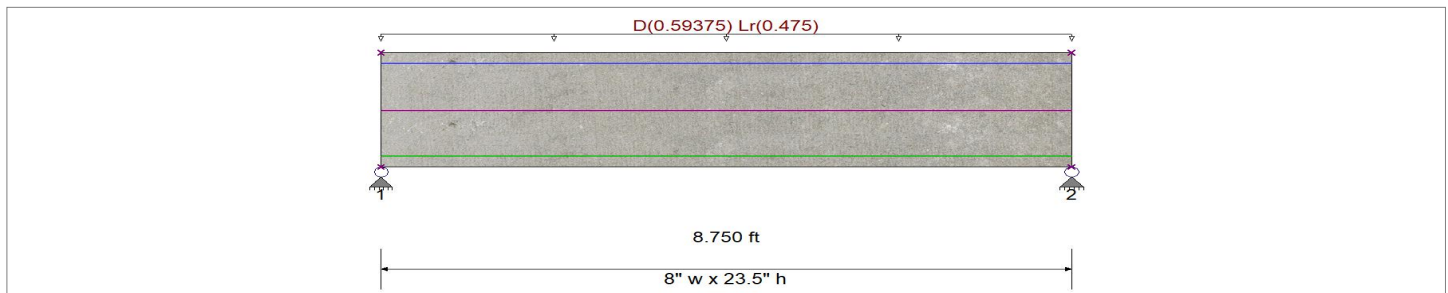
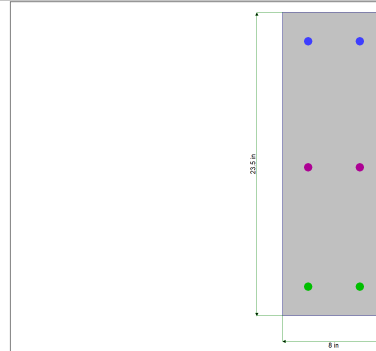
DESCRIPTION: RB-1 (CRITICAL CONDITION)**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
f_y - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 23.50 in

Span #1 Reinforcing....

2-#5 at 2.250 in from Top, from 0.0 to 8.750 ft in this span

2-#5 at 2.250 in from Bottom, from 0.0 to 8.750 ft in this

2-#5 at 11.50 in from Bottom, from 0.0 to 8.750 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.750 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.194 : 1
Section used for this span		Typical Section
Mu : Applied		16.266 k-ft
Mn * Phi : Allowable		83.830 k-ft
Location of maximum on span		4.367 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.002 in	Ratio = 45286	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio = 0	<360.0	Lr Only
Max Downward Total Deflection	0.006 in	Ratio = 17098	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio = 0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.25", 2- #5 @ d=21.25", 2- #5 @ d=12",	83.83	82.44	8,651.92	2,168.39	2,131.33

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	5.504	5.504

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: RB-1 (CRITICAL CONDITION)**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Combinations	5.504	5.504
Max Upward from Load Cases	3.426	3.426
D Only	3.426	3.426
+D+Lr	5.504	5.504
+D+0.750Lr	4.984	4.984
+0.60D	2.056	2.056
Lr Only	2.078	2.078

Shear Stirrup Requirements

Between 0.00 to 0.97 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 8.000 in
 Between 0.99 to 7.76 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 7.78 to 8.73 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 8.000 in

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+Lr	0.0061	4.375		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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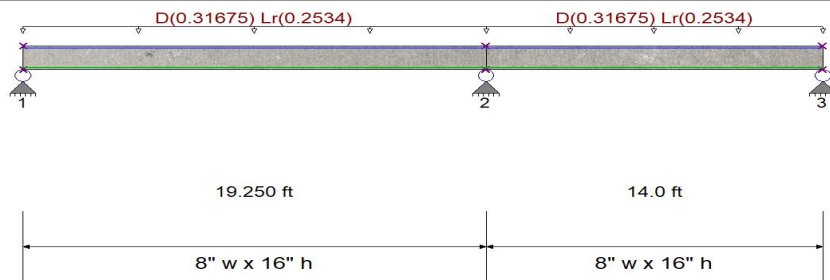
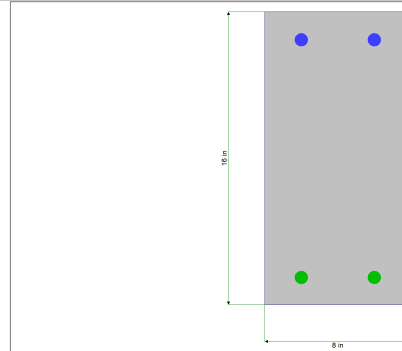
DESCRIPTION: RB-1 (2 SPANS)**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
γ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 16.0 in

Span #1 Reinforcing....

2-#6 at 1.50 in from Top, from 0.0 to 19.250 ft in this span

2-#6 at 1.50 in from Bottom, from 0.0 to 19.250 ft in this

Span #2 Reinforcing....

2-#6 at 1.50 in from Top, from 0.0 to 14.0 ft in this span

2-#6 at 1.50 in from Bottom, from 0.0 to 14.0 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 12.670 ft, (ROOF)

Load for Span Number 2

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 12.670 ft, (ROOF)

DESIGN SUMMARY**Design OK****Maximum Bending Stress Ratio = 0.657 : 1**

Section used for this span

Typical Section

Mu : Applied

-34.913 k-ft

Mn * Phi : Allowable

53.172 k-ft

Location of maximum on span

0.000 ft

Span # where maximum occurs

Span # 2

Maximum Deflection

Max Downward Transient Deflection 0.048 in Ratio = 4771 >=360.0 Lr Only

Max Upward Transient Deflection -0.003 in Ratio = 58804 >=360.0 Lr Only

Max Downward Total Deflection 0.256 in Ratio = 903 >=240.0 Span: 2 : +D+Lr

Max Upward Total Deflection -0.013 in Ratio = 13134 >=240.0 Span: 2 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description		Phi*Mn (k-ft)		Moment of Inertia (in^4)		
		Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1	2- #6 @ d=1.5", 2- #6 @ d=14.5",	53.17	53.17	2,730.67	1,117.20	1,117.20
Section 2	2- #6 @ d=1.5", 2- #6 @ d=14.5",	53.17	53.17	2,730.67	1,117.20	1,117.20

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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DESCRIPTION: RB-1 (2 SPANS)**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	5.405	14.764	3.074
Max Upward from Load Combinations	5.405	14.764	3.074
Max Upward from Load Cases	3.465	9.366	1.986
D Only	3.465	9.366	1.986
+D+Lr	5.405	14.764	3.074
+D+0.750Lr	4.921	13.412	2.803
+0.60D	2.058	5.670	1.162
Lr Only	1.950	5.374	1.102

Shear Stirrup Requirements

Between 0.00 to 2.51 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 2.59 to 12.81 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 12.89 to 23.19 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 23.25 to 33.19 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in) in Span	Location (ft)	Load Combination	Max. "+" Defl (in) in Span	Location (ft)
1	+D+Lr	0.2555	8.525	+D+Lr	-0.0027	19.450
2	+D+Lr	0.0095	9.800	+D+Lr	-0.0128	1.800

Concrete Beam

Project File: MILO.ec6

LIC# : KW-06017089, Build:20.24.08.01

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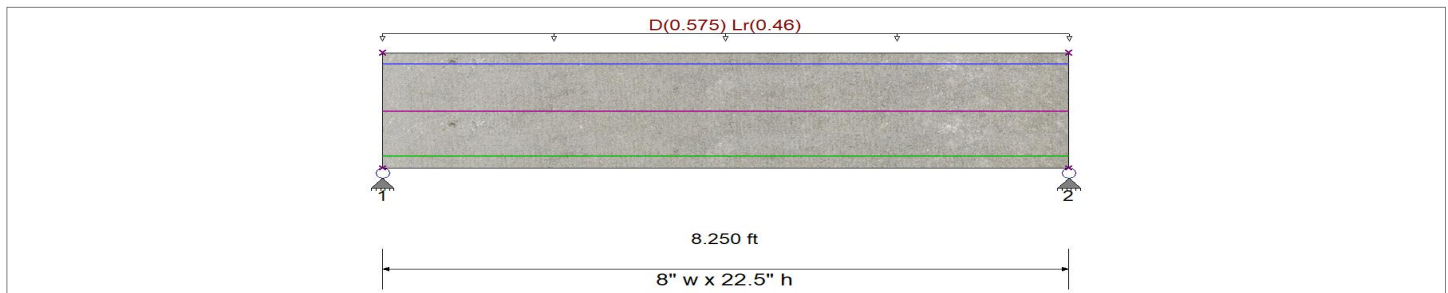
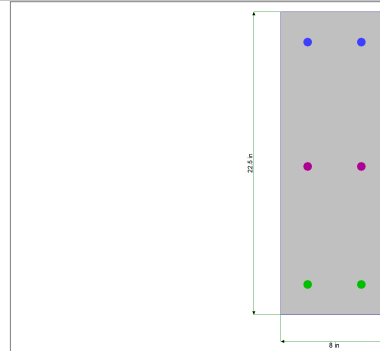
DESCRIPTION: RB-2 (CRITICAL LOAD)**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} \cdot 7.50$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
		Number of Resisting Legs Per Stirrup	=	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 8.0 in, Height = 22.50 in

Span #1 Reinforcing....

2-#5 at 2.250 in from Top, from 0.0 to 8.250 ft in this span
 2-#5 at 11.0 in from Bottom, from 0.0 to 8.250 ft in this span

2-#5 at 2.250 in from Bottom, from 0.0 to 8.250 ft in this

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 23.0 ft, (ROOF)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.176 : 1
Section used for this span		Typical Section
Mu : Applied		13.983 k-ft
Mn * Phi : Allowable		79.645 k-ft
Location of maximum on span		4.133 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.002 in	Ratio = 48967	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio = 0	<360.0	Lr Only
Max Downward Total Deflection	0.005 in	Ratio = 18520	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio = 0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.25", 2- #5 @ d=20.25", 2- #5 @ d=11.5",	79.65	78.25	7,593.75	1,952.72	1,917.70

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	5.017	5.017

Concrete Beam

Project File: MILO.ec6

LIC# : KW-06017089, Build:20.24.08.01

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DESCRIPTION: RB-2 (CRITICAL LOAD)**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Combinations	5.017	5.017
Max Upward from Load Cases	3.120	3.120
D Only	3.120	3.120
+D+Lr	5.017	5.017
+D+0.750Lr	4.543	4.543
+0.60D	1.872	1.872
Lr Only	1.897	1.898

Shear Stirrup Requirements

Between 0.00 to 0.75 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in
 Between 0.77 to 7.48 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 7.50 to 8.23 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 7.000 in

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
+D+Lr	1	0.0053	4.125		0.0000	0.000

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

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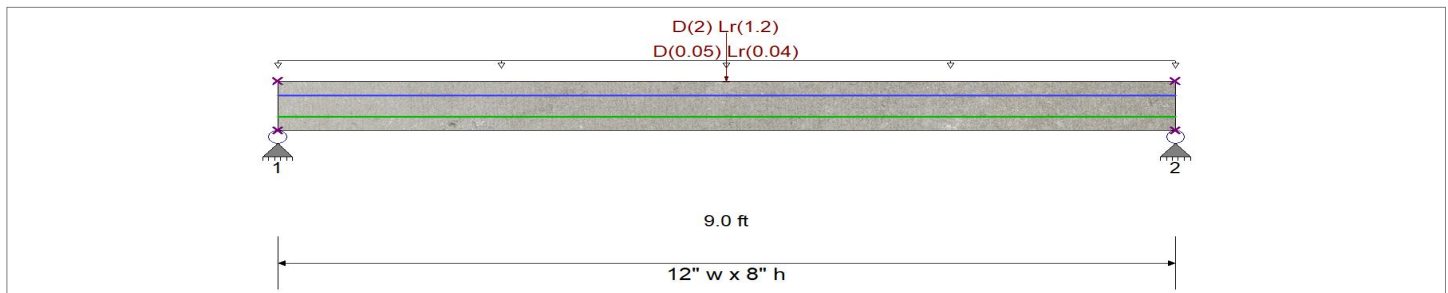
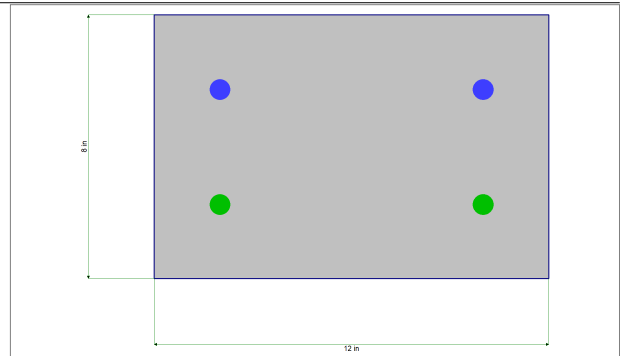
DESCRIPTION: RKB-2**CODE REFERENCES**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combination Set : ASCE 7-16

General Information

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = 7.5 * \lambda * f'_c^{1/2}$	=	410.792 psi		Shear :	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	60.0 ksi
fy - Main Rebar	=	60.0	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 12.0 in, Height = 8.0 in

Span #1 Reinforcing....

2-#5 at 2.250 in from Top, from 0.0 to 9.0 ft in this span

2-#5 at 2.250 in from Bottom, from 0.0 to 9.0 ft in this span

Beam self weight calculated and added to loads**Load for Span Number 1**

Uniform Load : D = 0.0250, Lr = 0.020 ksf, Tributary Width = 2.0 ft, (ROOF)

Point Load : D = 2.0, Lr = 1.20 k @ 4.50 ft, (RIDGE BEAM)

DESIGN SUMMARY**Design OK**

Maximum Bending Stress Ratio	=	0.805 : 1
Section used for this span		Typical Section
Mu : Applied		12.132 k-ft
Mn * Phi : Allowable		15.063 k-ft
Location of maximum on span		4.508 ft
Span # where maximum occurs		Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.023 in	Ratio =	4617	>=360.0	Lr Only
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360.0	Lr Only
Max Downward Total Deflection	0.198 in	Ratio =	544	>=240.0	Span: 1 : +D+Lr
Max Upward Total Deflection	0.000 in	Ratio =	0	<240.0	Span: 1 : +D+Lr

Cross Section Strength & Inertia

Top & Bottom references are for tension side of sect

Cross Section Bar Layout Description	Phi*Mn (k-ft)		Moment of Inertia (in^4)		
	Bottom	Top	I gross	Icr - Bottom	Icr - Top
Section 1 2- #5 @ d=2.25", 2- #5 @ d=5.75",	15.06	15.06	512.00	113.35	113.35

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.440	2.440

Concrete Beam

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: RKB-2**Vertical Reactions**

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Max Upward from Load Combinations	2.440	2.440
Max Upward from Load Cases	1.660	1.660
D Only	1.660	1.660
+D+Lr	2.440	2.440
+D+0.750Lr	2.245	2.245
+0.60D	0.996	0.996
Lr Only	0.780	0.780

Shear Stirrup Requirements

Between 0.00 to 0.72 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 0.74 to 1.59 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 2.000 in
 Between 1.61 to 7.39 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.
 Between 7.41 to 8.26 ft, $\Phi V_c / 2 < V_u \leq \Phi V_c$, Req'd Vs = Min per 9.6.3.1, use #3 stirrups spaced at 2.000 in
 Between 8.28 to 8.98 ft, $V_u < \Phi V_c / 2$, Req'd Vs = Not Req'd per 9.6.3.1, Stirrups are not required.

Overall Maximum Deflections

Span	Load Combination	Max. "-" Defl (in)	Location in Span (ft)	Load Combination	Max. "+" Defl (in)	Location in Span (ft)
1	+D+Lr	0.1985	4.500		0.0000	0.000

Steel Column

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC2 @ 2B-6 (CRITICAL LOADING) KITCHEN**Code References**

Calculations per AISC 360-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

General Information

Steel Section Name :	HSS4x4x1/2	Overall Column Height	13.50 ft
Analysis Method :	Allowable Strength	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade		Brace condition :	
Fy : Steel Yield	36.0 ksi	Unbraced Length for buckling ABOUT X-X Axis = 13.50 ft, K = 1.0	
E : Elastic Bending Modulus	29,000.0 ksi	Unbraced Length for buckling ABOUT Y-Y Axis = 13.50 ft, K = 1.0	

Applied Loads

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

Column self weight included : 290.227 lbs * Dead Load Factor

AXIAL LOADS . . .

