

DB ENGINEERING
2021 The Alameda, Suite 360
San Jose, CA 95126
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STRUCTURAL CALCULATIONS

PROJECT No.: 21256

PROJECT: Remodel
1137 Via Jose
San Jose, CA 95120

CLIENT: ---

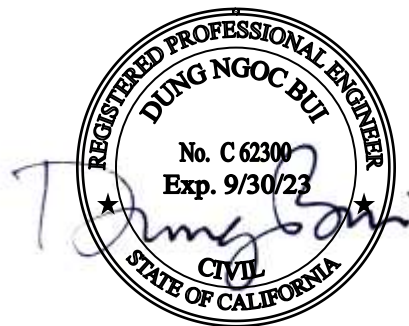
OWNER: ---

DESIGNED BY: Dung Bui, PE

REFERENCES:

- 2019 California Building Code
- Architectural Drawings by Michael Radu

DATE: 12/2021



WEIGHT TAKE-OFF					
				DL (psf)	LL (psf)
ROOF				8.0	20.0
	Roofing	Comp. Shingles	4.0		
	Sheathing	15/32"	2.0		
	Roof Framing	2 X 10 @ 16" o.c.	2.0		
CEILING					
	Ceiling Framing		2.0	6.0	10.0
	Insulation		0.5		
	Ceiling Finishes	Gypboard	2.5		
	Miscellaneous		1.0		
EXT. WALL				17.0	
	Exterior Finish	Stucco	10.0		
	Sheathing	15/32"	1.5		
	Framing	2 X 4 @ 16" o.c.	1.5		
	Insulation		0.5		
	Interior	Gypboard	2.5		
	Miscellaneous		1.0		
INT. WALL				9.0	
	Framing	2 x 4 @ 16" O.C.	2.0		
	Insulation		1.0		
	Ceiling Finishes	Gypboard	5.0		
	Miscellaneous		1.0		
FLOOR				10.0	40.0
	Flooring		5.0		
	Subfloor		2.0		
	Framing		2.0		
	Miscellaneous		1.0		

Wood Beam

Lic. #: KW-06006134

DESCRIPTION: ROOF RAFTER

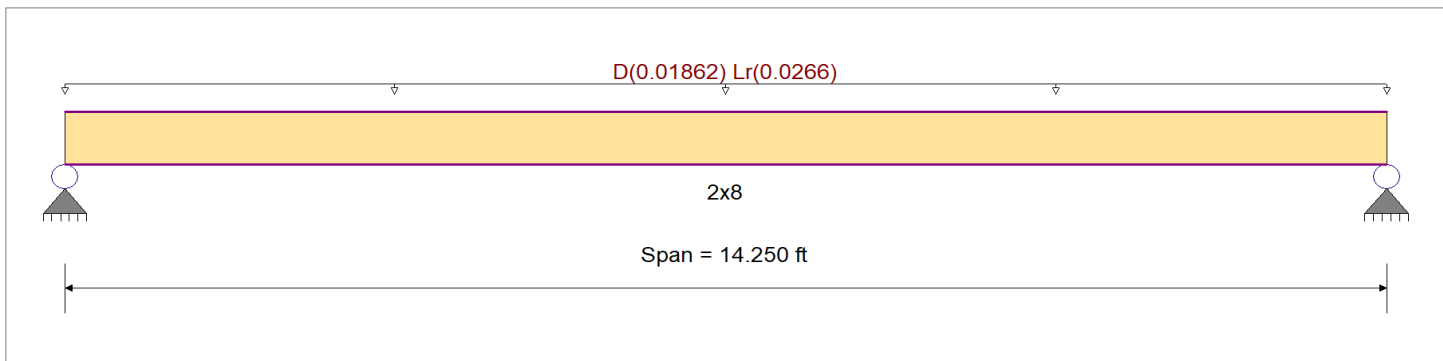
CODE REFERENCES

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

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	900 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	900 psi	Ebend- xx
	Fc - Prll	1350 psi	Eminbend - xx
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi	
Wood Grade : No.2	Fv	180 psi	Density
	Ft	575 psi	Repetitive Member Stress Increase
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			31.21 pcf



Applied Loads

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

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.675 : 1	Maximum Shear Stress Ratio =	0.182 : 1
Section used for this span	2x8	Section used for this span	2x8
fb: Actual =	1,048.18 psi	fv: Actual =	40.87 psi
Fb: Allowable =	1,552.50 psi	Fv: Allowable =	225.00 psi
Load Combination	+D+Lr+H	Load Combination	+D+Lr+H
Location of maximum on span =	7.125 ft	Location of maximum on span =	13.678 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.326 in	Ratio =	525 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.554 in	Ratio =	308 >=180
Max Upward Total Deflection	0.000 in	Ratio =	0 <180

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values				
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+H	Length = 14.250 ft	1	0.386	0.104	0.90	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1117.80	0.00	0.00	0.00	0.00
+D+L+H	Length = 14.250 ft	1	0.348	0.093	1.00	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1242.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 14.250 ft	1	0.675	0.182	1.25	1.200	1.00	1.15	1.00	1.00	1.00	1.15	1,048.18	1552.50	0.00	0.00	0.00	0.00
+D+S+H	Length = 14.250 ft	1	0.302	0.081	1.15	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1428.30	0.00	0.00	0.00	0.00
+D+0.750Lr+0.750L+H	Length = 14.250 ft	1	0.576	0.155	1.25	1.200	1.00	1.15	1.00	1.00	1.00	0.98	894.04	1552.50	0.00	0.00	0.00	0.00
+D+0.750L+0.750S+H	Length = 14.250 ft	1	0.302	0.081	1.15	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1428.30	0.00	0.00	0.00	0.00
+D+0.60W+H	Length = 14.250 ft	1	0.217	0.058	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1987.20	0.00	0.00	0.00	0.00

Wood Beam

Lic. #: KW-06006134

DB ENGINEERING

DESCRIPTION: ROOF RAFTER

Load Combination	Segment Length	Span #	Max Stress Ratios		C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	Moment Values			Shear Values				
			M	V								M	fb	F'b	V	fv	F'v		
+D+0.750Lr+0.750L+0.450W+H	Length = 14.250 ft	1	0.450	0.121	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.98	894.04	1987.20	0.00	0.00	0.00	0.00	288.00
+D+0.750L+0.750S+0.450W+H	Length = 14.250 ft	1	0.217	0.058	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1987.20	0.00	0.00	0.00	0.00	288.00
+0.60D+0.60W+0.60H	Length = 14.250 ft	1	0.130	0.035	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.28	258.96	1987.20	0.00	0.00	0.00	0.00	288.00
+D+0.70E+0.60H	Length = 14.250 ft	1	0.217	0.058	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1987.20	0.00	0.00	0.00	0.00	288.00
+D+0.750L+0.750S+0.5250E+H	Length = 14.250 ft	1	0.217	0.058	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.47	431.60	1987.20	0.00	0.00	0.00	0.00	288.00
+0.60D+0.70E+H	Length = 14.250 ft	1	0.130	0.035	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.28	258.96	1987.20	0.00	0.00	0.00	0.00	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr+H	1	0.5537	7.177		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.322	0.322
Overall MINimum	0.190	0.190
+D+H	0.133	0.133
+D+L+H	0.133	0.133
+D+Lr+H	0.322	0.322
+D+S+H	0.133	0.133
+D+0.750Lr+0.750L+H	0.275	0.275
+D+0.750L+0.750S+H	0.133	0.133
+D+0.60W+H	0.133	0.133
+D+0.750Lr+0.750L+0.450W+H	0.275	0.275
+D+0.750L+0.750S+0.450W+H	0.133	0.133
+0.60D+0.60W+0.60H	0.080	0.080
+D+0.70E+0.60H	0.133	0.133
+D+0.750L+0.750S+0.5250E+H	0.133	0.133
+0.60D+0.70E+H	0.080	0.080
D Only	0.133	0.133
Lr Only	0.190	0.190
H Only		