2B-6 SUPPORT 5: Axial Load at 13.50 ft, D = 37.310, L = 10.980 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio =	0.750 : 1	Maximum Load Reactions . .	
Load Combination	+D+L	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	0.0 k
Pa : Axial	48.580 k	Bottom along Y-Y	0.0 k
Pn / Omega : Allowable	64.770 k	Maximum Load Deflections . . .	
Ma-x : Applied	0.0 k-ft	Along Y-Y	0.0 in at 0.0ft above base
Mn-x / Omega : Allowable	13.832 k-ft	for load combination :	
Ma-y : Applied	0.0 k-ft	Along X-X	0.0 in at 0.0ft above base
Mn-y / Omega : Allowable	13.832 k-ft	for load combination :	
PASS Maximum Shear Stress Ratio	0.0 : 1		
Load Combination	0.0		
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	0.0 k		
Vn / Omega : Allowable	0.0 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios								Maximum Shear Ratios			
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry		Stress Ratio	Status	Location	
D Only	0.581	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	
+D+L	0.750	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	
+D+0.750L	0.708	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	
+0.60D	0.348	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base @ Top	k	Y-Y Axis Reaction @ Base @ Top	Mx - End Moments @ Base @ Top	k-ft	My - End Moments @ Base @ Top
D Only	37.600						
+D+L	48.580						
+D+0.750L	45.835						
+0.60D	22.560						
L Only	10.980						

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base @ Top	k	Y-Y Axis Reaction @ Base @ Top	Mx - End Moments @ Base @ Top	k-ft	My - End Moments @ Base @ Top
Axial @ Base	Maximum	48.580						
"	Minimum	10.980						
Reaction, X-X Axis Base	Maximum	37.600						
"	Minimum	37.600						

Steel Column

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC2 @ 2B-6 (CRITICAL LOADING) KITCHEN**Extreme Reactions**

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Reaction, Y-Y Axis Base	Maximum	37.600										
"	Minimum	37.600										
Reaction, X-X Axis Top	Maximum	37.600										
"	Minimum	37.600										
Reaction, Y-Y Axis Top	Maximum	37.600										
"	Minimum	37.600										
Moment, X-X Axis Base	Maximum	37.600										
"	Minimum	37.600										
Moment, Y-Y Axis Base	Maximum	37.600										
"	Minimum	37.600										
Moment, X-X Axis Top	Maximum	37.600										
"	Minimum	37.600										
Moment, Y-Y Axis Top	Maximum	37.600										
"	Minimum	37.600										

Maximum Deflections for Load Combinations

Load Combination	Max. Deflection in X dir	Distance	Max. Deflection in Y dir	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : HSS4x4x1/2

Depth	=	4.000 in	I xx	=	11.90 in^4	J	=	21.000 in^4
Design Thick	=	0.465 in	S xx	=	5.97 in^3			
Width	=	4.000 in	R xx	=	1.410 in			
Wall Thick	=	0.500 in	Zx	=	7.700 in^3			
Area	=	6.020 in^2	I yy	=	11.900 in^4	C	=	11.200 in^3
Weight	=	21.498 plf	S yy	=	5.970 in^3			
			R yy	=	1.410 in			
Ycg	=	0.000 in						

Steel Column

Project File: MILO - 041525.ec6

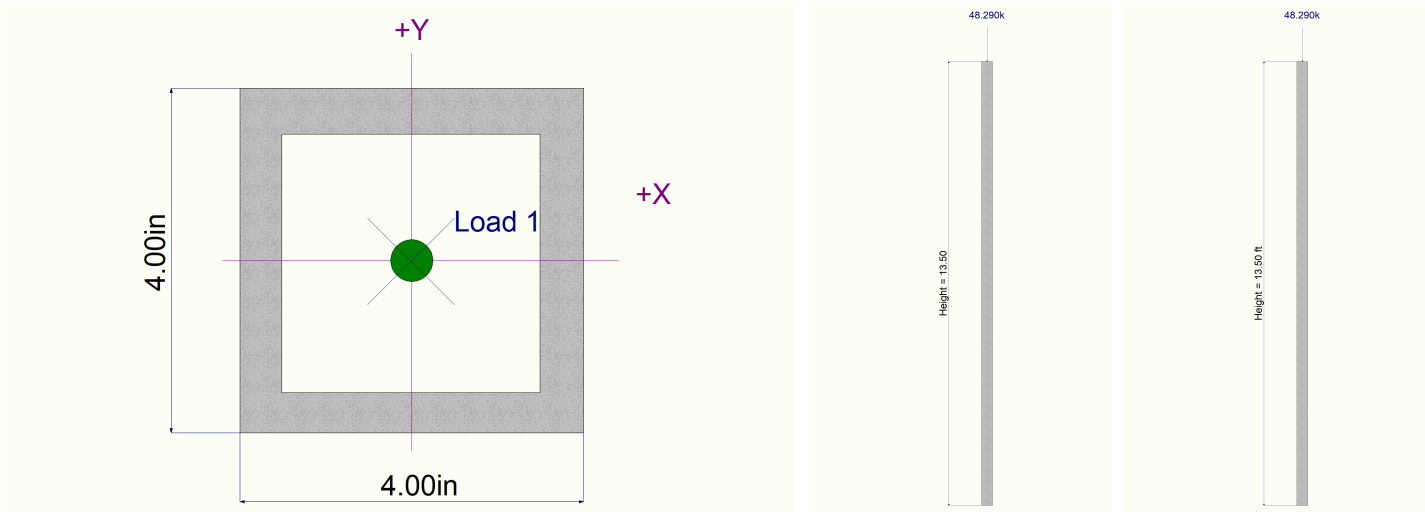
LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC2 @ 2B-6 (CRITICAL LOADING) KITCHEN

Sketches



Steel Column

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC2 @ 2B-6/2B-5/2B-4 - KITCHEN ENTRY HALL**Code References**

Calculations per AISC 360-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

General Information

Steel Section Name : **HSS4x4x1/2**
 Analysis Method : Allowable Strength
 Steel Stress Grade
 Fy : Steel Yield 36.0 ksi
 E : Elastic Bending Modulus 29,000.0 ksi

Overall Column Height 13.50 ft
 Top & Bottom Fixity Top & Bottom Pinned
 Brace condition :
 Unbraced Length for buckling ABOUT X-X Axis = 13.50 ft, K = 1.0
 Unbraced Length for buckling ABOUT Y-Y Axis = 13.50 ft, K = 1.0

Applied Loads

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

Column self weight included : 290.227 lbs * Dead Load Factor

AXIAL LOADS . . .

2B-6/2B-5/2B4: Axial Load at 13.50 ft, D = 31.740, L = 8.230 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio =	0.6216 : 1	Maximum Load Reactions . .	
Load Combination	+D+L	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	0.0 k
Pa : Axial	40.260 k	Bottom along Y-Y	0.0 k
Pn / Omega : Allowable	64.770 k		
Ma-x : Applied	0.0 k-ft	Maximum Load Deflections . . .	
Mn-x / Omega : Allowable	13.832 k-ft	Along Y-Y	0.0 in at 0.0ft above base
Ma-y : Applied	0.0 k-ft	for load combination :	
Mn-y / Omega : Allowable	13.832 k-ft	Along X-X	0.0 in at 0.0ft above base
		for load combination :	
PASS Maximum Shear Stress Ratio	0.0 : 1		
Load Combination	0.0		
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	0.0 k		
Vn / Omega : Allowable	0.0 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios								Maximum Shear Ratios			
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry		Stress Ratio	Status	Location	
D Only	0.495	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	
+D+L	0.622	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	
+D+0.750L	0.590	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	
+0.60D	0.297	PASS	0.00 ft	1.00	1.00	114.89	114.89		0.000	PASS	0.00 ft	

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base @ Top	k	Y-Y Axis Reaction @ Base @ Top	Mx - End Moments @ Base @ Top	k-ft	My - End Moments @ Base @ Top
D Only	32.030						
+D+L	40.260						
+D+0.750L	38.203						
+0.60D	19.218						
L Only	8.230						

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base @ Top	k	Y-Y Axis Reaction @ Base @ Top	Mx - End Moments @ Base @ Top	k-ft	My - End Moments @ Base @ Top
Axial @ Base	Maximum	40.260						
"	Minimum	8.230						
Reaction, X-X Axis Base	Maximum	32.030						
"	Minimum	32.030						

Steel Column

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC2 @ 2B-6/2B-5/2B-4 - KITCHEN ENTRY HALL**Extreme Reactions**

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Reaction, Y-Y Axis Base	Maximum	32.030										
"	Minimum	32.030										
Reaction, X-X Axis Top	Maximum	32.030										
"	Minimum	32.030										
Reaction, Y-Y Axis Top	Maximum	32.030										
"	Minimum	32.030										
Moment, X-X Axis Base	Maximum	32.030										
"	Minimum	32.030										
Moment, Y-Y Axis Base	Maximum	32.030										
"	Minimum	32.030										
Moment, X-X Axis Top	Maximum	32.030										
"	Minimum	32.030										
Moment, Y-Y Axis Top	Maximum	32.030										
"	Minimum	32.030										

Maximum Deflections for Load Combinations

Load Combination	Max. Deflection in X dir	Distance	Max. Deflection in Y dir	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : HSS4x4x1/2

Depth	=	4.000 in	I xx	=	11.90 in^4	J	=	21.000 in^4
Design Thick	=	0.465 in	S xx	=	5.97 in^3			
Width	=	4.000 in	R xx	=	1.410 in			
Wall Thick	=	0.500 in	Zx	=	7.700 in^3			
Area	=	6.020 in^2	I yy	=	11.900 in^4	C	=	11.200 in^3
Weight	=	21.498 plf	S yy	=	5.970 in^3			
			R yy	=	1.410 in			
Ycg	=	0.000 in						

Steel Column

Project File: MILO - 041525.ec6

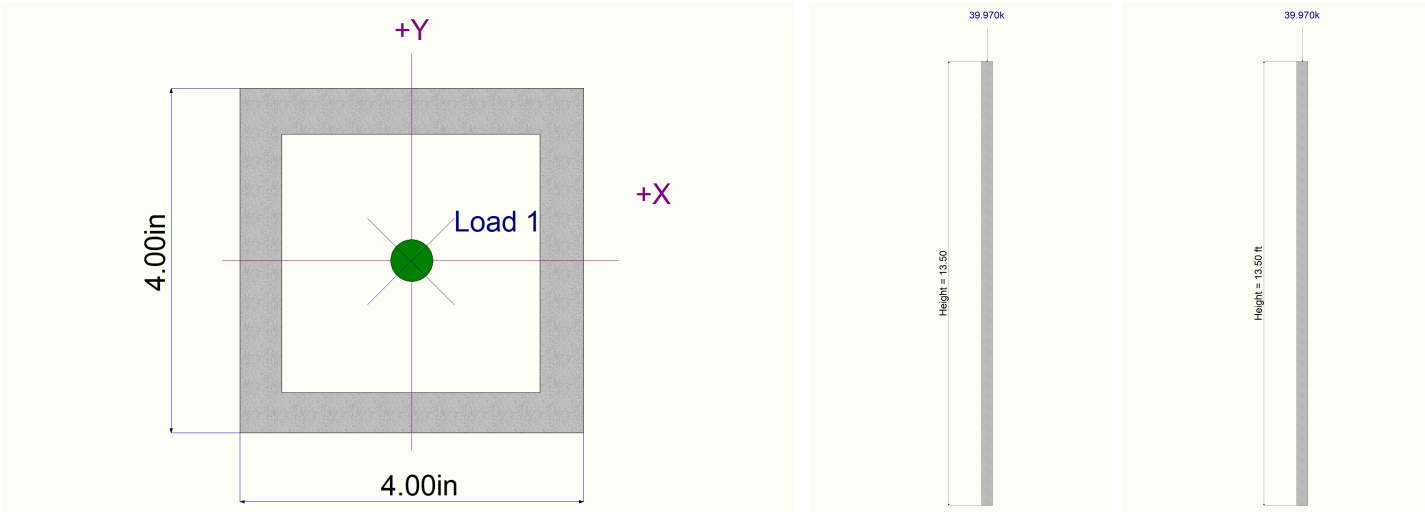
LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC2 @ 2B-6/2B-5/2B-4 - KITCHEN ENTRY HALL

Sketches



Steel Column

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC1 @ 2B-8 MASTER (CRITICAL LOAD)**Code References**

Calculations per AISC 360-16, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

General Information

Steel Section Name :	HSS4x4x3/8	Overall Column Height	13.50 ft
Analysis Method :	Allowable Strength	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade		Brace condition :	
Fy : Steel Yield	36.0 ksi	Unbraced Length for buckling ABOUT X-X Axis =	13.50 ft, K = 1.0
E : Elastic Bending Modulus	29,000.0 ksi	Unbraced Length for buckling ABOUT Y-Y Axis =	13.50 ft, K = 1.0

Applied Loads

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

Column self weight included : 232.166 lbs * Dead Load Factor

AXIAL LOADS . . .

2B-8 SUPPORT 3: Axial Load at 13.50 ft, D = 20.650, L = 5.890 k

DESIGN SUMMARY**Bending & Shear Check Results**

PASS Max. Axial+Bending Stress Ratio =	0.4924 : 1	Maximum Load Reactions . .	
Load Combination	+D+L	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	0.0 k
Pa : Axial	26.772 k	Bottom along Y-Y	0.0 k
Pn / Omega : Allowable	54.368 k	Maximum Load Deflections . . .	
Ma-x : Applied	0.0 k-ft	Along Y-Y	0.0 in at 0.0ft above base
Mn-x / Omega : Allowable	11.479 k-ft	for load combination :	
Ma-y : Applied	0.0 k-ft	Along X-X	0.0 in at 0.0ft above base
Mn-y / Omega : Allowable	11.479 k-ft	for load combination :	
PASS Maximum Shear Stress Ratio	0.0 : 1		
Load Combination	0.0		
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	0.0 k		
Vn / Omega : Allowable	0.0 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios				Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx	KyLy/Ry	Stress Ratio	Status	Location
D Only	0.384	PASS	0.00 ft	1.00	1.00	110.20	110.20	0.000	PASS	0.00 ft
+D+L	0.492	PASS	0.00 ft	1.00	1.00	110.20	110.20	0.000	PASS	0.00 ft
+D+0.750L	0.465	PASS	0.00 ft	1.00	1.00	110.20	110.20	0.000	PASS	0.00 ft
+0.60D	0.230	PASS	0.00 ft	1.00	1.00	110.20	110.20	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction @ Base	X-X Axis Reaction @ Base @ Top	k	Y-Y Axis Reaction @ Base @ Top	Mx - End Moments @ Base @ Top	k-ft	My - End Moments @ Base @ Top
D Only	20.882						
+D+L	26.772						
+D+0.750L	25.300						
+0.60D	12.529						
L Only	5.890						

Extreme Reactions

Item	Extreme Value	Axial Reaction @ Base	X-X Axis Reaction @ Base @ Top	k	Y-Y Axis Reaction @ Base @ Top	Mx - End Moments @ Base @ Top	k-ft	My - End Moments @ Base @ Top
Axial @ Base	Maximum	26.772						
"	Minimum	5.890						
Reaction, X-X Axis Base	Maximum	20.882						
"	Minimum	20.882						

Steel Column

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC1 @ 2B-8 MASTER (CRITICAL LOAD)**Extreme Reactions**

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Reaction, Y-Y Axis Base	Maximum	20.882										
"	Minimum	20.882										
Reaction, X-X Axis Top	Maximum	20.882										
"	Minimum	20.882										
Reaction, Y-Y Axis Top	Maximum	20.882										
"	Minimum	20.882										
Moment, X-X Axis Base	Maximum	20.882										
"	Minimum	20.882										
Moment, Y-Y Axis Base	Maximum	20.882										
"	Minimum	20.882										
Moment, X-X Axis Top	Maximum	20.882										
"	Minimum	20.882										
Moment, Y-Y Axis Top	Maximum	20.882										
"	Minimum	20.882										

Maximum Deflections for Load Combinations

Load Combination	Max. Deflection in X dir	Distance	Max. Deflection in Y dir	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : HSS4x4x3/8

Depth	=	4.000 in	I xx	=	10.30 in^4	J	=	17.500 in^4
Design Thick	=	0.349 in	S xx	=	5.13 in^3			
Width	=	4.000 in	R xx	=	1.470 in			
Wall Thick	=	0.375 in	Zx	=	6.390 in^3			
Area	=	4.780 in^2	I yy	=	10.300 in^4	C	=	9.140 in^3
Weight	=	17.197 plf	S yy	=	5.130 in^3			
			R yy	=	1.470 in			
Ycg	=	0.000 in						