Wood Beam

Lic. #: KW-06006134

DESCRIPTION: RIDGE BEAM

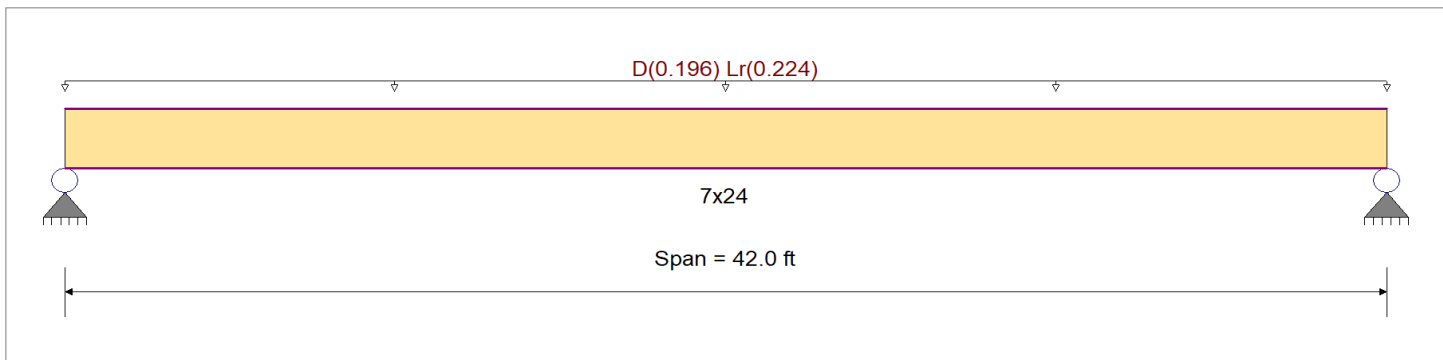
CODE REFERENCES

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

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : iLevel Truss Joist	Fc - Perp	750.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load : D = 0.0140, Lr = 0.0160 ksf, Tributary Width = 14.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.554	1	Maximum Shear Stress Ratio	=	0.221	1
Section used for this span	=	7x24		Section used for this span	=	7x24	
fb: Actual	=	1,860.79 psi		fv: Actual	=	80.20 psi	
Fb: Allowable	=	3,356.55 psi		Fv: Allowable	=	362.50 psi	
Load Combination	=	+D+Lr+H		Load Combination	=	+D+Lr+H	
Location of maximum on span	=	+21.000ft		Location of maximum on span	=	0.000ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.889 in	Ratio =	566	>=	360	
Max Upward Transient Deflection		0.000 in	Ratio =	0	<	360	
Max Downward Total Deflection		1.876 in	Ratio =	268	>=	180	
Max Upward Total Deflection		0.000 in	Ratio =	0	<	180	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values							
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v					
+D+H	Length = 42.0 ft	1	0.405	0.162	0.90	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	2416.72	0.00	0.00	0.00	0.00	0.00	261.00	
+D+L+H	Length = 42.0 ft	1	0.365	0.145	1.00	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	2685.24	0.00	0.00	0.00	0.00	0.00	0.00	290.00
+D+Lr+H	Length = 42.0 ft	1	0.554	0.221	1.25	0.926	1.00	1.00	1.00	1.00	1.00	1.00	104.20	1,860.79	3356.55	0.00	0.00	0.00	8.98	80.20	362.50	
+D+S+H	Length = 42.0 ft	1	0.317	0.126	1.15	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	3088.03	0.00	0.00	0.00	4.72	42.19	333.50	
+D+0.750Lr+0.750L+H	Length = 42.0 ft	1	0.489	0.195	1.25	0.926	1.00	1.00	1.00	1.00	1.00	1.00	91.86	1,640.29	3356.55	0.00	0.00	0.00	7.92	70.70	362.50	
+D+0.750L+0.750S+H	Length = 42.0 ft	1	0.317	0.126	1.15	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	3088.03	0.00	0.00	0.00	4.72	42.19	333.50	
+D+0.60W+H						0.926	1.00	1.00	1.00	1.00	1.00				0.00			0.00	0.00	0.00	0.00	

Wood Beam

Lic. #: KW-06006134

DB ENGINEERING

DESCRIPTION: RIDGE BEAM

Load Combination	Segment Length	Span #	Max Stress Ratios		Moment Values							Shear Values					
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
Length = 42.0 ft	1	0.228	0.091	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	4296.39	4.72	42.19	464.00
+D+0.750Lr+0.750L+0.450W+H					0.926	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 42.0 ft	1	0.382	0.152	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	91.86	1,640.29	4296.39	7.92	70.70	464.00
+D+0.750L+0.750S+0.450W+H					0.926	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 42.0 ft	1	0.228	0.091	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	4296.39	4.72	42.19	464.00
+0.60D+0.60W+0.60H					0.926	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 42.0 ft	1	0.137	0.055	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	32.89	587.27	4296.39	2.83	25.31	464.00
+D+0.70E+0.60H					0.926	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 42.0 ft	1	0.228	0.091	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	4296.39	4.72	42.19	464.00
+D+0.750L+0.750S+0.5250E+H					0.926	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 42.0 ft	1	0.228	0.091	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	54.81	978.79	4296.39	4.72	42.19	464.00
+0.60D+0.70E+H					0.926	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 42.0 ft	1	0.137	0.055	1.60	0.926	1.00	1.00	1.00	1.00	1.00	1.00	32.89	587.27	4296.39	2.83	25.31	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr+H	1	1.8759	21.153		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	9.924	9.924
Overall MINimum	4.704	4.704
+D+H	5.220	5.220
+D+L+H	5.220	5.220
+D+Lr+H	9.924	9.924
+D+S+H	5.220	5.220
+D+0.750Lr+0.750L+H	8.748	8.748
+D+0.750L+0.750S+H	5.220	5.220
+D+0.60W+H	5.220	5.220
+D+0.750Lr+0.750L+0.450W+H	8.748	8.748
+D+0.750L+0.750S+0.450W+H	5.220	5.220
+0.60D+0.60W+0.60H	3.132	3.132
+D+0.70E+0.60H	5.220	5.220
+D+0.750L+0.750S+0.5250E+H	5.220	5.220
+0.60D+0.70E+H	3.132	3.132
D Only	5.220	5.220
Lr Only	4.704	4.704
H Only		

Wood Beam

Lic. #: KW-06006134

DESCRIPTION: CEILING BEAM (1)

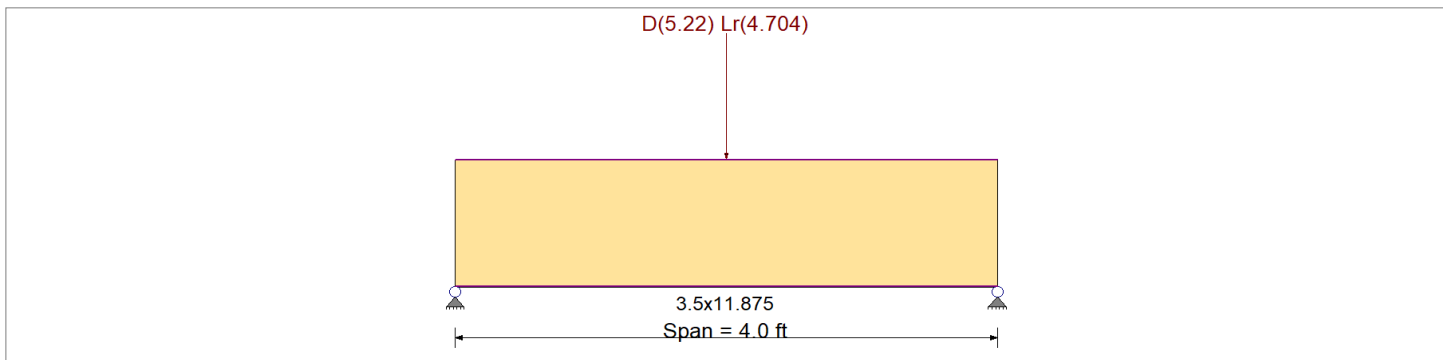
CODE REFERENCES

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

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination : ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : iLevel Truss Joist	Fc - Perp	750.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