Steel Column

Project File: MILO - 041525.ec6

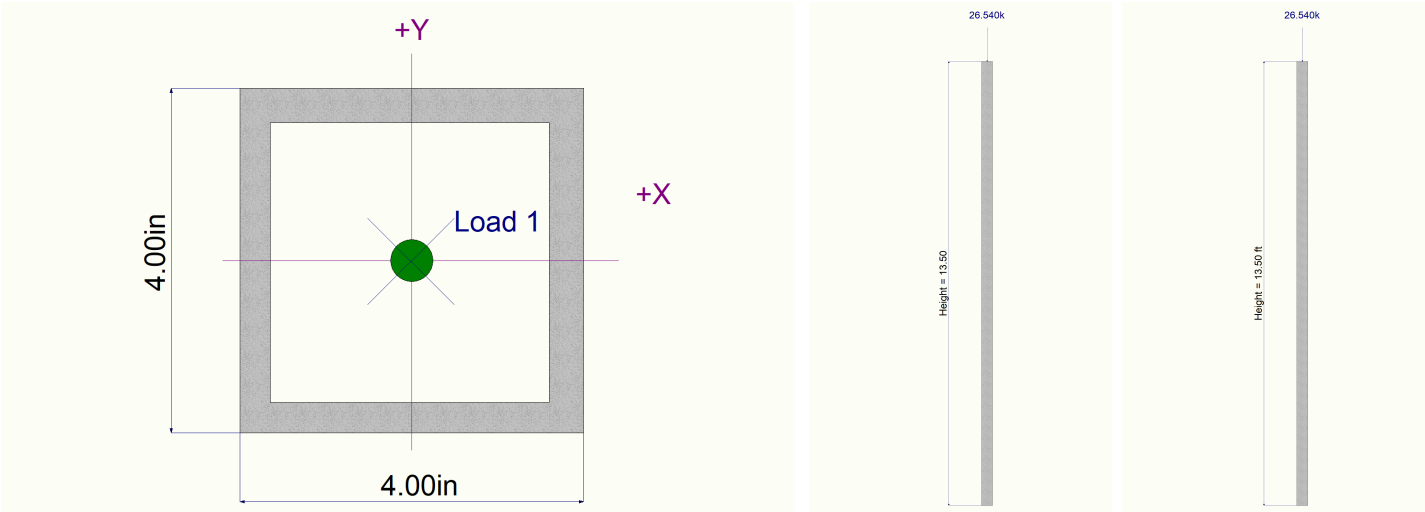
LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: SC1 @ 2B-8 MASTER (CRITICAL LOAD)

Sketches



Steel Base Plate

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17 ALEX KONDRAT & ASSOCIATES INC (c) ENERCALC, LLC 1982-2025

DESCRIPTION: 11X11X3/4 STEEL BASE PLATE 1/4 CRITICAL LOAD @ SC2/2B6

Code Reference:

Calculations per AISC Design Guide # 1, IBC 2018, CBC 2019
Load Combination Set : ASCE 7-22 / IBC 2024 (L<=100psf)

General Information

Material Properties

AISC Design Method	Allowable Strength Design		
Steel Plate Fy	=	36 ksi	
Concrete Support f'c	=	3 ksi	
Assumed Bearing Area	Full Bearing		
		Ω_c : ASD Safety Factor	2.5
		Nominal Bearing Fp per J8	5.10 ksi

Column & Plate

Column Properties

Steel Section	HSS4x4x1/2		
Depth	4 in	Area	6.02 in^2
Width	4 in	Ixx	11.9 in^4
Flange Thickness	0.465 in	Iyy	11.9 in^4
Web Thickness	0 in		

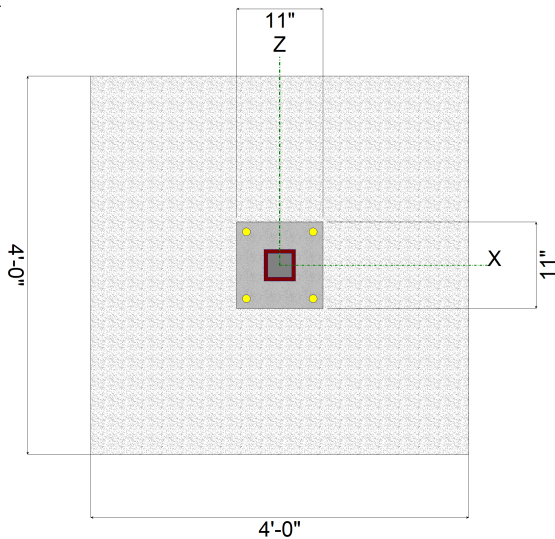
Plate Dimensions

N : Length	11.0 in
B : Width	11.0 in
Thickness	0.750 in

Support Dimensions

Width along "X"	48.0 in
Length along "Z"	48.0 in

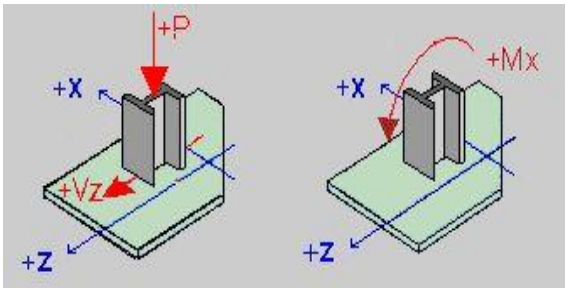
Column assumed welded to base plate



Applied Loads

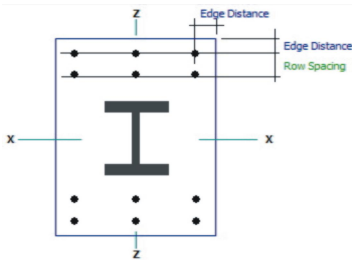
	P-Y	V-Z	M-X
D : Dead Load	37.310 k	k	k-ft
L : Live	10.980 k	k	k-ft
Lr : Roof Live	k	k	k-ft
S : Snow	k	k	k-ft
W : Wind	k	k	k-ft
E : Earthquake	k	k	k-ft
H : Lateral Earth	k	k	k-ft

" P " = Gravity load, "+" sign is downward
" M " = Moments create higher soil pressure at +Z edge
" V " = Shears push plate towards +Z edge



Anchor Bolts

Anchor Bolt or Rod Description 1 1/2"	
Max of Tension or Pullout Capacity.....	k
Shear Capacity.....	k
Edge distance : bolt to plate.....	1.25 in
Number of Bolts in each Row.....	2
Number of Bolt Rows.....	1



Steel Base Plate

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: 11X11X3/4 STEEL BASE PLATE 1/S4 CRTICAL LOAD @ SC2/2B6**GOVERNING DESIGN LOAD CASE SUMMARY****Plate Design Summary**

Design Method **Allowable Strength Design**
 Governing Load Combinat **+D+L**
 Governing Load Case Typ **Axial Load Only**
 Governing STRESS RATIO **0.8531**
 Design Plate Size **11" x 11" x 0 -3/4"**
 Pa : Axial Load 48.29 k
 Ma : Moment 0 k-ft

Ma : Max. Moment 2.586 k-in
 fb : Max. Bending Stress 18.390 ksi
 Fb : Allowable : F_y / Ω 21.557 ksi

Bending Stress Ratio **0.853**
Bending Stress OK

fu : Max. Plate Bearing Stress 0.399 ksi
 Fp : Allowable : 2.040 ksi

Bearing Stress Ratio **0.196**
Bearing Stress OK

Load Comb. : D Only

Axial Load Only, No Moment**Loading**

Pa : Axial Load 37.310 k
 Design Plate Height 11.000 in
 Design Plate Width 11.000 in
Will be different from entry if partial bearing used.
 A1 : Plate Area 121.000 in²
 A2 : Support Area 2,304.000 in²
 sqrt(A2/A1) 2.000

Distance for Moment Calculation

" m " 3.600 in
 " n " 3.600 in
 X 0.000 in²
 Lambda 0.000
 n' 0.000 in
 n' * Lambda 0.000 in
 L = max(m, n, n') 3.600 in

Bearing Stresses

Fp : Allowable 2.040 ksi
 fa : Max. Bearing Pressure 0.308 ksi
Stress Ratio 0.151

Plate Bending Stresses

Mmax = $F_u * L^2 / 2$ 1.998 k-in on 1" strip
 fb : Actual 14.209 ksi
 Fb : Allowable 21.557 ksi
Stress Ratio 0.659

Load Comb. : +D+L

Axial Load Only, No Moment**Loading**

Pa : Axial Load 48.290 k
 Design Plate Height 11.000 in
 Design Plate Width 11.000 in
Will be different from entry if partial bearing used.
 A1 : Plate Area 121.000 in²
 A2 : Support Area 2,304.000 in²
 sqrt(A2/A1) 2.000

Distance for Moment Calculation

" m " 3.600 in
 " n " 3.600 in
 X 0.000 in²
 Lambda 0.000
 n' 0.000 in
 n' * Lambda 0.000 in
 L = max(m, n, n') 3.600 in

Bearing Stresses

Fp : Allowable 2.040 ksi
 fa : Max. Bearing Pressure 0.399 ksi
Stress Ratio 0.196

Plate Bending Stresses

Mmax = $F_u * L^2 / 2$ 2.586 k-in on 1" strip
 fb : Actual 18.390 ksi
 Fb : Allowable 21.557 ksi
Stress Ratio 0.853

Steel Base Plate

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: 11X11X3/4 STEEL BASE PLATE 1/4 CRITICAL LOAD @ SC2/2B6

Load Comb. : +D+0.750L

Axial Load Only, No MomentLoading

Pa : Axial Load 45.545 k
 Design Plate Height 11.000 in
 Design Plate Width 11.000 in
Will be different from entry if partial bearing used.
 A1 : Plate Area 121.000 in²
 A2: Support Area 2,304.000 in²
 sqrt(A2/A1) 2.000

Distance for Moment Calculation

" m " 3.600 in
 " n " 3.600 in
 X 0.000 in²
 Lambda 0.000
 n' 0.000 in
 n' * Lambda 0.000 in
 L = max(m, n, n") 3.600 in

Bearing Stresses

Fp : Allowable 2.040 ksi
 fa : Max. Bearing Pressure 0.376 ksi
Stress Ratio 0.185

Plate Bending Stresses

Mmax = Fu * L² / 2 2.439 k-in on 1" strip
 fb : Actual 17.345 ksi
 Fb : Allowable 21.557 ksi
Stress Ratio 0.805

Load Comb. : +0.60D

Axial Load Only, No MomentLoading

Pa : Axial Load 22.386 k
 Design Plate Height 11.000 in
 Design Plate Width 11.000 in
Will be different from entry if partial bearing used.
 A1 : Plate Area 121.000 in²
 A2: Support Area 2,304.000 in²
 sqrt(A2/A1) 2.000

Distance for Moment Calculation

" m " 3.600 in
 " n " 3.600 in
 X 0.000 in²
 Lambda 0.000
 n' 0.000 in
 n' * Lambda 0.000 in
 L = max(m, n, n") 3.600 in

Bearing Stresses

Fp : Allowable 2.040 ksi
 fa : Max. Bearing Pressure 0.185 ksi
Stress Ratio 0.091

Plate Bending Stresses

Mmax = Fu * L² / 2 1.199 k-in on 1" strip
 fb : Actual 8.525 ksi
 Fb : Allowable 21.557 ksi
Stress Ratio 0.395

Wall Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: WF18 (CRITICAL CONDITION)

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019
Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

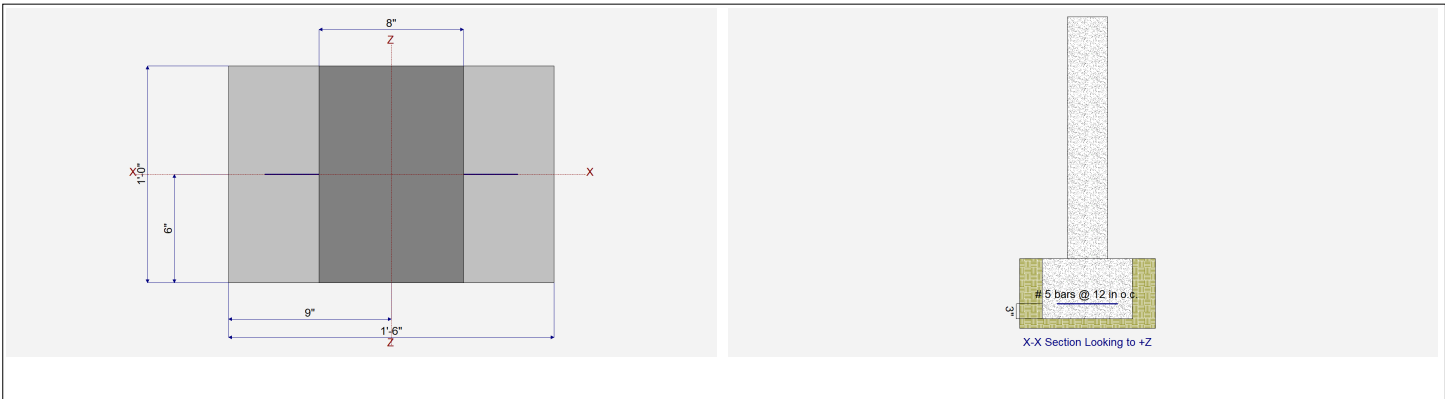
General Information

Material Properties			Soil Design Values		
f'c : Concrete 28 day strength	=	3.0 ksi	Allowable Soil Bearing	=	3.0 ksf
fy : Rebar Yield	=	60.0 ksi	Increase Bearing By Footing Weight	=	No
Ec : Concrete Elastic Modulus	=	3,122.0 ksi	Soil Passive Resistance (for Sliding)	=	250.0 pcf
Concrete Density	=	145.0 pcf	Soil/Concrete Friction Coeff.	=	0.30
φ Values Flexure	=	0.90	Increases based on footing Depth		
Shear	=	0.750	Reference Depth below Surface	=	2.0 ft
Analysis Settings			Allow. Pressure Increase per foot of depth	=	ksf
Min Steel % Bending Reinf.	=		when base footing is below	=	ft
Min Allow % Temp Reinf.	=	0.00180	Increases based on footing Width		
Min. Overturning Safety Factor	=	1.0 : 1	Allow. Pressure Increase per foot of width	=	ksf
Min. Sliding Safety Factor	=	1.0 : 1	when footing is wider than	=	ft
AutoCalc Footing Weight as DL :	=	Yes	Adjusted Allowable Bearing Pressure	=	3.0 ksf

Dimensions

Reinforcing

Footing Width	=	1.50 ft	Footing Thickness	=	12.0 in	Bars along X-X Axis	=	
Wall Thickness	=	8.0 in	Rebar Centerline to Edge of Concrete...	=		Bar spacing	=	12.00
Wall center offset from center of footing	=	0 in	at Bottom of footing =	=	3.0 in	Reinforcing Bar Size	=	# 5



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	1.180	0.320				k
OB : Overburden	=						ksf
V-x	=						k
M-zz	=						k-ft
Vx applied	=						in above top of footing

WF18 (CRITICAL LOAD) GARAGE						
UNFACTORED LOADS	LIVE (PSF)	DEAD (PSF)	ELEMENT SPAN (FT)	TRIB SPAN (FT)	UNIFORM LOAD LIVE (LB/FT)	UNIFORM LOAD DEAD (LB/FT)
ROOF	20	25	32	16	320	400
MASONRY	0	60	13	13	0	780
TOTAL UNIFORM LOAD					320	1180
TOTAL UNIFORM GRAVITY LOAD (D+L)					1500	

Wall Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: WF18 (CRITICAL CONDITION)**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	n/a	Uplift	0.0 k	0.0 k	No Uplift
Utilization Ratio		Item	Applied	Capacity	Governing Load Combination
PASS	0.3817	Soil Bearing	1.145 ksf	3.0 ksf	+D+Lr
PASS	0.01044	Z Flexure (+X)	0.1267 k-ft	12.131 k-ft	+1.20D+1.60Lr
PASS	0.0060	Z Flexure (-X)	0.07279 k-ft	12.131 k-ft	+0.90D
PASS	N/A	1-way Shear (+X)	N/A psi	82.158 psi	N/A
PASS	N/A	1-way Shear (-X)	N/A psi	82.158 psi	N/A

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress		Actual / Allowable Ratio
			-X	+X	
D Only	3.0 ksf	0.0 in	0.9317 ksf	0.9317 ksf	0.311
+D+Lr	3.0 ksf	0.0 in	1.145 ksf	1.145 ksf	0.382
+D+0.750Lr	3.0 ksf	0.0 in	1.092 ksf	1.092 ksf	0.364
+0.60D	3.0 ksf	0.0 in	0.5590 ksf	0.5590 ksf	0.186