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

Beam self weight calculated and added to loads

Point Load : D = 5.220, Lr = 4.704 k @ 2.0 ft, (RIDGE BEAM)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.400 : 1	Maximum Shear Stress Ratio	=	0.495 : 1
Section used for this span	=	3.5x11.875	Section used for this span	=	3.5x11.875
fb: Actual	=	1,451.51 psi	fv: Actual	=	179.56 psi
Fb: Allowable	=	3,625.00 psi	Fv: Allowable	=	362.50 psi
Load Combination	=	+D+Lr+H	Load Combination	=	+D+Lr+H
Location of maximum on span	=	2.000ft	Location of maximum on span	=	3.022 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.010 in	Ratio =		4732 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.021 in	Ratio =		2236 >=180
Max Upward Total Deflection		0.000 in	Ratio =		0 <180

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values									
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v							
+D+H	Length = 4.0 ft	1	0.293	0.363	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	2610.00	0.00	0.00	0.00	2.62	94.68	261.00	
+D+L+H	Length = 4.0 ft	1	0.264	0.326	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	2900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 4.0 ft	1	0.400	0.495	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	9.95	1,451.51	3625.00	0.00	0.00	0.00	4.98	179.56	362.50	
+D+S+H	Length = 4.0 ft	1	0.229	0.284	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	3335.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+0.750Lr+0.750L+H	Length = 4.0 ft	1	0.353	0.437	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8.77	1,279.96	3625.00	0.00	0.00	0.00	4.39	158.34	362.50	
+D+0.750L+0.750S+H	Length = 4.0 ft	1	0.229	0.284	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	3335.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				0.00	0.00	0.00	0.00	0.00	0.00	0.00

Wood Beam

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DB ENGINEERING

DESCRIPTION: CEILING BEAM (1)

Load Combination	Segment Length	Span #	Max Stress Ratios		C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	Moment Values			Shear Values		
			M	V								M	fb	F'b	V	fv	F'v
Length = 4.0 ft	1	0.165	0.204	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	4640.00	2.62	94.68	464.00
+D+0.750Lr+0.750L+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.276	0.341	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	8.77	1,279.96	4640.00	4.39	158.34	464.00
+D+0.750L+0.750S+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.165	0.204	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	4640.00	2.62	94.68	464.00
+0.60D+0.60W+0.60H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.099	0.122	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	3.15	459.17	4640.00	1.57	56.81	464.00
+D+0.70E+0.60H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.165	0.204	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	4640.00	2.62	94.68	464.00
+D+0.750L+0.750S+0.5250E+H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.165	0.204	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.25	765.29	4640.00	2.62	94.68	464.00
+0.60D+0.70E+H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.099	0.122	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	3.15	459.17	4640.00	1.57	56.81	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr+H	1	0.0215	2.015		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.988	4.988
Overall MINimum	2.352	2.352
+D+H	2.636	2.636
+D+L+H	2.636	2.636
+D+Lr+H	4.988	4.988
+D+S+H	2.636	2.636
+D+0.750Lr+0.750L+H	4.400	4.400
+D+0.750L+0.750S+H	2.636	2.636
+D+0.60W+H	2.636	2.636
+D+0.750Lr+0.750L+0.450W+H	4.400	4.400
+D+0.750L+0.750S+0.450W+H	2.636	2.636
+0.60D+0.60W+0.60H	1.582	1.582
+D+0.70E+0.60H	2.636	2.636
+D+0.750L+0.750S+0.5250E+H	2.636	2.636
+0.60D+0.70E+H	1.582	1.582
D Only	2.636	2.636
Lr Only	2.352	2.352
H Only		

Wood Beam

Lic. #: KW-06006134

DESCRIPTION: CEILING BEAM (2)

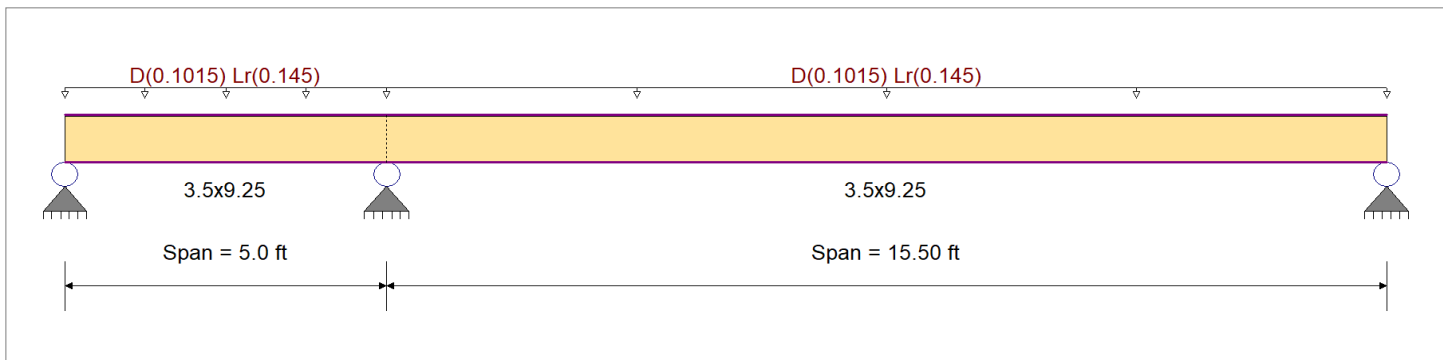
CODE REFERENCES

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

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : iLevel Truss Joist	Fc - Perp	750.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

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

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 7.250 ft, (ROOF)

Load for Span Number 2

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 7.250 ft, (ROOF)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.399	1	Maximum Shear Stress Ratio	=	0.281	: 1
Section used for this span		3.5x9.25		Section used for this span		3.5x9.25	
fb: Actual	=	1,448.05 psi		fv: Actual	=	101.92 psi	
Fb: Allowable	=	3,625.00 psi		Fv: Allowable	=	362.50 psi	
Load Combination		+D+Lr+H, LL Comb Run (LL)		Load Combination		+D+Lr+H, LL Comb Run (LL)	
Location of maximum on span	=	5.000ft		Location of maximum on span	=	5.000ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.206 in	Ratio =	902	>=	360	
Max Upward Transient Deflection		-0.018 in	Ratio =	3315	>=	360	
Max Downward Total Deflection		0.361 in	Ratio =	515	>=	180	
Max Upward Total Deflection		-0.029 in	Ratio =	2035	>=	180	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values				
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+H																		
Length = 5.0 ft	1		0.241	0.170	0.90	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2610.00	0.00	0.00	0.00	0.00
Length = 15.50 ft	2		0.241	0.170	0.90	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2610.00	0.96	44.33	261.00	261.00
+D+L+H, LL Comb Run (*L)																		
Length = 5.0 ft	1		0.217	0.153	1.00	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2900.00	0.96	44.33	290.00	290.00
Length = 15.50 ft	2		0.217	0.153	1.00	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2900.00	0.96	44.33	290.00	290.00
+D+L+H, LL Comb Run (L*)																		
Length = 5.0 ft	1		0.217	0.153	1.00	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2900.00	0.96	44.33	290.00	290.00
Length = 15.50 ft	2		0.217	0.153	1.00	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2900.00	0.96	44.33	290.00	290.00
+D+L+H, LL Comb Run (LL)																		
						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00

Wood Beam

Lic. # : KW-06006134

DB ENGINEERING

DESCRIPTION: CEILING BEAM (2)

Load Combination	Segment Length	Span #	Max Stress Ratios		C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	Moment Values			Shear Values		
			M	V								M	fb	F'b	V	fv	F'v
Length = 5.0 ft	1		0.217	0.153	1.00	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2900.00	0.96	44.33	290.00
Length = 15.50 ft	2		0.217	0.153	1.00	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	2900.00	0.96	44.33	290.00
+D+Lr+H, LL Comb Run (*L)						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.392	0.280	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.91	1,421.48	3625.00	2.19	101.59	362.50
Length = 15.50 ft	2		0.392	0.280	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.91	1,421.48	3625.00	2.19	101.59	362.50
+D+Lr+H, LL Comb Run (L*)						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.181	0.127	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.73	656.46	3625.00	0.99	46.06	362.50
Length = 15.50 ft	2		0.181	0.127	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.73	656.46	3625.00	0.96	46.06	362.50
+D+Lr+H, LL Comb Run (LL)						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.399	0.281	1.25	1.000	1.00	1.00	1.00	1.00	1.00	6.02	1,448.05	3625.00	2.20	101.92	362.50
Length = 15.50 ft	2		0.399	0.281	1.25	1.000	1.00	1.00	1.00	1.00	1.00	6.02	1,448.05	3625.00	2.20	101.92	362.50
+D+S+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
Length = 15.50 ft	2		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
+D+0.750Lr+0.750L+H, LL Comb Rt						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.338	0.241	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.09	1,223.58	3625.00	1.88	87.27	362.50
Length = 15.50 ft	2		0.338	0.241	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.09	1,223.58	3625.00	1.88	87.27	362.50
+D+0.750Lr+0.750L+H, LL Comb Rt						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.179	0.123	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.70	649.82	3625.00	0.96	44.58	362.50
Length = 15.50 ft	2		0.179	0.123	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.70	649.82	3625.00	0.96	44.58	362.50
+D+0.750Lr+0.750L+H, LL Comb Rt						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.343	0.241	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.17	1,243.51	3625.00	1.89	87.52	362.50
Length = 15.50 ft	2		0.343	0.241	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.17	1,243.51	3625.00	1.89	87.52	362.50
+D+0.750L+0.750S+H, LL Comb Ru						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
Length = 15.50 ft	2		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
+D+0.750L+0.750S+H, LL Comb Ru						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
Length = 15.50 ft	2		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
+D+0.750L+0.750S+H, LL Comb Ru						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
Length = 15.50 ft	2		0.189	0.133	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	3335.00	0.96	44.33	333.50
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+D+0.750Lr+0.750L+0.450W+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.264	0.188	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.09	1,223.58	4640.00	1.88	87.27	464.00
Length = 15.50 ft	2		0.264	0.188	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.09	1,223.58	4640.00	1.88	87.27	464.00
+D+0.750Lr+0.750L+0.450W+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.140	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.70	649.82	4640.00	0.96	44.58	464.00
Length = 15.50 ft	2		0.140	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.70	649.82	4640.00	0.96	44.58	464.00
+D+0.750Lr+0.750L+0.450W+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.268	0.189	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.17	1,243.51	4640.00	1.89	87.52	464.00
Length = 15.50 ft	2		0.268	0.189	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.17	1,243.51	4640.00	1.89	87.52	464.00
+D+0.750L+0.750S+0.450W+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+D+0.750L+0.750S+0.450W+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+D+0.750L+0.750S+0.450W+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+0.60D+0.60W+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.081	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.57	377.93	4640.00	0.57	26.60	464.00
Length = 15.50 ft	2		0.081	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.57	377.93	4640.00	0.57	26.60	464.00
+D+0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+D+0.750L+0.750S+0.5250E+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Wood Beam

Lic. # : KW-06006134

DB ENGINEERING

DESCRIPTION: CEILING BEAM (2)

Load Combination	Segment Length	Span #	Max Stress Ratios		Moment Values							Shear Values					
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+D+0.750L+0.750S+0.5250E+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+D+0.750L+0.750S+0.5250E+H, LL						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
Length = 15.50 ft	2		0.136	0.096	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.62	629.89	4640.00	0.96	44.33	464.00
+0.60D+0.70E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 5.0 ft	1		0.081	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.57	377.93	4640.00	0.57	26.60	464.00
Length = 15.50 ft	2		0.081	0.057	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.57	377.93	4640.00	0.57	26.60	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+Lr+H, LL Comb Run (*L)	-0.0295	2.933
+D+Lr+H, LL Comb Run (*L)	2	0.3607	8.573		0.0000	2.933

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-0.903	4.224	1.607
Overall MINimum	-0.318	2.386	0.904
+D+H	-0.245	1.837	0.696
+D+L+H, LL Comb Run (*L)	-0.245	1.837	0.696
+D+L+H, LL Comb Run (L*)	-0.245	1.837	0.696
+D+L+H, LL Comb Run (LL)	-0.245	1.837	0.696
+D+Lr+H, LL Comb Run (*L)	-0.903	3.832	1.607
+D+Lr+H, LL Comb Run (L*)	0.096	2.229	0.689
+D+Lr+H, LL Comb Run (LL)	-0.563	4.224	1.600
+D+S+H	-0.245	1.837	0.696
+D+0.750Lr+0.750L+H, LL Comb Run (*L)	-0.739	3.333	1.380
+D+0.750Lr+0.750L+H, LL Comb Run (L)	0.010	2.131	0.691
+D+0.750Lr+0.750L+H, LL Comb Run (L)	-0.483	3.627	1.374
+D+0.750L+0.750S+H, LL Comb Run (*L)	-0.245	1.837	0.696
+D+0.750L+0.750S+H, LL Comb Run (L*)	-0.245	1.837	0.696
+D+0.750L+0.750S+H, LL Comb Run (LL)	-0.245	1.837	0.696
+D+0.60W+H	-0.245	1.837	0.696
+D+0.750Lr+0.750L+0.450W+H, LL Comb	-0.739	3.333	1.380
+D+0.750Lr+0.750L+0.450W+H, LL Comb	0.010	2.131	0.691
+D+0.750Lr+0.750L+0.450W+H, LL Comb	-0.483	3.627	1.374
+D+0.750L+0.750S+0.450W+H, LL Comb	-0.245	1.837	0.696
+D+0.750L+0.750S+0.450W+H, LL Comb	-0.245	1.837	0.696
+D+0.750L+0.750S+0.450W+H, LL Comb	-0.245	1.837	0.696
+D+0.750L+0.750S+0.450W+H, LL Comb	-0.245	1.837	0.696
+0.60D+0.60W+0.60H	-0.147	1.102	0.418
+D+0.70E+0.60H	-0.245	1.837	0.696
+D+0.750L+0.750S+0.5250E+H, LL Comb	-0.245	1.837	0.696
+D+0.750L+0.750S+0.5250E+H, LL Comb	-0.245	1.837	0.696
+D+0.750L+0.750S+0.5250E+H, LL Comb	-0.245	1.837	0.696
+0.60D+0.70E+H	-0.147	1.102	0.418
D Only	-0.245	1.837	0.696
Lr Only, LL Comb Run (*L)	-0.658	1.995	0.911
Lr Only, LL Comb Run (L*)	0.340	0.392	-0.007
Lr Only, LL Comb Run (LL)	-0.318	2.386	0.904
H Only			

Wood Beam

Lic. #: KW-06006134

DESCRIPTION: HEADER BEAM (EXT, WALL)

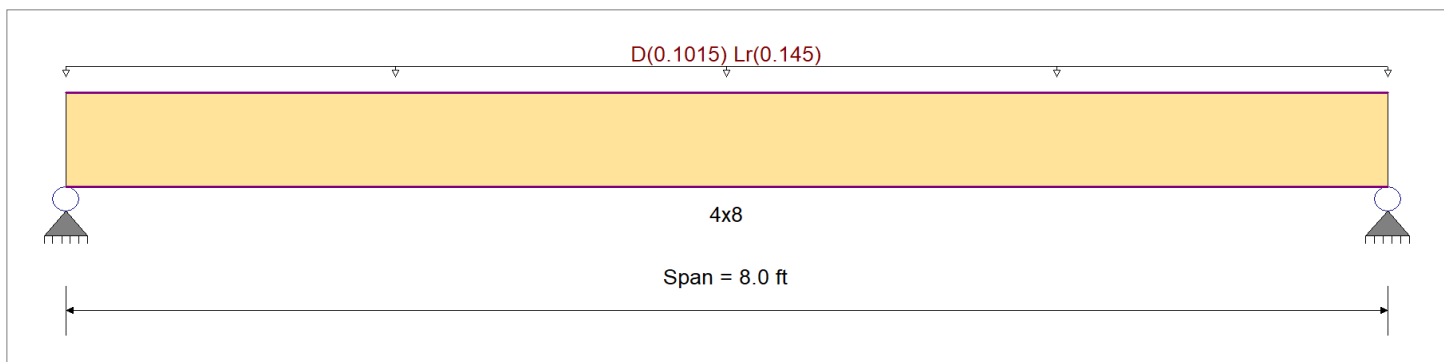
CODE REFERENCES

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

Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1000 psi	E : Modulus of Elasticity	
Load Combination ASCE 7-16	Fb -	1000 psi	Ebend- xx	1700ksi
	Fc - Prll	1500 psi	Eminbend - xx	620ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : No.1	Fv	180 psi		
	Ft	675 psi	Density	31.21pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load : D = 0.0140, Lr = 0.020 ksf, Tributary Width = 7.250 ft, (ROOF)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.486 < 1	Maximum Shear Stress Ratio =	0.226 < 1
Section used for this span =	4x8	Section used for this span =	4x8
fb: Actual =	789.00psi	fv: Actual =	50.89 psi
Fb: Allowable =	1,625.00psi	Fv: Allowable =	225.00 psi
Load Combination =	+D+Lr+H	Load Combination =	+D+Lr+H
Location of maximum on span =	4.000ft	Location of maximum on span =	7.416 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.071 in	Ratio =	1349 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.124 in	Ratio =	776 >=180
Max Upward Total Deflection	0.000 in	Ratio =	0 <180