Units : k-ft

Overturning Stability

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 Safety Ratio	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	0.1132	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.40D	0.1132	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50Lr	0.1063	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50Lr	0.1063	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D	0.09705	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D	0.09705	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60Lr	0.1267	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60Lr	0.1267	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.07279	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.07279	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

Units : k

One Way Shear

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	82.2 psi	0.000	OK
+1.20D+0.50Lr	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK
+1.20D	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK
+1.20D+1.60Lr	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK
+0.90D	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK

Wall Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: WF24 (CRITICAL CONDITION)

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019
Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

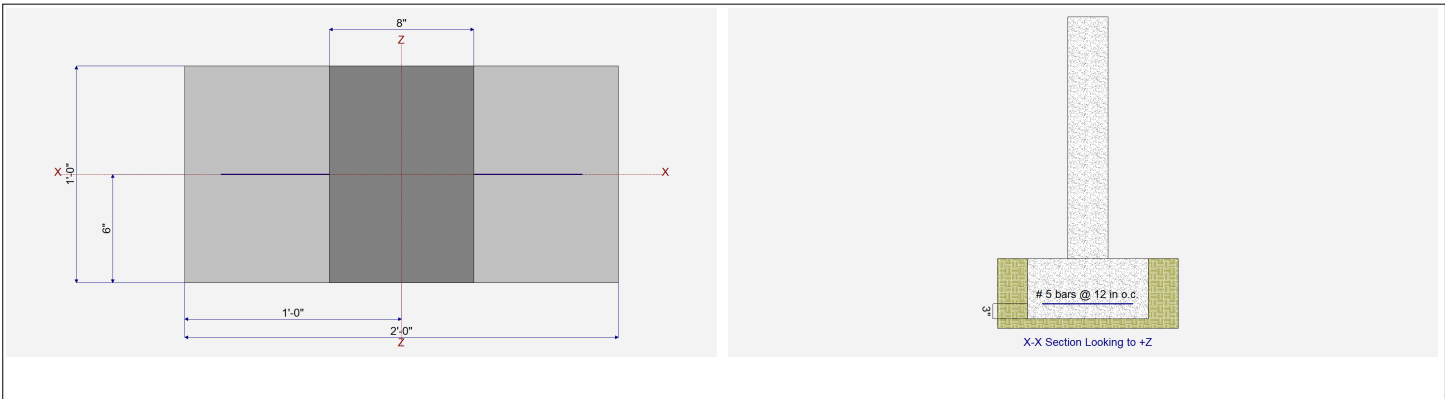
General Information

Material Properties			Soil Design Values		
f'c : Concrete 28 day strength	=	3.0 ksi	Allowable Soil Bearing	=	3.0 ksf
fy : Rebar Yield	=	60.0 ksi	Increase Bearing By Footing Weight	=	No
Ec : Concrete Elastic Modulus	=	3,122.0 ksi	Soil Passive Resistance (for Sliding)	=	250.0 pcf
Concrete Density	=	145.0 pcf	Soil/Concrete Friction Coeff.	=	0.30
φ Values Flexure	=	0.90	Increases based on footing Depth		
Shear	=	0.750	Reference Depth below Surface	=	2.0 ft
Analysis Settings			Allow. Pressure Increase per foot of depth	=	ksf
Min Steel % Bending Reinf.	=		when base footing is below	=	ft
Min Allow % Temp Reinf.	=	0.00180	Increases based on footing Width		
Min. Overturning Safety Factor	=	1.0 : 1	Allow. Pressure Increase per foot of width	=	ksf
Min. Sliding Safety Factor	=	1.0 : 1	when footing is wider than	=	ft
AutoCalc Footing Weight as DL :	=	Yes	Adjusted Allowable Bearing Pressure	=	3.0 ksf

Dimensions

Reinforcing

Footing Width	=	2 ft	Footing Thickness	=	12.0 in	Bars along X-X Axis	
Wall Thickness	=	8.0 in	Rebar Centerline to Edge of Concrete...			Bar spacing	= 12.00
Wall center offset from center of footing	=	0 in	at Bottom of footing =	3.0 in		Reinforcing Bar Size	= # 5



Applied Loads

	D	Lr	L	S	W	E	H
P : Column Load	=	3.0	0.7360				k
OB : Overburden	=						ksf
V-x	=						k
M-zz	=						k-ft
Vx applied	=						in above top of footing

WF24 (CRITICAL LOADING)						
UNFACTORED LOADS	LIVE (PSF)	DEAD (PSF)	ELEMENT SPAN (FT)	TRIB SPAN (FT)	UNIFORM LOAD LIVE (LB/FT)	UNIFORM LOAD DEAD (LB/FT)
ROOF	20	25	43.58+OH	23.8	476	595
MASONRY	0	60	26	26	0	1560
8" 2ND FL SLAB	40	130	15.5	6.5	260	845
TOTAL UNIFORM LOAD					736	3000
TOTAL UNIFORM GRAVITY LOAD (D+L)					3736	

Wall Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: WF24 (CRITICAL CONDITION)**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	n/a	Uplift	0.0 k	0.0 k	No Uplift
Utilization Ratio		Item	Applied	Capacity	Governing Load Combination
PASS	0.6710	Soil Bearing	2.013 ksf	3.0 ksf	+D+Lr
PASS	0.04695	Z Flexure (+X)	0.5695 k-ft	12.131 k-ft	+1.20D+1.60Lr
PASS	0.02712	Z Flexure (-X)	0.3290 k-ft	12.131 k-ft	+0.90D
PASS	N/A	1-way Shear (+X)	N/A psi	82.158 psi	N/A
PASS	N/A	1-way Shear (-X)	N/A psi	82.158 psi	N/A

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc	Actual Soil Bearing Stress		Actual / Allowable Ratio
			-X	+X	
D Only	3.0 ksf	0.0 in	1.645 ksf	1.645 ksf	0.548
+D+Lr	3.0 ksf	0.0 in	2.013 ksf	2.013 ksf	0.671
+D+0.750Lr	3.0 ksf	0.0 in	1.921 ksf	1.921 ksf	0.640
+0.60D	3.0 ksf	0.0 in	0.9870 ksf	0.9870 ksf	0.329

Units : k-ft

Overturning Stability

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 Safety Ratio	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	0.5118	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.40D	0.5118	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50Lr	0.4796	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+0.50Lr	0.4796	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D	0.4387	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D	0.4387	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60Lr	0.5695	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+1.20D+1.60Lr	0.5695	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.329	-X	Bottom	0.2592	Min Temp %	0.31	12.131	OK
+0.90D	0.329	+X	Bottom	0.2592	Min Temp %	0.31	12.131	OK

Units : k

One Way Shear

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	82.2 psi	0.000	OK
+1.20D+0.50Lr	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK
+1.20D	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK
+1.20D+1.60Lr	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK
+0.90D	0.0 psi	0.0 psi	0.0 psi	82.2 psi	0.000	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F2 @ SC1/2B-8**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

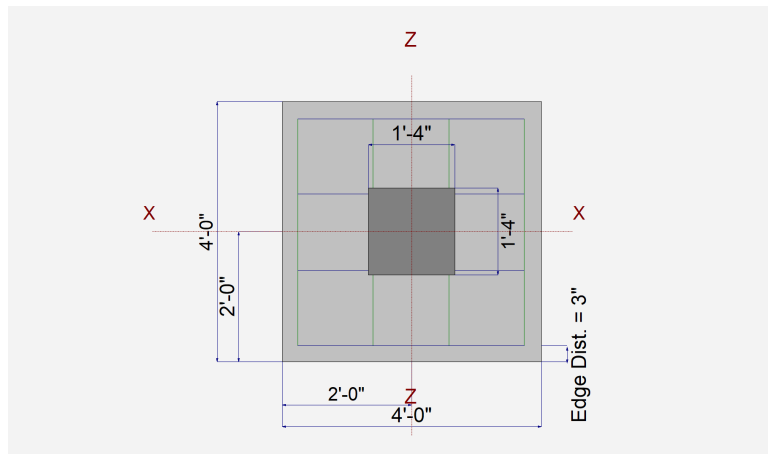
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	4.0 ft
Length parallel to Z-Z Axis	=	4.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	16.0 in
pz : parallel to Z-Z Axis	=	16.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

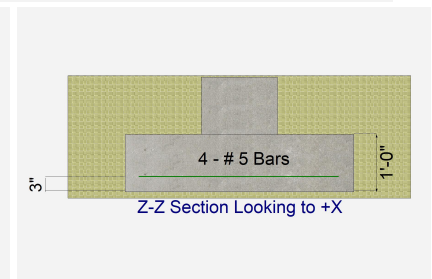
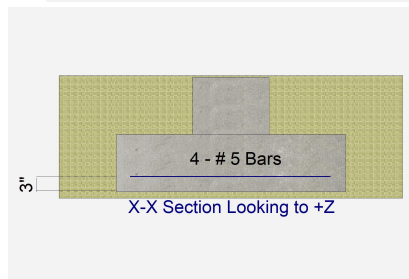
**Reinforcing**

Bars parallel to X-X Axis	=	4.0
Number of Bars	=	# 5

Bars parallel to Z-Z Axis	=	4
Number of Bars	=	# 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	=	20.650	5.890				k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F2 @ SC1/2B-8**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6340	Soil Bearing	1.902 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1556	Z Flexure (+X)	1.887 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.1556	Z Flexure (-X)	1.887 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.1556	X Flexure (+Z)	1.887 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.1556	X Flexure (-Z)	1.887 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.1436	1-way Shear (+X)	11.795 psi	82.158 psi	+1.20D+1.60L
PASS	0.1436	1-way Shear (-X)	11.795 psi	82.158 psi	+1.20D+1.60L
PASS	0.1436	1-way Shear (+Z)	11.795 psi	82.158 psi	+1.20D+1.60L
PASS	0.1436	1-way Shear (-Z)	11.795 psi	82.158 psi	+1.20D+1.60L
PASS	0.1676	2-way Punching	27.538 psi	164.317 psi	+1.20D+1.60L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.533	1.533	n/a	n/a	0.511
X-X, +D+L	3.0	n/a	0.0			1.902	1.902	n/a	n/a	0.634
X-X, +D+0.750L	3.0	n/a	0.0			1.810	1.810	n/a	n/a	0.603
X-X, +0.60D	3.0	n/a	0.0			0.920	0.920	n/a	n/a	0.307
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.533	1.533	0.511
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	1.902	1.902	0.634
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.810	1.810	0.603
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.920	0.920	0.307

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	1.591	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	1.591	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	1.887	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	1.887	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	1.527	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	1.527	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	1.363	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	1.363	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.023	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.023	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.591	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.591	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	1.887	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	1.887	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.527	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.527	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.363	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F2 @ SC1/2B-8**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
Z-Z, +1.20D	1.363	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.023	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.023	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	9.94 psi	9.94 psi	9.94 psi	82.16 psi	0.12	OK
+1.20D+1.60L	11.80 psi	11.80 psi	11.80 psi	82.16 psi	0.14	OK
+1.20D+0.50L	9.55 psi	9.55 psi	9.55 psi	82.16 psi	0.12	OK
+1.20D	8.52 psi	8.52 psi	8.52 psi	82.16 psi	0.10	OK
+0.90D	6.39 psi	6.39 psi	6.39 psi	82.16 psi	0.08	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	9.94 psi	9.94 psi	9.94 psi	82.16 psi	0.12	OK
+1.20D+1.60L	11.80 psi	11.80 psi	11.80 psi	82.16 psi	0.14	OK
+1.20D+0.50L	9.55 psi	9.55 psi	9.55 psi	82.16 psi	0.12	OK
+1.20D	8.52 psi	8.52 psi	8.52 psi	82.16 psi	0.10	OK
+0.90D	6.39 psi	6.39 psi	6.39 psi	82.16 psi	0.08	OK

All units k

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	23.21 psi	164.32psi	0.1413	OK
+1.20D+1.60L	27.54 psi	164.32psi	0.1676	OK
+1.20D+0.50L	22.29 psi	164.32psi	0.1356	OK
+1.20D	19.90 psi	164.32psi	0.1211	OK
+0.90D	14.92 psi	164.32psi	0.09082	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-9**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

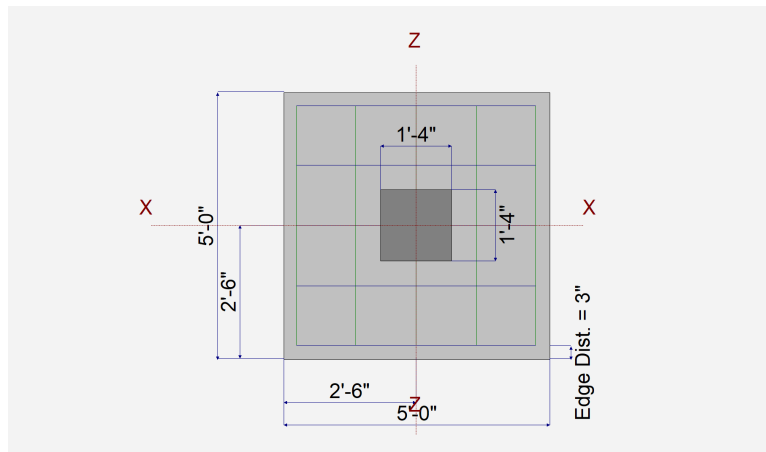
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	5.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	16.0 in
pz : parallel to Z-Z Axis	=	16.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

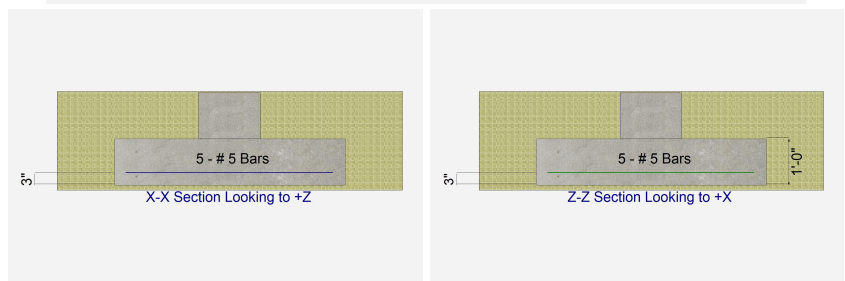
Bars parallel to X-X Axis	=	
Number of Bars	=	5
Reinforcing Bar Size	=	# 5

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

# 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	=	31.590	5.540	7.090			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-9**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.630	Soil Bearing	1.890 ksf	3.0 ksf	+D+0.750Lr+0.750L 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.2869	Z Flexure (+X)	3.481 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.2869	Z Flexure (-X)	3.481 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.2869	X Flexure (+Z)	3.481 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.2869	X Flexure (-Z)	3.481 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.2568	1-way Shear (+X)	21.099 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.2568	1-way Shear (-X)	21.099 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.2568	1-way Shear (+Z)	21.099 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.2568	1-way Shear (-Z)	21.099 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.2884	2-way Punching	47.391 psi	164.317 psi	+1.20D+0.50Lr+1.60L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.511	1.511	n/a	n/a	0.504
X-X, +D+L	3.0	n/a	0.0			1.794	1.794	n/a	n/a	0.598
X-X, +D+Lr	3.0	n/a	0.0			1.732	1.732	n/a	n/a	0.577
X-X, +D+0.750Lr+0.750L	3.0	n/a	0.0			1.890	1.890	n/a	n/a	0.630
X-X, +D+0.750L	3.0	n/a	0.0			1.723	1.723	n/a	n/a	0.574
X-X, +0.60D	3.0	n/a	0.0			0.9065	0.9065	n/a	n/a	0.302
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.511	1.511	0.504
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	1.794	1.794	0.598
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	1.732	1.732	0.577
Z-Z, +D+0.750Lr+0.750L	3.0	0.0	n/a			n/a	n/a	1.890	1.890	0.630
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.723	1.723	0.574
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.9065	0.9065	0.302

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	2.954	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	2.954	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	3.481	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	3.481	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	3.295	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	3.295	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	3.366	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	3.366	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	3.128	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	3.128	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	2.771	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	2.771	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	2.532	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-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, +1.20D	2.532	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	2.957	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	2.957	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.899	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.899	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	2.954	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	2.954	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	3.481	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	3.481	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	3.295	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	3.295	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	3.366	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	3.366	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	3.128	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	3.128	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	2.771	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	2.771	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	2.532	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	2.532	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	2.957	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	2.957	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.899	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.899	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	17.91 psi	17.91 psi	17.91 psi	82.16 psi	0.22	OK
+1.20D+0.50Lr+1.60L	21.10 psi	21.10 psi	21.10 psi	82.16 psi	0.26	OK
+1.20D+1.60L	19.97 psi	19.97 psi	19.97 psi	82.16 psi	0.24	OK
+1.20D+1.60Lr+0.50L	20.40 psi	20.40 psi	20.40 psi	82.16 psi	0.25	OK
+1.20D+1.60Lr	18.96 psi	18.96 psi	18.96 psi	82.16 psi	0.23	OK
+1.20D+0.50L	16.79 psi	16.79 psi	16.79 psi	82.16 psi	0.20	OK
+1.20D	15.35 psi	15.35 psi	15.35 psi	82.16 psi	0.19	OK
+1.20D+0.50Lr+0.50L	17.92 psi	17.92 psi	17.92 psi	82.16 psi	0.22	OK
+0.90D	11.51 psi	11.51 psi	11.51 psi	82.16 psi	0.14	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	17.91 psi	17.91 psi	17.91 psi	82.16 psi	0.22	OK
+1.20D+0.50Lr+1.60L	21.10 psi	21.10 psi	21.10 psi	82.16 psi	0.26	OK
+1.20D+1.60L	19.97 psi	19.97 psi	19.97 psi	82.16 psi	0.24	OK
+1.20D+1.60Lr+0.50L	20.40 psi	20.40 psi	20.40 psi	82.16 psi	0.25	OK
+1.20D+1.60Lr	18.96 psi	18.96 psi	18.96 psi	82.16 psi	0.23	OK
+1.20D+0.50L	16.79 psi	16.79 psi	16.79 psi	82.16 psi	0.20	OK
+1.20D	15.35 psi	15.35 psi	15.35 psi	82.16 psi	0.19	OK
+1.20D+0.50Lr+0.50L	17.92 psi	17.92 psi	17.92 psi	82.16 psi	0.22	OK
+0.90D	11.51 psi	11.51 psi	11.51 psi	82.16 psi	0.14	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	40.22 psi	164.32psi	0.2448	OK
+1.20D+0.50Lr+1.60L	47.39 psi	164.32psi	0.2884	OK
+1.20D+1.60L	44.86 psi	164.32psi	0.273	OK
+1.20D+1.60Lr+0.50L	45.83 psi	164.32psi	0.2789	OK
+1.20D+1.60Lr	42.59 psi	164.32psi	0.2592	OK
+1.20D+0.50L	37.72 psi	164.32psi	0.2296	OK
+1.20D	34.48 psi	164.32psi	0.2098	OK
+1.20D+0.50Lr+0.50L	40.25 psi	164.32psi	0.245	OK
+0.90D	25.86 psi	164.32psi	0.1574	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ C12/2B-8**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

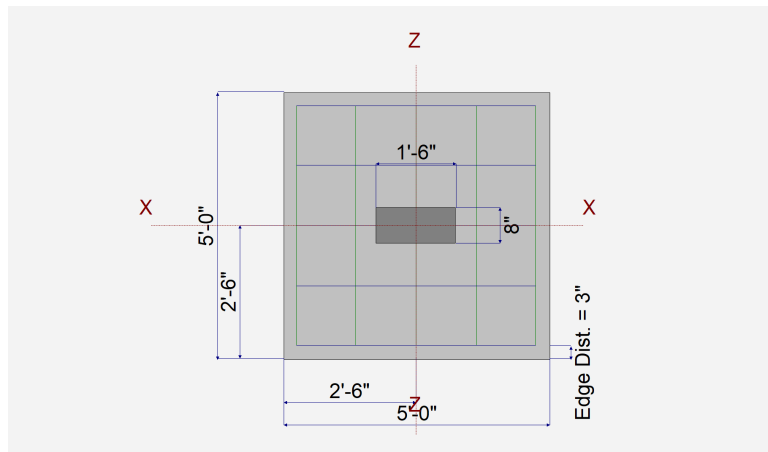
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	5.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	18.0 in
pz : parallel to Z-Z Axis	=	8.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

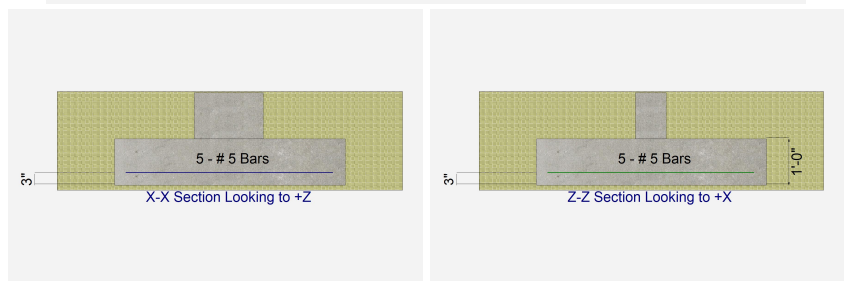
Bars parallel to X-X Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bars parallel to Z-Z Axis	=	5.0
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	=	18.140	3.470	2.430			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F3 @ C12/2B-8**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.3843	Soil Bearing	1.153 ksf	3.0 ksf	+D+0.750Lr+0.750L 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1434	Z Flexure (+X)	1.740 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.1434	Z Flexure (-X)	1.740 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.2198	X Flexure (+Z)	2.667 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.2198	X Flexure (-Z)	2.667 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.1280	1-way Shear (+X)	10.520 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.1280	1-way Shear (-X)	10.520 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.1793	1-way Shear (+Z)	14.727 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.1793	1-way Shear (-Z)	14.727 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.2026	2-way Punching	31.444 psi	155.188 psi	+1.20D+1.60Lr+0.50L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			0.9762	0.9762	n/a	n/a	0.325
X-X, +D+L	3.0	n/a	0.0			1.073	1.073	n/a	n/a	0.358
X-X, +D+Lr	3.0	n/a	0.0			1.115	1.115	n/a	n/a	0.372
X-X, +D+0.750Lr+0.750L	3.0	n/a	0.0			1.153	1.153	n/a	n/a	0.384
X-X, +D+0.750L	3.0	n/a	0.0			1.049	1.049	n/a	n/a	0.350
X-X, +0.60D	3.0	n/a	0.0			0.5857	0.5857	n/a	n/a	0.195
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	0.9762	0.9762	0.325
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	1.073	1.073	0.358
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	1.115	1.115	0.372
Z-Z, +D+0.750Lr+0.750L	3.0	0.0	n/a			n/a	n/a	1.153	1.153	0.384
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.049	1.049	0.350
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.5857	0.5857	0.195

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	2.370	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	2.370	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	2.559	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	2.559	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	2.396	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	2.396	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	2.667	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	2.667	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	2.553	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	2.553	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	2.145	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	2.145	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	2.031	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ C12/2B-8**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, +1.20D	2.031	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	2.308	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	2.308	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.523	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.523	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.546	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.546	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	1.670	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	1.670	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	1.563	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	1.563	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	1.740	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	1.740	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	1.665	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	1.665	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.40	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.40	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.325	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.325	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	1.506	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	1.506	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	0.9939	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	0.9939	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	9.35 psi	9.35 psi	13.09 psi	82.16 psi	0.16	OK
+1.20D+0.50Lr+1.60L	10.10 psi	10.10 psi	14.13 psi	82.16 psi	0.17	OK
+1.20D+1.60L	9.45 psi	9.45 psi	13.24 psi	82.16 psi	0.16	OK
+1.20D+1.60Lr+0.50L	10.52 psi	10.52 psi	14.73 psi	82.16 psi	0.18	OK
+1.20D+1.60Lr	10.07 psi	10.07 psi	14.10 psi	82.16 psi	0.17	OK
+1.20D+0.50L	8.46 psi	8.46 psi	11.85 psi	82.16 psi	0.14	OK
+1.20D	8.01 psi	8.01 psi	11.22 psi	82.16 psi	0.14	OK
+1.20D+0.50Lr+0.50L	9.11 psi	9.11 psi	12.75 psi	82.16 psi	0.16	OK
+0.90D	6.01 psi	6.01 psi	8.41 psi	82.16 psi	0.10	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	13.09 psi	13.09 psi	13.09 psi	82.16 psi	0.16	OK
+1.20D+0.50Lr+1.60L	14.13 psi	14.13 psi	14.13 psi	82.16 psi	0.17	OK
+1.20D+1.60L	13.24 psi	13.24 psi	13.24 psi	82.16 psi	0.16	OK
+1.20D+1.60Lr+0.50L	14.73 psi	14.73 psi	14.73 psi	82.16 psi	0.18	OK
+1.20D+1.60Lr	14.10 psi	14.10 psi	14.10 psi	82.16 psi	0.17	OK
+1.20D+0.50L	11.85 psi	11.85 psi	11.85 psi	82.16 psi	0.14	OK
+1.20D	11.22 psi	11.22 psi	11.22 psi	82.16 psi	0.14	OK
+1.20D+0.50Lr+0.50L	12.75 psi	12.75 psi	12.75 psi	82.16 psi	0.16	OK
+0.90D	8.41 psi	8.41 psi	8.41 psi	82.16 psi	0.10	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	27.95 psi	155.19psi	0.1801	OK
+1.20D+0.50Lr+1.60L	30.18 psi	155.19psi	0.1945	OK
+1.20D+1.60L	28.26 psi	155.19psi	0.1821	OK
+1.20D+1.60Lr+0.50L	31.44 psi	155.19psi	0.2026	OK
+1.20D+1.60Lr	30.10 psi	155.19psi	0.194	OK
+1.20D+0.50L	25.30 psi	155.19psi	0.163	OK
+1.20D	23.95 psi	155.19psi	0.1543	OK
+1.20D+0.50Lr+0.50L	27.22 psi	155.19psi	0.1754	OK
+0.90D	17.96 psi	155.19psi	0.1158	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-6 (KITCHEN CRITICAL LOAD)**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

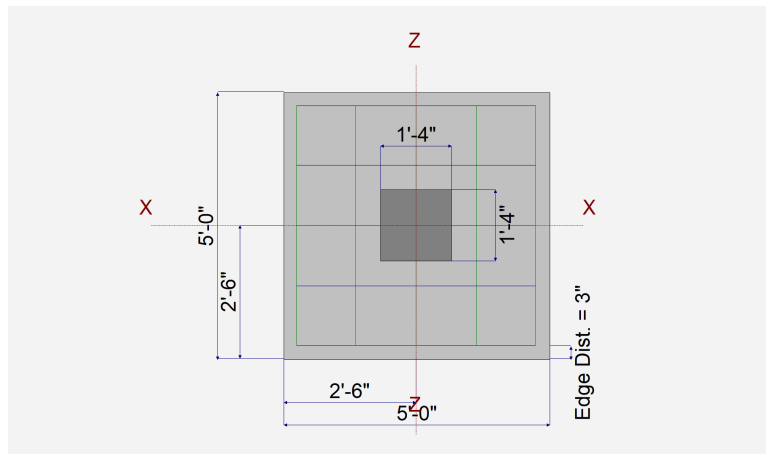
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	5.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	16.0 in
pz : parallel to Z-Z Axis	=	16.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

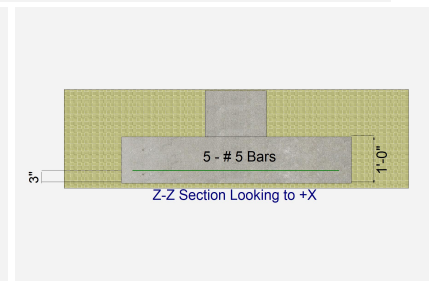
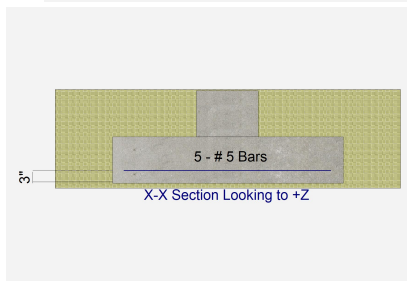
Bars parallel to X-X Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bars parallel to Z-Z Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

# 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	=	37.310	0.0	10.980			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-6 (KITCHEN CRITICAL LOAD)**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7263	Soil Bearing	2.179 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.3441	Z Flexure (+X)	4.175 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.3441	Z Flexure (-X)	4.175 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.3441	X Flexure (+Z)	4.175 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.3441	X Flexure (-Z)	4.175 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.3080	1-way Shear (+X)	25.302 psi	82.158 psi	+1.20D+1.60L
PASS	0.3080	1-way Shear (-X)	25.302 psi	82.158 psi	+1.20D+1.60L
PASS	0.3080	1-way Shear (+Z)	25.302 psi	82.158 psi	+1.20D+1.60L
PASS	0.3080	1-way Shear (-Z)	25.302 psi	82.158 psi	+1.20D+1.60L
PASS	0.3459	2-way Punching	56.833 psi	164.317 psi	+1.20D+1.60L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.740	1.740	n/a	n/a	0.580
X-X, +D+L	3.0	n/a	0.0			2.179	2.179	n/a	n/a	0.726
X-X, +D+0.750L	3.0	n/a	0.0			2.069	2.069	n/a	n/a	0.690
X-X, +0.60D	3.0	n/a	0.0			1.044	1.044	n/a	n/a	0.348
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.740	1.740	0.580
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	2.179	2.179	0.726
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	2.069	2.069	0.690
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	1.044	1.044	0.348

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	3.493	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	3.493	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	4.175	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	4.175	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	3.363	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	3.363	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	2.994	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	2.994	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	2.245	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	2.245	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	3.493	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	3.493	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	4.175	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	4.175	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	3.363	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	3.363	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	2.994	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-6 (KITCHEN CRITICAL LOAD)**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
Z-Z, +1.20D	2.994	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	2.245	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	2.245	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	21.17 psi	21.17 psi	21.17 psi	82.16 psi	0.26	OK
+1.20D+1.60L	25.30 psi	25.30 psi	25.30 psi	82.16 psi	0.31	OK
+1.20D+0.50L	20.38 psi	20.38 psi	20.38 psi	82.16 psi	0.25	OK
+1.20D	18.15 psi	18.15 psi	18.15 psi	82.16 psi	0.22	OK
+0.90D	13.61 psi	13.61 psi	13.61 psi	82.16 psi	0.17	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	21.17 psi	21.17 psi	21.17 psi	82.16 psi	0.26	OK
+1.20D+1.60L	25.30 psi	25.30 psi	25.30 psi	82.16 psi	0.31	OK
+1.20D+0.50L	20.38 psi	20.38 psi	20.38 psi	82.16 psi	0.25	OK
+1.20D	18.15 psi	18.15 psi	18.15 psi	82.16 psi	0.22	OK
+0.90D	13.61 psi	13.61 psi	13.61 psi	82.16 psi	0.17	OK

All units k

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	47.55 psi	164.32 psi	0.2894	OK
+1.20D+1.60L	56.83 psi	164.32 psi	0.3459	OK
+1.20D+0.50L	45.78 psi	164.32 psi	0.2786	OK
+1.20D	40.76 psi	164.32 psi	0.248	OK
+0.90D	30.57 psi	164.32 psi	0.186	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F3 @ SC1/2B-4/2B-5/2B-6**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

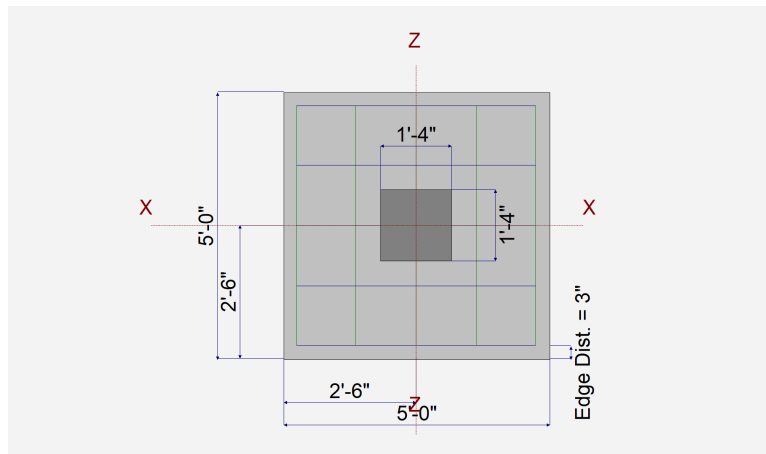
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	5.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	16.0 in
pz : parallel to Z-Z Axis	=	16.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

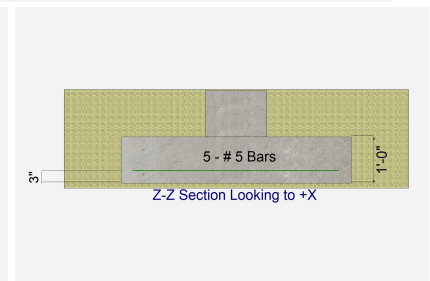
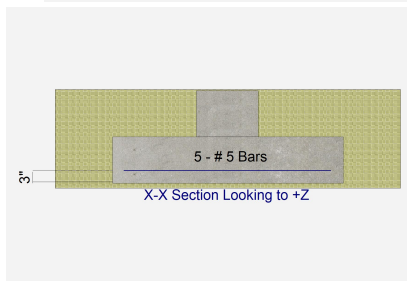
Bars parallel to X-X Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bars parallel to Z-Z Axis	=	5.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