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values							
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v					
+D+H	Length = 8.0 ft	1	0.286	0.133	0.90	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	1170.00	0.00	0.00	0.00	0.00	0.00	162.00	
+D+L+H	Length = 8.0 ft	1	0.258	0.120	1.00	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	180.00
+D+Lr+H	Length = 8.0 ft	1	0.486	0.226	1.25	1.300	1.00	1.00	1.00	1.00	1.00	1.00	2.02	789.00	1625.00	0.00	0.00	0.00	0.00	0.00	0.00	225.00
+D+S+H	Length = 8.0 ft	1	0.224	0.104	1.15	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	1495.00	0.00	0.00	0.00	0.00	0.00	0.00	207.00
+D+0.750Lr+0.750L+H	Length = 8.0 ft	1	0.416	0.194	1.25	1.300	1.00	1.00	1.00	1.00	1.00	1.00	1.73	675.51	1625.00	0.00	0.00	0.00	0.00	0.00	0.00	225.00
+D+0.750L+0.750S+H	Length = 8.0 ft	1	0.224	0.104	1.15	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	1495.00	0.00	0.00	0.00	0.00	0.00	0.00	207.00
+D+0.60W+H						1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00	0.00	0.00	0.00

Wood Beam

Lic. #: KW-06006134

DB ENGINEERING

DESCRIPTION: HEADER BEAM (EXT, WALL)

Load Combination	Segment Length	Span #	Max Stress Ratios			Moment Values						Shear Values					
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
Length = 8.0 ft	1	0.161	0.075	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	2080.00	0.37	21.61	288.00
+D+0.750Lr+0.750L+0.450W+H					1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.325	0.151	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	1.73	675.51	2080.00	0.74	43.57	288.00
+D+0.750L+0.750S+0.450W+H					1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.161	0.075	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	2080.00	0.37	21.61	288.00
+0.60D+0.60W+0.60H					1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.097	0.045	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.51	201.01	2080.00	0.22	12.96	288.00
+D+0.70E+0.60H					1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.161	0.075	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	2080.00	0.37	21.61	288.00
+D+0.750L+0.750S+0.5250E+H					1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.161	0.075	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.86	335.01	2080.00	0.37	21.61	288.00
+0.60D+0.70E+H					1.300	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.097	0.045	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	0.51	201.01	2080.00	0.22	12.96	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr+H	1	0.1236	4.029		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.008	1.008
Overall MINimum	0.580	0.580
+D+H	0.428	0.428
+D+L+H	0.428	0.428
+D+Lr+H	1.008	1.008
+D+S+H	0.428	0.428
+D+0.750Lr+0.750L+H	0.863	0.863
+D+0.750L+0.750S+H	0.428	0.428
+D+0.60W+H	0.428	0.428
+D+0.750Lr+0.750L+0.450W+H	0.863	0.863
+D+0.750L+0.750S+0.450W+H	0.428	0.428
+0.60D+0.60W+0.60H	0.257	0.257
+D+0.70E+0.60H	0.428	0.428
+D+0.750L+0.750S+0.5250E+H	0.428	0.428
+0.60D+0.70E+H	0.257	0.257
D Only	0.428	0.428
Lr Only	0.580	0.580
H Only		

Wood Column

Lic. # : KW-06006134

DESCRIPTION: POST FOR RIDGE BEAM

Code References

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

Load Combinations Used : ASCE 7-16

General Information

Analysis Method :	Allowable Stress Design			Wood Section Name	6x8
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber
Overall Column Height	13 ft			Wood Member Type	Sawn
<i>(Used for non-slender calculations)</i>					
Wood Species	Douglas Fir-Larch			Exact Width	5.50 in
Wood Grade	No.1			Exact Depth	7.50 in
Fb +	1000 psi	Fv	180 psi	Area	41.250 in^2
Fb -	1000 psi	Ft	675 psi	Ix	193.359 in^4
Fc - Prll	1500 psi	Density	31.21 pcf	Iy	103.984 in^4
Fc - Perp	625 psi				
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial		Allow Stress Modification Factors
	Basic	1700	1700	1700 ksi	Cf or Cv for Bending
	Minimum	620	620		Cf or Cv for Compression
					Cf or Cv for Tension
					Cm : Wet Use Factor
					Ct : Temperature Factor
					Cfu : Flat Use Factor
					Kf : Built-up columns
					Use Cr : Repetitive ?
					1.0 NDS 15.3.2
					No
					Brace condition for deflection (buckling) along columns :
					X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 13 ft, K = 1.0
					Y-Y (depth) axis : Fully braced against buckling ABOUT X-X Axis

Applied Loads

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

Column self weight included : 116.225 lbs * Dead Load Factor

AXIAL LOADS . . .

RIDGE BEAM: Axial Load at 13.0 ft, D = 5.220, Lr = 4.704 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4187 : 1**

Load Combination **+D+Lr**

Governing NDS Formlra **Comp Only, fc/Fc'**

Location of max.above base **0.0 ft**

At maximum location values are . . .

Applied Axial **10.040 k**

Applied Mx **0.0 k-ft**

Applied My **0.0 k-ft**

Fc : Allowable **581.26 psi**

Maximum SERVICE Lateral Load Reactions . .

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

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y	0.0 in	at	0.0 ft	above base
for load combination : n/a				
Along X-X	0.0 in	at	0.0 ft	above base
for load combination : n/a				

PASS Maximum Shear Stress Ratio = **0.0 : 1**

Load Combination **+0.60D**

Location of max.above base **13.0 ft**

Applied Design Shear **0.0 psi**

Allowable Shear **288.0 psi**

Other Factors used to calculate allowable stresses . . .

Bending	Compression	Tension
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Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	0.900	0.412	0.2328	PASS	0.0 ft	0.0	PASS	13.0 ft
+D+Lr	1.250	0.310	0.4187	PASS	0.0 ft	0.0	PASS	13.0 ft
+D+0.750Lr	1.250	0.310	0.3697	PASS	0.0 ft	0.0	PASS	13.0 ft
+0.60D	1.600	0.248	0.1306	PASS	0.0 ft	0.0	PASS	13.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction	My - End Moments		Mx - End Moments	
	@ Base	@ Top	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top
D Only					5.336				
+D+Lr					10.040				
+D+0.750Lr					8.864				

Wood Column

DB ENGINEERING

Lic. # : KW-06006134

DESCRIPTION: POST FOR RIDGE BEAM

Note: Only non-zero reactions are listed.