# 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	=	31.740	8.230				k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-4/2B-5/2B-6**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6153	Soil Bearing	1.846 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.2827	Z Flexure (+X)	3.429 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.2827	Z Flexure (-X)	3.429 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.2827	X Flexure (+Z)	3.429 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.2827	X Flexure (-Z)	3.429 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60L
PASS	0.2530	1-way Shear (+X)	20.786 psi	82.158 psi	+1.20D+1.60L
PASS	0.2530	1-way Shear (-X)	20.786 psi	82.158 psi	+1.20D+1.60L
PASS	0.2530	1-way Shear (+Z)	20.786 psi	82.158 psi	+1.20D+1.60L
PASS	0.2530	1-way Shear (-Z)	20.786 psi	82.158 psi	+1.20D+1.60L
PASS	0.2841	2-way Punching	46.690 psi	164.317 psi	+1.20D+1.60L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.517	1.517	n/a	n/a	0.506
X-X, +D+L	3.0	n/a	0.0			1.846	1.846	n/a	n/a	0.615
X-X, +D+0.750L	3.0	n/a	0.0			1.764	1.764	n/a	n/a	0.588
X-X, +0.60D	3.0	n/a	0.0			0.9101	0.9101	n/a	n/a	0.303
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.517	1.517	0.506
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	1.846	1.846	0.615
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.764	1.764	0.588
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.9101	0.9101	0.303

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	2.968	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	2.968	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	3.429	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	3.429	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	2.821	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	2.821	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	2.544	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	2.544	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.908	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.908	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	2.968	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	2.968	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	3.429	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	3.429	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	2.821	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	2.821	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	2.544	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F3 @ SC1/2B-4/2B-5/2B-6**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
Z-Z, +1.20D	2.544	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.908	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.908	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	17.99 psi	17.99 psi	17.99 psi	82.16 psi	0.22	OK
+1.20D+1.60L	20.79 psi	20.79 psi	20.79 psi	82.16 psi	0.25	OK
+1.20D+0.50L	17.10 psi	17.10 psi	17.10 psi	82.16 psi	0.21	OK
+1.20D	15.42 psi	15.42 psi	15.42 psi	82.16 psi	0.19	OK
+0.90D	11.57 psi	11.57 psi	11.57 psi	82.16 psi	0.14	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	17.99 psi	17.99 psi	17.99 psi	82.16 psi	0.22	OK
+1.20D+1.60L	20.79 psi	20.79 psi	20.79 psi	82.16 psi	0.25	OK
+1.20D+0.50L	17.10 psi	17.10 psi	17.10 psi	82.16 psi	0.21	OK
+1.20D	15.42 psi	15.42 psi	15.42 psi	82.16 psi	0.19	OK
+0.90D	11.57 psi	11.57 psi	11.57 psi	82.16 psi	0.14	OK

All units k

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	40.41 psi	164.32psi	0.2459	OK
+1.20D+1.60L	46.69 psi	164.32psi	0.2841	OK
+1.20D+0.50L	38.41 psi	164.32psi	0.2337	OK
+1.20D	34.64 psi	164.32psi	0.2108	OK
+0.90D	25.98 psi	164.32psi	0.1581	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F4 @ C6/2B-2/2B-6**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

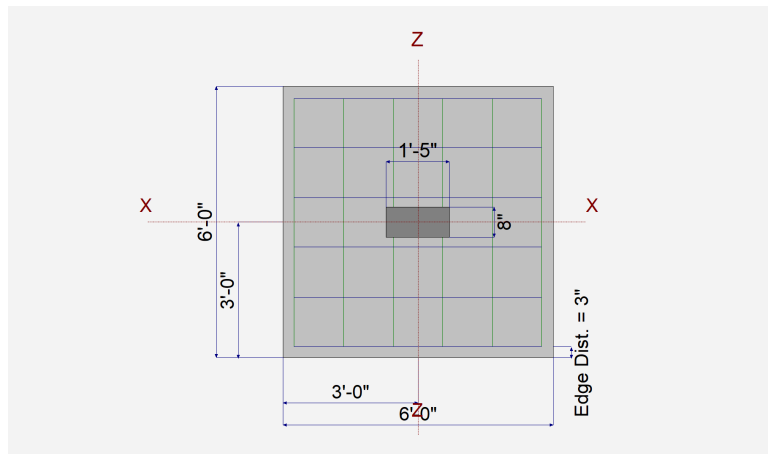
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	6.0 ft
Length parallel to Z-Z Axis	=	6.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	17.0 in
pz : parallel to Z-Z Axis	=	8.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

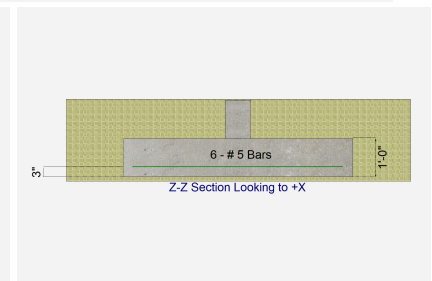
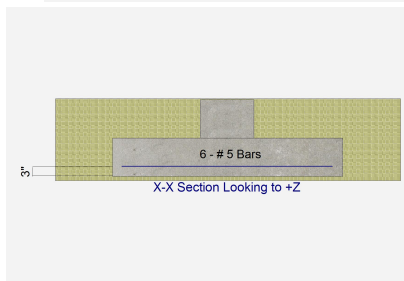
Bars parallel to X-X Axis	=	6.0
Number of Bars	=	# 5

Bars parallel to Z-Z Axis	=	6.0
Number of Bars	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

# 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	=	54.260	3.740	10.050			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F4 @ C6/2B-2/2B-6**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6823	Soil Bearing	2.047 ksf	3.0 ksf	+D+0.750Lr+0.750L 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.4987	Z Flexure (+X)	6.049 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.4987	Z Flexure (-X)	6.049 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.6752	X Flexure (+Z)	8.191 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.6752	X Flexure (-Z)	8.191 k-ft/ft	12.131 k-ft/ft	+1.20D+0.50Lr+1.60L
PASS	0.4050	1-way Shear (+X)	33.277 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.4050	1-way Shear (-X)	33.277 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.4985	1-way Shear (+Z)	40.957 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.4985	1-way Shear (-Z)	40.957 psi	82.158 psi	+1.20D+0.50Lr+1.60L
PASS	0.6138	2-way Punching	97.896 psi	159.484 psi	+1.20D+0.50Lr+1.60L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.759	1.759	n/a	n/a	0.586
X-X, +D+L	3.0	n/a	0.0			2.039	2.039	n/a	n/a	0.680
X-X, +D+Lr	3.0	n/a	0.0			1.863	1.863	n/a	n/a	0.621
X-X, +D+0.750Lr+0.750L	3.0	n/a	0.0			2.047	2.047	n/a	n/a	0.682
X-X, +D+0.750L	3.0	n/a	0.0			1.969	1.969	n/a	n/a	0.656
X-X, +0.60D	3.0	n/a	0.0			1.056	1.056	n/a	n/a	0.352
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.759	1.759	0.586
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	2.039	2.039	0.680
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	1.863	1.863	0.621
Z-Z, +D+0.750Lr+0.750L	3.0	0.0	n/a			n/a	n/a	2.047	2.047	0.682
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.969	1.969	0.656
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	1.056	1.056	0.352

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	7.488	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	7.488	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	8.191	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	8.191	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	8.006	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	8.006	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	7.505	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	7.505	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	7.009	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	7.009	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	6.914	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	6.914	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	6.418	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F4 @ C6/2B-2/2B-6**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, +1.20D	6.418	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	7.099	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	7.099	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	4.813	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	4.813	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	5.530	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	5.530	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	6.049	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	6.049	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	5.913	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	5.913	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	5.543	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	5.543	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	5.177	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	5.177	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	5.107	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	5.107	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	4.740	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	4.740	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	5.243	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	5.243	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	3.555	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	3.555	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	30.42 psi	30.42 psi	37.44 psi	82.16 psi	0.46	OK
+1.20D+0.50Lr+1.60L	33.28 psi	33.28 psi	40.96 psi	82.16 psi	0.50	OK
+1.20D+1.60L	32.53 psi	32.53 psi	40.03 psi	82.16 psi	0.49	OK
+1.20D+1.60Lr+0.50L	30.49 psi	30.49 psi	37.53 psi	82.16 psi	0.46	OK
+1.20D+1.60Lr	28.48 psi	28.48 psi	35.05 psi	82.16 psi	0.43	OK
+1.20D+0.50L	28.09 psi	28.09 psi	34.57 psi	82.16 psi	0.42	OK
+1.20D	26.08 psi	26.08 psi	32.09 psi	82.16 psi	0.39	OK
+1.20D+0.50Lr+0.50L	28.84 psi	28.84 psi	35.50 psi	82.16 psi	0.43	OK
+0.90D	19.56 psi	19.56 psi	24.07 psi	82.16 psi	0.29	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	37.44 psi	37.44 psi	37.44 psi	82.16 psi	0.46	OK
+1.20D+0.50Lr+1.60L	40.96 psi	40.96 psi	40.96 psi	82.16 psi	0.50	OK
+1.20D+1.60L	40.03 psi	40.03 psi	40.03 psi	82.16 psi	0.49	OK
+1.20D+1.60Lr+0.50L	37.53 psi	37.53 psi	37.53 psi	82.16 psi	0.46	OK
+1.20D+1.60Lr	35.05 psi	35.05 psi	35.05 psi	82.16 psi	0.43	OK
+1.20D+0.50L	34.57 psi	34.57 psi	34.57 psi	82.16 psi	0.42	OK
+1.20D	32.09 psi	32.09 psi	32.09 psi	82.16 psi	0.39	OK
+1.20D+0.50Lr+0.50L	35.50 psi	35.50 psi	35.50 psi	82.16 psi	0.43	OK
+0.90D	24.07 psi	24.07 psi	24.07 psi	82.16 psi	0.29	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	89.49 psi	159.48psi	0.5611	OK
+1.20D+0.50Lr+1.60L	97.90 psi	159.48psi	0.6138	OK
+1.20D+1.60L	95.69 psi	159.48psi	0.6	OK
+1.20D+1.60Lr+0.50L	89.70 psi	159.48psi	0.5625	OK
+1.20D+1.60Lr	83.77 psi	159.48psi	0.5253	OK
+1.20D+0.50L	82.64 psi	159.48psi	0.5182	OK
+1.20D	76.71 psi	159.48psi	0.481	OK
+1.20D+0.50Lr+0.50L	84.85 psi	159.48psi	0.532	OK
+0.90D	57.53 psi	159.48psi	0.3607	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F4 @ C2/2B-2/2B-3**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

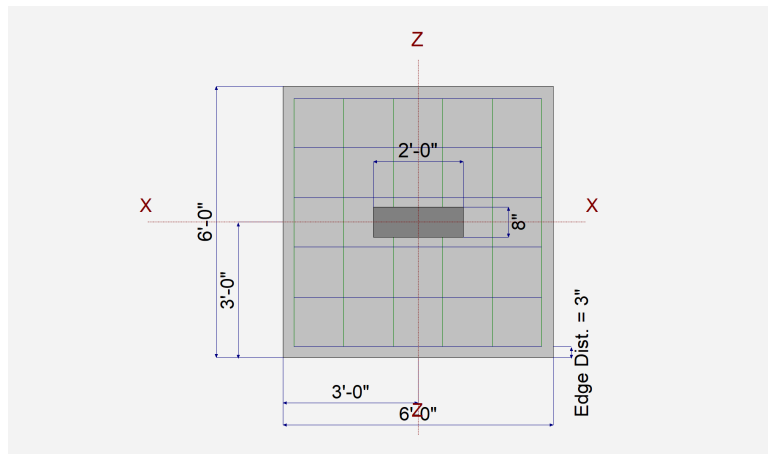
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	6.0 ft
Length parallel to Z-Z Axis	=	6.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	24.0 in
pz : parallel to Z-Z Axis	=	8.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

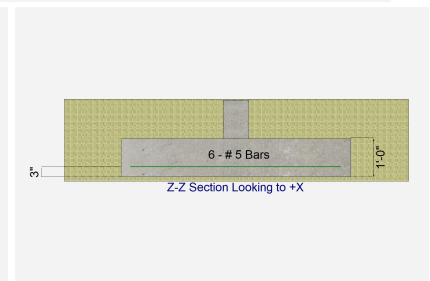
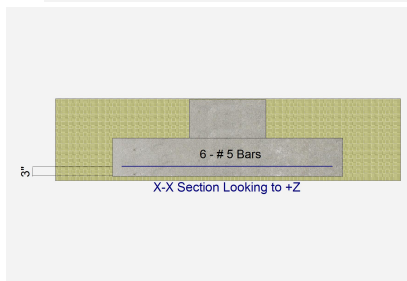
Bars parallel to X-X Axis	=	6.0
Number of Bars	=	# 5

Bars parallel to Z-Z Axis	=	6.0
Number of Bars	=	# 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	=	40.140	6.880	3.70			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F4 @ C2/2B-2/2B-3**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.5287	Soil Bearing	1.586 ksf	3.0 ksf	+D+0.750Lr+0.750L 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.2786	Z Flexure (+X)	3.380 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.2786	Z Flexure (-X)	3.380 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.4954	X Flexure (+Z)	6.009 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.4954	X Flexure (-Z)	6.009 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.240	1-way Shear (+X)	19.720 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.240	1-way Shear (-X)	19.720 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.3657	1-way Shear (+Z)	30.049 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.3657	1-way Shear (-Z)	30.049 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.4393	2-way Punching	60.147 psi	136.931 psi	+1.20D+1.60Lr+0.50L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.366	1.366	n/a	n/a	0.455
X-X, +D+L	3.0	n/a	0.0			1.469	1.469	n/a	n/a	0.490
X-X, +D+Lr	3.0	n/a	0.0			1.557	1.557	n/a	n/a	0.519
X-X, +D+0.750Lr+0.750L	3.0	n/a	0.0			1.586	1.586	n/a	n/a	0.529
X-X, +D+0.750L	3.0	n/a	0.0			1.443	1.443	n/a	n/a	0.481
X-X, +0.60D	3.0	n/a	0.0			0.8196	0.8196	n/a	n/a	0.273
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.366	1.366	0.455
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	1.469	1.469	0.490
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	1.557	1.557	0.519
Z-Z, +D+0.750Lr+0.750L	3.0	0.0	n/a			n/a	n/a	1.586	1.586	0.529
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.443	1.443	0.481
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.8196	0.8196	0.273

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	5.529	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	5.529	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	5.664	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+1.60L	5.664	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	5.324	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60L	5.324	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	6.009	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50L	6.009	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	5.827	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	5.827	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	4.922	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50L	4.922	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	4.739	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F4 @ C2/2B-2/2B-3**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, +1.20D	4.739	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	5.262	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+0.50L	5.262	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	3.555	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	3.555	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	3.110	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	3.110	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	3.186	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	3.186	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	2.995	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	2.995	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	3.380	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	3.380	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	3.277	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	3.277	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	2.769	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	2.769	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	2.666	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	2.666	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	2.960	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	2.960	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.999	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.999	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	18.15 psi	18.15 psi	27.65 psi	82.16 psi	0.34	OK
+1.20D+0.50Lr+1.60L	18.59 psi	18.59 psi	28.32 psi	82.16 psi	0.34	OK
+1.20D+1.60L	17.47 psi	17.47 psi	26.62 psi	82.16 psi	0.32	OK
+1.20D+1.60Lr+0.50L	19.72 psi	19.72 psi	30.05 psi	82.16 psi	0.37	OK
+1.20D+1.60Lr	19.12 psi	19.12 psi	29.14 psi	82.16 psi	0.35	OK
+1.20D+0.50L	16.15 psi	16.15 psi	24.61 psi	82.16 psi	0.30	OK
+1.20D	15.55 psi	15.55 psi	23.70 psi	82.16 psi	0.29	OK
+1.20D+0.50Lr+0.50L	17.27 psi	17.27 psi	26.31 psi	82.16 psi	0.32	OK
+0.90D	11.67 psi	11.67 psi	17.78 psi	82.16 psi	0.22	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	27.65 psi	27.65 psi	27.65 psi	82.16 psi	0.34	OK
+1.20D+0.50Lr+1.60L	28.32 psi	28.32 psi	28.32 psi	82.16 psi	0.34	OK
+1.20D+1.60L	26.62 psi	26.62 psi	26.62 psi	82.16 psi	0.32	OK
+1.20D+1.60Lr+0.50L	30.05 psi	30.05 psi	30.05 psi	82.16 psi	0.37	OK
+1.20D+1.60Lr	29.14 psi	29.14 psi	29.14 psi	82.16 psi	0.35	OK
+1.20D+0.50L	24.61 psi	24.61 psi	24.61 psi	82.16 psi	0.30	OK
+1.20D	23.70 psi	23.70 psi	23.70 psi	82.16 psi	0.29	OK
+1.20D+0.50Lr+0.50L	26.31 psi	26.31 psi	26.31 psi	82.16 psi	0.32	OK
+0.90D	17.78 psi	17.78 psi	17.78 psi	82.16 psi	0.22	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	55.34 psi	136.93psi	0.4042	OK
+1.20D+0.50Lr+1.60L	56.69 psi	136.93psi	0.414	OK
+1.20D+1.60L	53.29 psi	136.93psi	0.3892	OK
+1.20D+1.60Lr+0.50L	60.15 psi	136.93psi	0.4393	OK
+1.20D+1.60Lr	58.32 psi	136.93psi	0.4259	OK
+1.20D+0.50L	49.27 psi	136.93psi	0.3598	OK
+1.20D	47.44 psi	136.93psi	0.3464	OK
+1.20D+0.50Lr+0.50L	52.67 psi	136.93psi	0.3846	OK
+0.90D	35.58 psi	136.93psi	0.2598	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F4 @ MC/1B-44/1B-5**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf ft