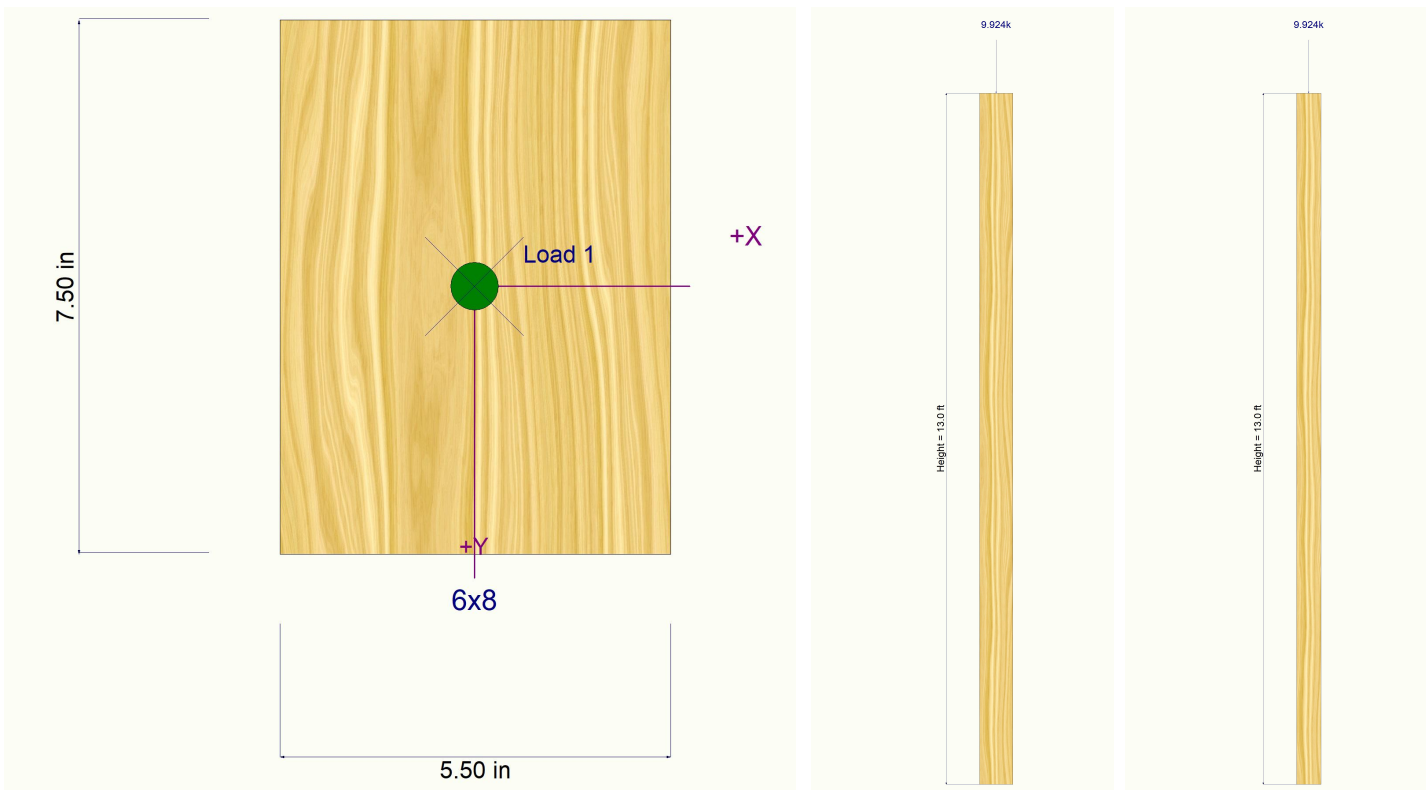
Maximum Reactions

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top		@ Base	@ Top		@ Base	@ Top
+0.60D						3.202					
Lr Only						4.704					

Maximum Deflections for Load Combinations

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

Sketches



General Footing

Lic. #: KW-06006134

DESCRIPTION: RIDGE BEAM

Code References

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

Load Combinations Used : ASCE 7-16

General Information

Material Properties

f_c : Concrete 28 day strength	=	2.50	ksi
f_y : Rebar Yield	=	40.0	ksi
E_c : Concrete Elastic Modulus	=	2,850.0	ksi
Concrete Density	=	145.0	pcf
ϕ Values Flexure	=	0.90	
Shear	=	0.750	

Soil Design Values

Allowable Soil Bearing	=	1.50	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

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

Increases based on footing Depth

Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth when footing base is below	=		ksf

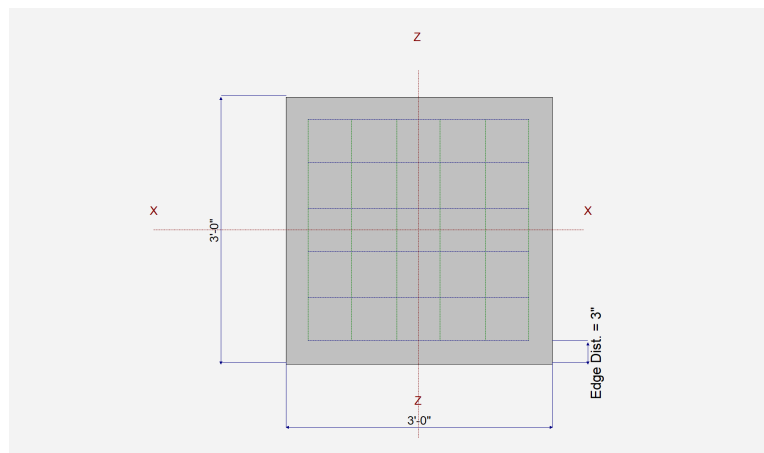
Increases based on footing plan dimension

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

Dimensions

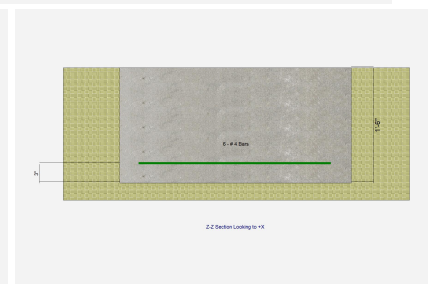
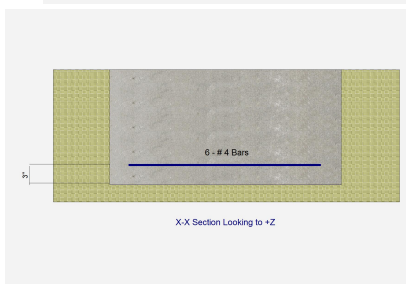
Width parallel to X-X Axis	=	3.0	ft
Length parallel to Z-Z Axis	=	3.0	ft
Footing Thickness	=	18.0	in

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



Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 4
Bars parallel to Z-Z Axis	=	
Number of Bars	=	6
Reinforcing Bar Size	=	# 4
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	=	5.022	4.704				k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Lic. #: KW-06006134

DESCRIPTION: RIDGE BEAM

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8653	Soil Bearing	1.298 ksf	1.50 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.09613	Z Flexure (+X)	1.694 k-ft/ft	17.624 k-ft/ft	+1.20D+1.60Lr
PASS	0.09613	Z Flexure (-X)	1.694 k-ft/ft	17.624 k-ft/ft	+1.20D+1.60Lr
PASS	0.09613	X Flexure (+Z)	1.694 k-ft/ft	17.624 k-ft/ft	+1.20D+1.60Lr
PASS	0.09613	X Flexure (-Z)	1.694 k-ft/ft	17.624 k-ft/ft	+1.20D+1.60Lr
PASS	0.02677	1-way Shear (+X)	2.008 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.02677	1-way Shear (-X)	2.008 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.02677	1-way Shear (+Z)	2.008 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.02677	1-way Shear (-Z)	2.008 psi	75.0 psi	+1.20D+1.60Lr
PASS	0.08268	2-way Punching	12.402 psi	150.0 psi	+1.20D+1.60Lr

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xeccc	Zeccc (in)	Actual Soil Bearing Stress @ Location				Actual / Allow Ratio
				Bottom, -Z	Top, +Z	Left, -X	Right, +X	
X-X, D Only	1.50	n/a	0.0	0.7755	0.7755	n/a	n/a	0.517
X-X, +D+Lr	1.50	n/a	0.0	1.298	1.298	n/a	n/a	0.865
X-X, +D+0.750Lr	1.50	n/a	0.0	1.168	1.168	n/a	n/a	0.779
X-X, +0.60D	1.50	n/a	0.0	0.4653	0.4653	n/a	n/a	0.310
Z-Z, D Only	1.50	0.0	n/a	n/a	n/a	0.7755	0.7755	0.517
Z-Z, +D+Lr	1.50	0.0	n/a	n/a	n/a	1.298	1.298	0.865
Z-Z, +D+0.750Lr	1.50	0.0	n/a	n/a	n/a	1.168	1.168	0.779
Z-Z, +0.60D	1.50	0.0	n/a	n/a	n/a	0.4653	0.4653	0.310

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
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Footing Has NO Overturning

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
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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	0.8789	+Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.40D	0.8789	-Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.20D+0.50Lr	1.047	+Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.20D+0.50Lr	1.047	-Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.20D	0.7533	+Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.20D	0.7533	-Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.20D+1.60Lr	1.694	+Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +1.20D+1.60Lr	1.694	-Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +0.90D	0.5650	+Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
X-X, +0.90D	0.5650	-Z	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.40D	0.8789	-X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.40D	0.8789	+X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.20D+0.50Lr	1.047	-X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.20D+0.50Lr	1.047	+X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.20D	0.7533	-X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.20D	0.7533	+X	Bottom	0.3888	Min Temp %	0.40	17.624	OK