Increases based on footing plan dimension

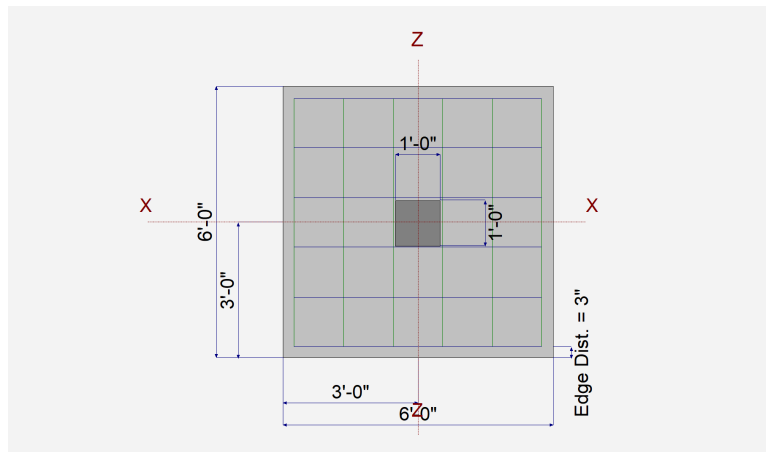
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf ft
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Dimensions

Width parallel to X-X Axis	=	6.0 ft
Length parallel to Z-Z Axis	=	6.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	12.0 in
pz : parallel to Z-Z Axis	=	12.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

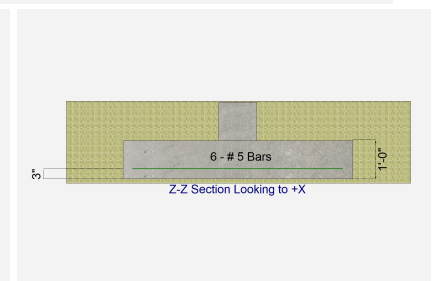
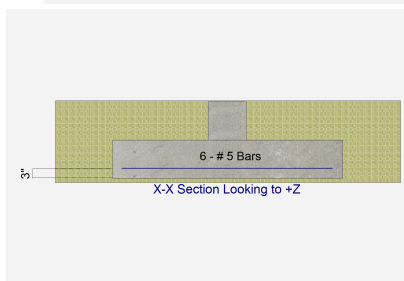
Bars parallel to X-X Axis	=	6.0
Number of Bars	=	# 5

Bars parallel to Z-Z Axis	=	6.0
Number of Bars	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

# 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	=	13.750	3.980		-5.20		k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F4 @ MC/1B-44/1B-5**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.2481	Soil Bearing	0.7444 ksf	3.0 ksf	+D+Lr 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	4.388	Uplift	-3.120 k	13.692 k	+0.60D+0.60W
PASS	0.1627	Z Flexure (+X)	1.973 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr
PASS	0.1627	Z Flexure (-X)	1.973 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr
PASS	0.1627	X Flexure (+Z)	1.973 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr
PASS	0.1627	X Flexure (-Z)	1.973 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr
PASS	0.1238	1-way Shear (+X)	10.175 psi	82.158 psi	+1.20D+1.60Lr
PASS	0.1238	1-way Shear (-X)	10.175 psi	82.158 psi	+1.20D+1.60Lr
PASS	0.1238	1-way Shear (+Z)	10.175 psi	82.158 psi	+1.20D+1.60Lr
PASS	0.1238	1-way Shear (-Z)	10.175 psi	82.158 psi	+1.20D+1.60Lr
PASS	0.1666	2-way Punching	27.367 psi	164.317 psi	+1.20D+1.60Lr

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			0.6339	0.6339	n/a	n/a	0.211
X-X, +D+Lr	3.0	n/a	0.0			0.7444	0.7444	n/a	n/a	0.248
X-X, +D+0.750Lr	3.0	n/a	0.0			0.7168	0.7168	n/a	n/a	0.239
X-X, +D+0.60W	3.0	n/a	0.0			0.5472	0.5472	n/a	n/a	0.182
X-X, +D+0.750Lr+0.450W	3.0	n/a	0.0			0.6518	0.6518	n/a	n/a	0.217
X-X, +D+0.450W	3.0	n/a	0.0			0.5689	0.5689	n/a	n/a	0.190
X-X, +0.60D+0.60W	3.0	n/a	0.0			0.2937	0.2937	n/a	n/a	0.098
X-X, +0.60D	3.0	n/a	0.0			0.3803	0.3803	n/a	n/a	0.127
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	0.6339	0.6339	0.211
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	0.7444	0.7444	0.248
Z-Z, +D+0.750Lr	3.0	0.0	n/a			n/a	n/a	0.7168	0.7168	0.239
Z-Z, +D+0.60W	3.0	0.0	n/a			n/a	n/a	0.5472	0.5472	0.182
Z-Z, +D+0.750Lr+0.450W	3.0	0.0	n/a			n/a	n/a	0.6518	0.6518	0.217
Z-Z, +D+0.450W	3.0	0.0	n/a			n/a	n/a	0.5689	0.5689	0.190
Z-Z, +0.60D+0.60W	3.0	0.0	n/a			n/a	n/a	0.2937	0.2937	0.098
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.3803	0.3803	0.127

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	1.658	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.40D	1.658	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr	1.593	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr	1.593	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	1.421	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D	1.421	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	1.973	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr	1.973	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+1.60Lr+0.50W	1.748	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F4 @ MC/1B-44/1B-5**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, +1.20D+1.60Lr+0.50W	1.748	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50W	1.195	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50W	1.195	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+W	1.142	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+0.50Lr+W	1.142	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+W	0.9694	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +1.20D+W	0.9694	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D+W	0.6142	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D+W	0.6142	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.066	+Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
X-X, +0.90D	1.066	-Z	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.658	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.658	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr	1.593	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr	1.593	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.421	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.421	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	1.973	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	1.973	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50W	1.748	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50W	1.748	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50W	1.195	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50W	1.195	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+W	1.142	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+W	1.142	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+W	0.9694	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+W	0.9694	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D+W	0.6142	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D+W	0.6142	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.066	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.066	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	8.55 psi	8.55 psi	8.55 psi	82.16 psi	0.10	OK
+1.20D+0.50Lr	8.22 psi	8.22 psi	8.22 psi	82.16 psi	0.10	OK
+1.20D	7.33 psi	7.33 psi	7.33 psi	82.16 psi	0.09	OK
+1.20D+1.60Lr	10.18 psi	10.18 psi	10.18 psi	82.16 psi	0.12	OK
+1.20D+1.60Lr+0.50W	9.01 psi	9.01 psi	9.01 psi	82.16 psi	0.11	OK
+1.20D+0.50W	6.16 psi	6.16 psi	6.16 psi	82.16 psi	0.08	OK
+1.20D+0.50Lr+W	5.89 psi	5.89 psi	5.89 psi	82.16 psi	0.07	OK
+1.20D+W	5.00 psi	5.00 psi	5.00 psi	82.16 psi	0.06	OK
+0.90D+W	3.17 psi	3.17 psi	3.17 psi	82.16 psi	0.04	OK
+0.90D	5.49 psi	5.49 psi	5.49 psi	82.16 psi	0.07	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	8.55 psi	8.55 psi	8.55 psi	82.16 psi	0.10	OK
+1.20D+0.50Lr	8.22 psi	8.22 psi	8.22 psi	82.16 psi	0.10	OK
+1.20D	7.33 psi	7.33 psi	7.33 psi	82.16 psi	0.09	OK
+1.20D+1.60Lr	10.18 psi	10.18 psi	10.18 psi	82.16 psi	0.12	OK
+1.20D+1.60Lr+0.50W	9.01 psi	9.01 psi	9.01 psi	82.16 psi	0.11	OK
+1.20D+0.50W	6.16 psi	6.16 psi	6.16 psi	82.16 psi	0.08	OK
+1.20D+0.50Lr+W	5.89 psi	5.89 psi	5.89 psi	82.16 psi	0.07	OK
+1.20D+W	5.00 psi	5.00 psi	5.00 psi	82.16 psi	0.06	OK
+0.90D+W	3.17 psi	3.17 psi	3.17 psi	82.16 psi	0.04	OK
+0.90D	5.49 psi	5.49 psi	5.49 psi	82.16 psi	0.07	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	22.99 psi	164.32psi	0.1399	OK
+1.20D+0.50Lr	22.10 psi	164.32psi	0.1345	OK
+1.20D	19.70 psi	164.32psi	0.1199	OK

All units k

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F4 @ MC/1B-44/1B-5**Two-Way "Punching" Shear**

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.20D+1.60Lr	27.37 psi	164.32psi	0.1666	OK
+1.20D+1.60Lr+0.50W	24.24 psi	164.32psi	0.1475	OK
+1.20D+0.50W	16.57 psi	164.32psi	0.1009	OK
+1.20D+0.50Lr+W	15.84 psi	164.32psi	0.09639	OK
+1.20D+W	13.44 psi	164.32psi	0.08181	OK
+0.90D+W	8.52 psi	164.32psi	0.05184	OK
+0.90D	14.78 psi	164.32psi	0.08993	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F5 @ C8/2B-3/2B-4/1B-2**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.7527	Soil Bearing	2.258 ksf	3.0 ksf	+D+0.750Lr+0.750L 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1432	Z Flexure (+X)	1.737 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.1432	Z Flexure (-X)	1.737 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.8853	X Flexure (+Z)	12.797 k-ft/ft	14.455 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.8853	X Flexure (-Z)	12.797 k-ft/ft	14.455 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.1151	1-way Shear (+X)	9.453 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.1151	1-way Shear (-X)	9.453 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.7047	1-way Shear (+Z)	57.90 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.7047	1-way Shear (-Z)	57.90 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.5999	2-way Punching	73.929 psi	123.238 psi	+1.20D+1.60Lr+0.50L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.893	1.893	n/a	n/a	0.631
X-X, +D+L	3.0	n/a	0.0			2.067	2.067	n/a	n/a	0.689
X-X, +D+Lr	3.0	n/a	0.0			2.205	2.205	n/a	n/a	0.735
X-X, +D+0.750Lr+0.750L	3.0	n/a	0.0			2.258	2.258	n/a	n/a	0.753
X-X, +D+0.750L	3.0	n/a	0.0			2.023	2.023	n/a	n/a	0.674
X-X, +0.60D	3.0	n/a	0.0			1.136	1.136	n/a	n/a	0.379
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.893	1.893	0.631
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	2.067	2.067	0.689
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	2.205	2.205	0.735
Z-Z, +D+0.750Lr+0.750L	3.0	0.0	n/a			n/a	n/a	2.258	2.258	0.753
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	2.023	2.023	0.674
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	1.136	1.136	0.379

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	11.494	+Z	Bottom	0.2932	Applied Mu	0.3720	14.455	OK
X-X, +1.40D	11.494	-Z	Bottom	0.2932	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+1.60L	12.034	+Z	Bottom	0.3074	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+1.60L	12.034	-Z	Bottom	0.3074	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60L	11.250	+Z	Bottom	0.2867	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60L	11.250	-Z	Bottom	0.2867	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr+0.50L	12.797	+Z	Bottom	0.3277	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr+0.50L	12.797	-Z	Bottom	0.3277	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr	12.360	+Z	Bottom	0.3161	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr	12.360	-Z	Bottom	0.3161	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50L	10.289	+Z	Bottom	0.2615	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50L	10.289	-Z	Bottom	0.2615	Applied Mu	0.3720	14.455	OK
X-X, +1.20D	9.852	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F5 @ C8/2B-3/2B-4/1B-2**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, +1.20D	9.852	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+0.50L	11.073	+Z	Bottom	0.2821	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+0.50L	11.073	-Z	Bottom	0.2821	Applied Mu	0.3720	14.455	OK
X-X, +0.90D	7.389	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +0.90D	7.389	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
Z-Z, +1.40D	1.560	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	1.560	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	1.633	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	1.633	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	1.527	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	1.527	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	1.737	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	1.737	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	1.677	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	1.677	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.396	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.396	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.337	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.337	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	1.503	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	1.503	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.003	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.003	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	8.49 psi	8.49 psi	52.01 psi	82.16 psi	0.63	OK
+1.20D+0.50Lr+1.60L	8.89 psi	8.89 psi	54.45 psi	82.16 psi	0.66	OK
+1.20D+1.60L	8.31 psi	8.31 psi	50.90 psi	82.16 psi	0.62	OK
+1.20D+1.60Lr+0.50L	9.45 psi	9.45 psi	57.90 psi	82.16 psi	0.70	OK
+1.20D+1.60Lr	9.13 psi	9.13 psi	55.92 psi	82.16 psi	0.68	OK
+1.20D+0.50L	7.60 psi	7.60 psi	46.56 psi	82.16 psi	0.57	OK
+1.20D	7.28 psi	7.28 psi	44.58 psi	82.16 psi	0.54	OK
+1.20D+0.50Lr+0.50L	8.18 psi	8.18 psi	50.10 psi	82.16 psi	0.61	OK
+0.90D	5.46 psi	5.46 psi	33.43 psi	82.16 psi	0.41	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	52.01 psi	52.01 psi	52.01 psi	82.16 psi	0.63	OK
+1.20D+0.50Lr+1.60L	54.45 psi	54.45 psi	54.45 psi	82.16 psi	0.66	OK
+1.20D+1.60L	50.90 psi	50.90 psi	50.90 psi	82.16 psi	0.62	OK
+1.20D+1.60Lr+0.50L	57.90 psi	57.90 psi	57.90 psi	82.16 psi	0.70	OK
+1.20D+1.60Lr	55.92 psi	55.92 psi	55.92 psi	82.16 psi	0.68	OK
+1.20D+0.50L	46.56 psi	46.56 psi	46.56 psi	82.16 psi	0.57	OK
+1.20D	44.58 psi	44.58 psi	44.58 psi	82.16 psi	0.54	OK
+1.20D+0.50Lr+0.50L	50.10 psi	50.10 psi	50.10 psi	82.16 psi	0.61	OK
+0.90D	33.43 psi	33.43 psi	33.43 psi	82.16 psi	0.41	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	66.41 psi	123.24psi	0.5388	OK
+1.20D+0.50Lr+1.60L	69.52 psi	123.24psi	0.5641	OK
+1.20D+1.60L	65.00 psi	123.24psi	0.5274	OK
+1.20D+1.60Lr+0.50L	73.93 psi	123.24psi	0.5999	OK
+1.20D+1.60Lr	71.41 psi	123.24psi	0.5794	OK
+1.20D+0.50L	59.44 psi	123.24psi	0.4823	OK
+1.20D	56.92 psi	123.24psi	0.4619	OK
+1.20D+0.50Lr+0.50L	63.97 psi	123.24psi	0.5191	OK
+0.90D	42.69 psi	123.24psi	0.3464	OK

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F5 @ C7/2B-13/2B-12/2B-8**Code References**

Calculations per ACI 318-14, IBC 2018, CBC 2019

Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

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	=	2.0 ft
Allow press. increase per foot of depth when footing base is below	=	ksf