General Footing

Lic. # : KW-06006134

DB ENGINEERING

DESCRIPTION: RIDGE BEAM

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+1.60Lr	1.694	-X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +1.20D+1.60Lr	1.694	+X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +0.90D	0.5650	-X	Bottom	0.3888	Min Temp %	0.40	17.624	OK
Z-Z, +0.90D	0.5650	+X	Bottom	0.3888	Min Temp %	0.40	17.624	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	1.04 psi	1.04 psi	1.04 psi	1.04 psi	1.04 psi	75.00 psi	0.01	OK
+1.20D+0.50Lr	1.24 psi	1.24 psi	1.24 psi	1.24 psi	1.24 psi	75.00 psi	0.02	OK
+1.20D	0.89 psi	0.89 psi	0.89 psi	0.89 psi	0.89 psi	75.00 psi	0.01	OK
+1.20D+1.60Lr	2.01 psi	2.01 psi	2.01 psi	2.01 psi	2.01 psi	75.00 psi	0.03	OK
+0.90D	0.67 psi	0.67 psi	0.67 psi	0.67 psi	0.67 psi	75.00 psi	0.01	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	6.43 psi	150.00psi	0.04289	OK
+1.20D+0.50Lr	7.67 psi	150.00psi	0.05111	OK
+1.20D	5.52 psi	150.00psi	0.03677	OK
+1.20D+1.60Lr	12.40 psi	150.00psi	0.08268	OK
+0.90D	4.14 psi	150.00psi	0.02757	OK

All units k

General Footing

Lic. #: KW-06006134

DESCRIPTION: CEILING BEAM (2)

Code References

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

Load Combinations Used : ASCE 7-16

General Information

Material Properties

f_c : Concrete 28 day strength	=	2.50	ksi
f_y : Rebar Yield	=	40.0	ksi
E_c : Concrete Elastic Modulus	=	2,850.0	ksi
Concrete Density	=	145.0	pcf
ϕ Values Flexure	=	0.90	
Shear	=	0.750	

Soil Design Values

Allowable Soil Bearing	=	1.50	ksf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

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

Increases based on footing Depth

Footing base depth below soil surface	=	1.50	ft
Allow press. increase per foot of depth when footing base is below	=		ksf

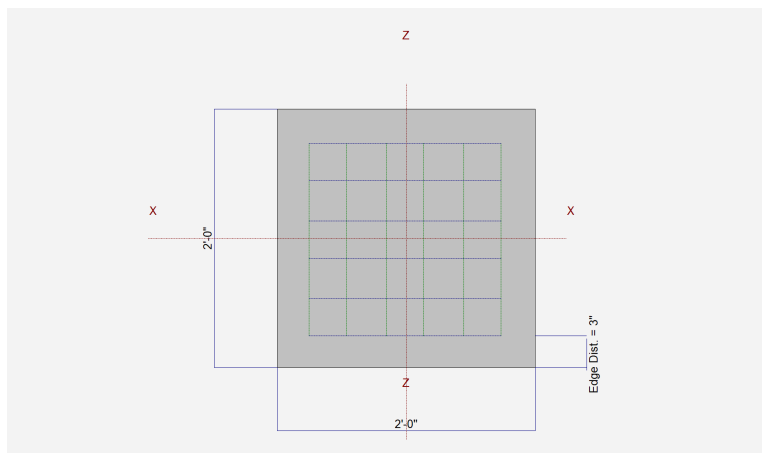
Increases based on footing plan dimension

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

Dimensions

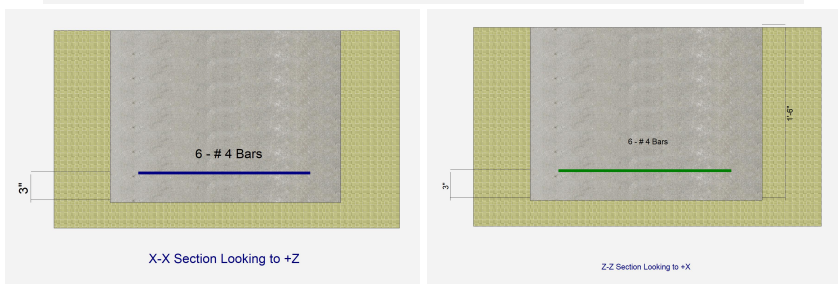
Width parallel to X-X Axis	=	2.0	ft
Length parallel to Z-Z Axis	=	2.0	ft
Footing Thickness	=	18.0	in

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



Reinforcing

Bars parallel to X-X Axis	=	
Number of Bars	=	6.0
Reinforcing Bar Size	=	# 4
Bars parallel to Z-Z Axis	=	
Number of Bars	=	6.0
Reinforcing Bar Size	=	# 4
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	=	1.837	2.386				k
OB : Overburden	=						ksf
M-xx	=						k-ft
M-zz	=						k-ft
V-x	=						k
V-z	=						k

General Footing

Lic. # : KW-06006134

DESCRIPTION: CEILING BEAM (2)

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.8487	Soil Bearing	1.273 ksf	1.50 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	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.02878	Z Flexure (+X)	0.7528 k-ft/ft	26.153 k-ft/ft	+1.20D+1.60Lr
PASS	0.02878	Z Flexure (-X)	0.7528 k-ft/ft	26.153 k-ft/ft	+1.20D+1.60Lr
PASS	0.02878	X Flexure (+Z)	0.7528 k-ft/ft	26.153 k-ft/ft	+1.20D+1.60Lr
PASS	0.02878	X Flexure (-Z)	0.7528 k-ft/ft	26.153 k-ft/ft	+1.20D+1.60Lr
PASS	n/a	1-way Shear (+X)	0.0 psi	75.0 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a
PASS	n/a	1-way Shear (+Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	1-way Shear (-Z)	0.0 psi	75.0 psi	n/a
PASS	n/a	2-way Punching	4.119 psi	75.0 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	1.50	n/a	0.0	0.6768	0.6768	n/a	n/a			0.451
X-X, +D+Lr	1.50	n/a	0.0	1.273	1.273	n/a	n/a			0.849
X-X, +D+0.750Lr	1.50	n/a	0.0	1.124	1.124	n/a	n/a			0.749
X-X, +0.60D	1.50	n/a	0.0	0.4061	0.4061	n/a	n/a			0.271
Z-Z, D Only	1.50	0.0	n/a	n/a	n/a	0.6768	0.6768			0.451
Z-Z, +D+Lr	1.50	0.0	n/a	n/a	n/a	1.273	1.273			0.849
Z-Z, +D+0.750Lr	1.50	0.0	n/a	n/a	n/a	1.124	1.124			0.749
Z-Z, +0.60D	1.50	0.0	n/a	n/a	n/a	0.4061	0.4061			0.271

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	0.3215	+Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.40D	0.3215	-Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.20D+0.50Lr	0.4247	+Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.20D+0.50Lr	0.4247	-Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.20D	0.2756	+Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.20D	0.2756	-Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.20D+1.60Lr	0.7528	+Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +1.20D+1.60Lr	0.7528	-Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +0.90D	0.2067	+Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
X-X, +0.90D	0.2067	-Z	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.40D	0.3215	-X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.40D	0.3215	+X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.20D+0.50Lr	0.4247	-X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.20D+0.50Lr	0.4247	+X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.20D	0.2756	-X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.20D	0.2756	+X	Bottom	0.3888	Min Temp %	0.60	26.153	OK

General Footing

Lic. # : KW-06006134

DB ENGINEERING

DESCRIPTION: CEILING BEAM (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
Z-Z, +1.20D+1.60Lr	0.7528	-X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +1.20D+1.60Lr	0.7528	+X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +0.90D	0.2067	-X	Bottom	0.3888	Min Temp %	0.60	26.153	OK
Z-Z, +0.90D	0.2067	+X	Bottom	0.3888	Min Temp %	0.60	26.153	OK