Increases based on footing plan dimension

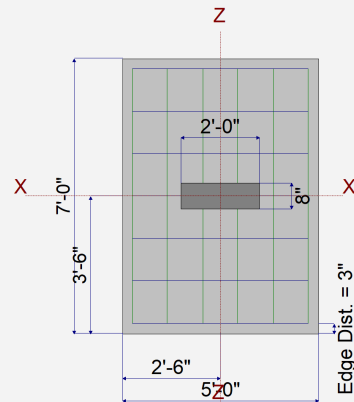
Allowable pressure increase per foot of depth when max. length or width is greater than	=	ksf
	=	ft

Dimensions

Width parallel to X-X Axis	=	5.0 ft
Length parallel to Z-Z Axis	=	7.0 ft
Footing Thickness	=	12.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	24.0 in
pz : parallel to Z-Z Axis	=	8.0 in
Height	=	12.0 in
Rebar Centerline to Edge of Concrete... at Bottom of footing	=	3.0 in

**Reinforcing**

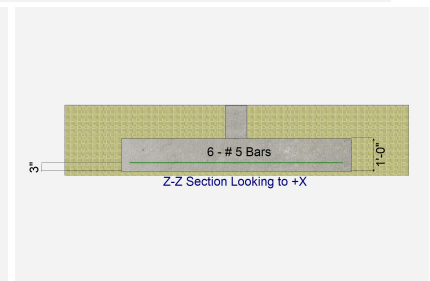
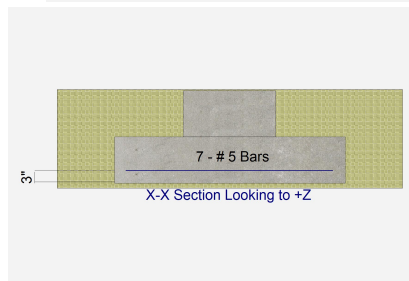
Bars parallel to X-X Axis	=	7.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5
Bars parallel to Z-Z Axis	=	6.0
Number of Bars	=	# 5
Reinforcing Bar Size	=	# 5

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation

Bars required within zone

Bars required on each side of zone

**Applied Loads**

	D	Lr	L	S	W	E	H
P : Column Load	=	48.040	9.190	5.830			k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Project File: MILO - 041525.ec6

LIC#: KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

(c) ENERCALC, LLC 1982-2025

DESCRIPTION: F5 @ C7/2B-13/2B-12/2B-8**DESIGN SUMMARY****Design OK**

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6483	Soil Bearing	1.945 ksf	3.0 ksf	+D+0.750Lr+0.750L 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1990	Z Flexure (+X)	2.414 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.1990	Z Flexure (-X)	2.414 k-ft/ft	12.131 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.7441	X Flexure (+Z)	10.757 k-ft/ft	14.455 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.7441	X Flexure (-Z)	10.757 k-ft/ft	14.455 k-ft/ft	+1.20D+1.60Lr+0.50L
PASS	0.1813	1-way Shear (+X)	14.899 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.1813	1-way Shear (-X)	14.899 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.5924	1-way Shear (+Z)	48.670 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.5924	1-way Shear (-Z)	48.670 psi	82.158 psi	+1.20D+1.60Lr+0.50L
PASS	0.5435	2-way Punching	74.424 psi	136.931 psi	+1.20D+1.60Lr+0.50L

Detailed Results**Soil Bearing**

Rotation Axis & Load Combination...	Gross Allowable	Xecc		Zecc		Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				(in)		Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	3.0	n/a	0.0			1.623	1.623	n/a	n/a	0.541
X-X, +D+L	3.0	n/a	0.0			1.790	1.790	n/a	n/a	0.597
X-X, +D+Lr	3.0	n/a	0.0			1.886	1.886	n/a	n/a	0.629
X-X, +D+0.750Lr+0.750L	3.0	n/a	0.0			1.945	1.945	n/a	n/a	0.648
X-X, +D+0.750L	3.0	n/a	0.0			1.748	1.748	n/a	n/a	0.583
X-X, +0.60D	3.0	n/a	0.0			0.9740	0.9740	n/a	n/a	0.325
Z-Z, D Only	3.0	0.0	n/a			n/a	n/a	1.623	1.623	0.541
Z-Z, +D+L	3.0	0.0	n/a			n/a	n/a	1.790	1.790	0.597
Z-Z, +D+Lr	3.0	0.0	n/a			n/a	n/a	1.886	1.886	0.629
Z-Z, +D+0.750Lr+0.750L	3.0	0.0	n/a			n/a	n/a	1.945	1.945	0.648
Z-Z, +D+0.750L	3.0	0.0	n/a			n/a	n/a	1.748	1.748	0.583
Z-Z, +0.60D	3.0	0.0	n/a			n/a	n/a	0.9740	0.9740	0.325

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	9.605	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.40D	9.605	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+1.60L	10.227	+Z	Bottom	0.2599	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+1.60L	10.227	-Z	Bottom	0.2599	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60L	9.569	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+1.60L	9.569	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+1.60Lr+0.50L	10.757	+Z	Bottom	0.2738	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr+0.50L	10.757	-Z	Bottom	0.2738	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr	10.339	+Z	Bottom	0.2628	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+1.60Lr	10.339	-Z	Bottom	0.2628	Applied Mu	0.3720	14.455	OK
X-X, +1.20D+0.50L	8.650	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+0.50L	8.650	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D	8.233	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK

General Footing

Project File: MILO - 041525.ec6

LIC# : KW-06017089, Build:20.24.12.17

ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F5 @ C7/2B-13/2B-12/2B-8**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, +1.20D	8.233	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+0.50L	9.309	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +1.20D+0.50Lr+0.50L	9.309	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +0.90D	6.175	+Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
X-X, +0.90D	6.175	-Z	Bottom	0.2592	ACI 7.6.1.1	0.3720	14.455	OK
Z-Z, +1.40D	2.155	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.40D	2.155	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	2.295	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+1.60L	2.295	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	2.147	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60L	2.147	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	2.414	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr+0.50L	2.414	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	2.320	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+1.60Lr	2.320	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.941	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50L	1.941	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.847	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D	1.847	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	2.089	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +1.20D+0.50Lr+0.50L	2.089	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.385	-X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK
Z-Z, +0.90D	1.385	+X	Bottom	0.2592	ACI 7.6.1.1	0.310	12.131	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	13.30 psi	13.30 psi	43.46 psi	82.16 psi	0.53	OK
+1.20D+0.50Lr+1.60L	14.17 psi	14.17 psi	46.28 psi	82.16 psi	0.56	OK
+1.20D+1.60L	13.25 psi	13.25 psi	43.30 psi	82.16 psi	0.53	OK
+1.20D+1.60Lr+0.50L	14.90 psi	14.90 psi	48.67 psi	82.16 psi	0.59	OK
+1.20D+1.60Lr	14.32 psi	14.32 psi	46.78 psi	82.16 psi	0.57	OK
+1.20D+0.50L	11.98 psi	11.98 psi	39.14 psi	82.16 psi	0.48	OK
+1.20D	11.40 psi	11.40 psi	37.25 psi	82.16 psi	0.45	OK
+1.20D+0.50Lr+0.50L	12.89 psi	12.89 psi	42.12 psi	82.16 psi	0.51	OK
+0.90D	8.55 psi	8.55 psi	27.94 psi	82.16 psi	0.34	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	43.46 psi	43.46 psi	43.46 psi	82.16 psi	0.53	OK
+1.20D+0.50Lr+1.60L	46.28 psi	46.28 psi	46.28 psi	82.16 psi	0.56	OK
+1.20D+1.60L	43.30 psi	43.30 psi	43.30 psi	82.16 psi	0.53	OK
+1.20D+1.60Lr+0.50L	48.67 psi	48.67 psi	48.67 psi	82.16 psi	0.59	OK
+1.20D+1.60Lr	46.78 psi	46.78 psi	46.78 psi	82.16 psi	0.57	OK
+1.20D+0.50L	39.14 psi	39.14 psi	39.14 psi	82.16 psi	0.48	OK
+1.20D	37.25 psi	37.25 psi	37.25 psi	82.16 psi	0.45	OK
+1.20D+0.50Lr+0.50L	42.12 psi	42.12 psi	42.12 psi	82.16 psi	0.51	OK
+0.90D	27.94 psi	27.94 psi	27.94 psi	82.16 psi	0.34	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	66.46 psi	136.93psi	0.4853	OK
+1.20D+0.50Lr+1.60L	70.76 psi	136.93psi	0.5168	OK
+1.20D+1.60L	66.21 psi	136.93psi	0.4835	OK
+1.20D+1.60Lr+0.50L	74.42 psi	136.93psi	0.5435	OK
+1.20D+1.60Lr	71.53 psi	136.93psi	0.5224	OK
+1.20D+0.50L	59.85 psi	136.93psi	0.4371	OK
+1.20D	56.96 psi	136.93psi	0.416	OK
+1.20D+0.50Lr+0.50L	64.40 psi	136.93psi	0.4703	OK
+0.90D	42.72 psi	136.93psi	0.312	OK

Combined Footing

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DESCRIPTION: F6

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019
Load Combinations Used : ASCE 7-22 / IBC 2024 (L<=100psf)

General Information

Material Properties			Analysis/Design Settings	
f'c : Concrete 28 day strength		3.0 ksi	Calculate footing weight as dead load ?	Yes
fy : Rebar Yield		60.0 ksi	Calculate Pedestal weight as dead load ?	No
Ec : Concrete Elastic Modulus		3,122.0 ksi	Min Steel % Bending Reinf (based on 'd')	
Concrete Density		145.0 pcf	Min Allow % Temp Reinf (based on thick)	0.00180
ϕ : Phi Values	Flexure :	0.90	Min. Overturning Safety Factor	1.0: 1
	Shear :	0.750	Min. Sliding Safety Factor	1.0: 1

Soil Information

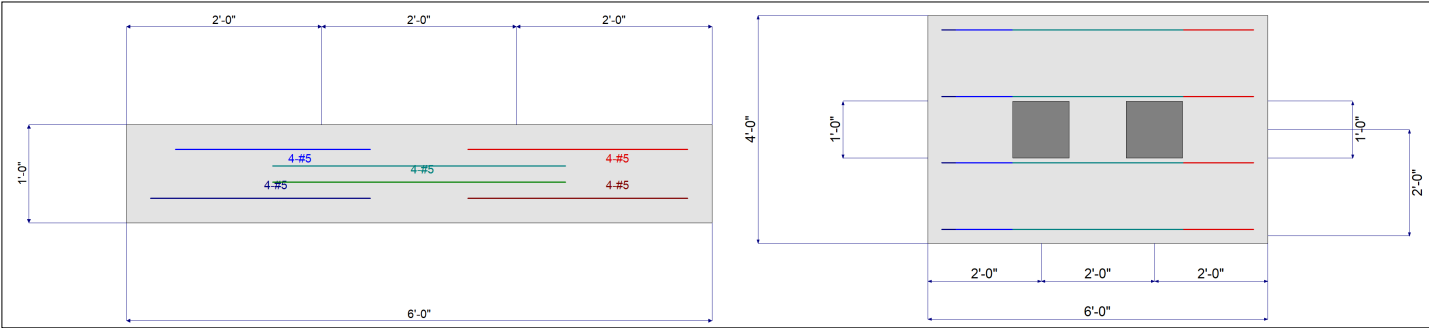
Allowable Soil Bearing	3.0 ksf	Soil Bearing Increase	
Increase Bearing By Footing Weight	No	Footing base depth below soil surface	2.0 ft
Soil Passive Sliding Resistance	250.0 pcf	Increases based on footing Depth	
(Uses entry for "Footing base depth below soil surface" for force)		Allowable pressure increase per foot	ksf
		when base of footing is below	ft
Coefficient of Soil/Concrete Friction	0.30	Increases based on footing Width . . .	
		Allowable pressure increase per foot	ksf
		when maximum length or width is greater tha	ft
		Maximum Allowed Bearing Pressure	10.0 ksf
		(A value of zero implies no limit)	
		Adjusted Allowable Soil Bearing	ksf
		(Allowable Soil Bearing adjusted for footing weight and depth & width increases as specified by user.)	

Dimensions & Reinforcing

Distance Left of Column #1	=	2.0 ft	Pedestal dimensions...		Col #1	Col #2	Bars left of Col #1	Count	Size #	As Provided	As Req'd
Between Columns	=	2.0 ft									
Distance Right of Column #2	=	2.0 ft	Sq. Dim. =	12.0	12.0 in	in	Bottom Bars	4.0	5	1.240	1.037 in^2
Total Footing Length	=	ft	Height =				Top Bars	4.0	5	1.240	0.0 in^2
Footing Width	=	4.0 ft	Bars Btwn Cols				Bottom Bars	4.0	5	1.240	1.037 in^2
Footing Thickness	=	12.0 in					Top Bars	4.0	5	1.240	0.0 in^2
Rebar Center to Concrete Edge @ Top	=	3.0 in	Bars Right of Col #2				Bottom Bars	4.0	5	1.240	1.037 in^2
Rebar Center to Concrete Edge @ Bottom	=	3.0 in					Top Bars	4.0	5	1.240	1.037 in^2

Applied Loads

Applied @ Left Column	D	Lr	L	S	W	E	H
Axial Load Downward	=	6.50	1.250				k
Moment (+CW)	=						k-ft
Shear (+X)	=						k
Applied @ Right Column							
Axial Load Downward	=	2.250	1.10				k
Moment (+CW)	=	0.0	0.0				k-ft
Shear (+X)	=						k
Overburden	=						



Combined Footing

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ALEX KONDRAT & ASSOCIATES INC

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DESCRIPTION: F6**DESIGN SUMMARY****Design OK**

Factor of Safety	Item	Applied	Capacity	Governing Load Combination
PASS	No OTM	Overturning	0.0 k-ft	No OTM
PASS	No Sliding	Sliding	0.0 k	No Sliding
PASS	No Uplift	Uplift	0.0 k	No Uplift

Utilization Ratio	Item	Applied	Capacity	Governing Load Combination	
PASS	0.296	Soil Bearing	0.8894 ksf	3.0 ksf	+D+Lr
PASS	0.067	1-way Shear - Col #1	5.5 psi	82.2 psi	+1.20D+1.60Lr
PASS	0.046	1-way Shear - Col #2	3.8 psi	82.2 psi	+1.40D
PASS	0.057	2-way Punching - Col #1	9.4 psi	164.3 psi	+1.20D+1.60Lr
PASS	0.061	2-way Punching - Col #2	9.4 psi	164.3 psi	+1.20D+1.60Lr
PASS	No Bending	Flexure - Left of Col #1 - Top	0.0 k-ft	0.0 k-ft	N/A
PASS	0.068	Flexure - Left of Col #1 - Bottom	3.310 k-ft	48.524 k-ft	+1.20D+1.60Lr
PASS	No Bending	Flexure - Between Cols - Top	0.0 k-ft	0.0 k-ft	N/A
PASS	0.088	Flexure - Between Cols - Bottom	4.259 k-ft	48.524 k-ft	+1.20D+1.60Lr
PASS	0.000	Flexure - Right of Col #2 - Top	-0.01110 k-ft	48.524 k-ft	+1.40D
PASS	0.033	Flexure - Right of Col #2 - Bottom	1.605 k-ft	48.524 k-ft	+1.20D+1.60Lr

Soil Bearing

Load Combination...	Total Bearing	Eccentricity from Ftg CL	Actual Soil Bearing Stress		Allowable	Actual / Allow Ratio
			@ Left Edge	@ Right Edge		
D Only	14.61 k	-0.291 ft	0.79 ksf	0.43 ksf	3.00 ksf	0.262
+D+Lr	16.96 k	-0.259 ft	0.89 ksf	0.52 ksf	3.00 ksf	0.296
+D+0.750Lr	16.37 k	-0.267 ft	0.86 ksf	0.50 ksf	3.00 ksf	0.288
+0.60D	9.71 k	-0.263 ft	0.51 ksf	0.30 ksf	3.00 ksf	0.170

Overturning Stability

Load Combination...	Moments about Left Edge k-ft			Moments about Right Edge k-ft		
	Overturning	Resisting	Ratio	Overturning	Resisting	Ratio
D Only	0.00	0.00	999.000	0.00	0.00	999.000
+D+Lr	0.00	0.00	999.000	0.00	0.00	999.000
+D+0.750Lr	0.00	0.00	999.000	0.00	0.00	999.000
+0.60D	0.00	0.00	999.000	0.00	0.00	999.000

Sliding Stability

Load Combination...	Sliding Force	Resisting Force	Sliding Safety Ratio
D Only	0.00 k	5.90 k	999
+D+Lr	0.00 k	6.60 k	999
+D+0.750Lr	0.00 k	6.42 k	999
+0.60D	0.00 k	4.14 k	999