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+1.60Lr	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D	0.00 psi	0.00 psi	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D	1.76 psi	150.00psi	0.01173	OK
+1.20D+0.50Lr	2.32 psi	150.00psi	0.01549	OK
+1.20D	1.51 psi	150.00psi	0.01005	OK
+1.20D+1.60Lr	4.12 psi	150.00psi	0.02746	OK
+0.90D	1.13 psi	150.00psi	0.007539	OK

All units k

21256

1137 Vía Jose, San Jose, CA 95120, USA

Latitude, Longitude: 37.2249091, -121.8689361



Date	12/16/2021, 2:39:19 PM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	2.18	MCE_R ground motion. (for 0.2 second period)
S_1	0.782	MCE_R ground motion. (for 1.0s period)
S_{MS}	2.616	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.744	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	1.2	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.901	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	1.081	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
SsRT	2.23	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.363	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.18	Factored deterministic acceleration value. (0.2 second)
S1RT	0.84	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.914	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.782	Factored deterministic acceleration value. (1.0 second)
PGAd	0.901	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.944	Mapped value of the risk coefficient at short periods
C_{R1}	0.919	Mapped value of the risk coefficient at a period of 1 s

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ASCE Seismic Base Shear

Lic. #: KW-06006134

BUILDING

Risk Category	Calculations per ASCE 7-16
Risk Category of Building or Other Structure : "II" : All Buildings and other structures except those listed as Category I, III, and IV	ASCE 7-16, Page 4, Table 1.5-1
Seismic Importance Factor = 1	ASCE 7-16, Page 5, Table 1.5-2
USER DEFINED Ground Motion	ASCE 7-16 11.4.2

Max. Ground Motions, 5% Damping :

S_S	=	2.180 g, 0.2 sec response
S_1	=	0.7820 g, 1.0 sec response

Site Class, Site Coeff. and Design Category

Site Classification "D" : Shear Wave Velocity 600 to 1,200 ft/sec	=	D	ASCE 7-16 Table 20.3-1	
Site Coefficients F_a & F_v (using straight-line interpolation from table values)	F_a	=	1.20	ASCE 7-16 Table 11.4-1 & 11.4-2
	F_v	=	1.70	
Maximum Considered Earthquake Acceleration	$S_{MS} = F_a * S_s$	=	2.616	ASCE 7-16 Eq. 11.4-1
	$S_{M1} = F_v * S_1$	=	1.329	ASCE 7-16 Eq. 11.4-2
Design Spectral Acceleration	$S_{DS} = S_{MS}^{2/3}$	=	1.744	ASCE 7-16 Eq. 11.4-3
	$S_{D1} = S_{M1}^{2/3}$	=	0.886	ASCE 7-16 Eq. 11.4-4
Seismic Design Category	=	E $S_1 >= 0.75$	ASCE 7-16 Table 11.6-1 & -2	

Resisting System ASCE 7-16 Table 12.2-1

Basic Seismic Force Resisting System . . .	Bearing Wall Systems		
	15.Light-frame (wood) walls sheathed w/wood structural panels rated for shear resistance.		
Response Modification Coefficient "R"	= 6.50	Building height Limits :	
System Overstrength Factor "Wo"	= 3.00	Category "A & B" Limit:	No Limit
Deflection Amplification Factor "Cd"	= 4.00	Category "C" Limit:	No Limit
		Category "D" Limit:	Limit = 65
		Category "E" Limit:	Limit = 65
		Category "F" Limit:	Limit = 65

NOTE! See ASCE 7-16 for all applicable footnotes.

Lateral Force Procedure ASCE 7-16 Section 12.8.2

Equivalent Lateral Force Procedure

The "Equivalent Lateral Force Procedure" is being used according to the provisions of ASCE 7-16 12.8

Determine Building Period Use ASCE 12.8-7

Structure Type for Building Period Calculation :	All Other Structural Systems
"Ct" value = 0.020	"hn" : Height from base to highest level = 14.0 ft
"x" value = 0.75	
"Ta" Approximate fundamental period using Eq. 12.8-7 :	$T_a = C_t * (h_n \wedge x) = 0.145$ sec
"TL" : Long-period transition period per ASCE 7-16 Maps 22-14 -> 22-17	12.000 sec
Building Period "Ta" Calculated from Approximate Method selected	= 0.145 sec

"Cs" Response Coefficient ASCE 7-16 Section 12.8.1.1

S_{DS} : Short Period Design Spectral Response	=	1.744	From Eq. 12.8-2, Preliminary C_s	=	0.268
"R" : Response Modification Factor	=	6.50	From Eq. 12.8-3 & 12.8-4 , C_s need not exceed	=	0.942
"I" : Seismic Importance Factor	=	1	From Eq. 12.8-5 & 12.8-6, C_s not be less than	=	0.060
C_s : Seismic Response Coefficient	=			=	0.2683

Seismic Base Shear ASCE 7-16 Section 12.8.1

C_s = 0.2683 from 12.8.1.1	W (see Sum W_i below) =	0.00 k
	Seismic Base Shear $V = C_s * W$ =	0.00 k

ASCE Seismic Base Shear

Lic. # : KW-06006134

DB ENGINEERING

Vertical Distribution of Seismic Forces

ASCE 7-16 Section 12.8.3

"k" : hx exponent based on Ta = 1.00

Table of building Weights by Floor Level...

Level #	Wi : Weight	Hi : Height	(Wi * Hi^k)	Cvx	Fx=Cvx * V	Sum Story Shear	Sum Story Moment
Sum Wi =	0.00 k	Sum Wi * Hi =	0.00 k-ft		Total Base Shear =	0.00 k	
						Base Moment =	0.0 k-ft

Diaphragm Forces : Seismic Design Category "B" to "F"

ASCE 7-16 12.10.1.1

Level #	Wi	Fi	Sum Fi	Sum Wi	Fpx : Calcd	Fpx : Min	Fpx : Max	Fpx	Dsgn. Force
Wpx	Weight at level of diaphragm and other structure elements attached to it.								
Fi	Design Lateral Force applied at the level.								
Sum Fi	Sum of "Lat. Force" of current level plus all levels above								
MIN Req'd Force @ Level	0.20 * S _D	I * Wpx							
MAX Req'd Force @ Level	0.40 * S _D	I * Wpx							
Fpx : Design Force @ Level	Wpx * SUM(x->n) Fi / SUM(x->n) wi, x = Current level, n = Top Level								

ASCE 7-16 Wind Forces Chpt 28, Pt2 & Chpt 30, Pt2

Lic. #: KW-06006134

DESCRIPTION: BUILDING

General Design Values

Calculations per ASCE 7-16

V : Basic Wind Speed per Sect 26.5-1 or 2 **95.0** mph
 User specified minimum design pressure **16.0** psf
 Occupancy per Table 1.5-1 **II** All Buildings and other structures except those listed
 Exposure Category per 26.7 **Exposure B**
 Topographic Factor Kzt per 26.8 **1.00**

"Lambda" is interpolated between height tabular values.

Main Force Resisting System Values

Component & Cladding Values

MRH : Mean Roof Height **11.0** ft Effective Wind Area of Component & Cladding **10.0** ft²
 Roof Rise:Run Ratio **4:12** Roof pitch for cladding pressure **Flat/Hip/Gable Roof**
 LHD : Least Horizontal Dimension ft
 a = max (0.04 * LHD, 3, min(0.10 * LHD, 0.4*MRH)) **3.00** ft
 Lambda MWFRS: per Figure 26.8-1 **1.00** Lambda Component & Cladding : per Figure 30.4-1 **0.82**

Design Wind Pressures

Horizontal Pressures . . .

Zone: A = 19.80 psf Zone: C = 16.00 psf
 Zone: B = -16.00 psf Zone: D = -16.00 psf

Vertical Pressures . . .

Zone: E = -17.20 psf Zone: G = -16.00 psf
 Zone: F = -16.00 psf Zone: H = -16.00 psf

Overhangs . . .

Zone: Eoh = -24.10 psf Zone: Goh = -18.80 psf

ASCE 7-16 Section 28.5.4 Minimum Design Wind Loads requires that the load effects of the design wind pressures from Section 28.5.3 shall not be less than a minimum load defined by assuming the pressures, ps, for zones A and C equal to +16 psf, Zones B and D equal to +8 psf, while assuming ps for Zones E, F, G, and H are equal to 0 psf.

Component & Cladding Design Wind Pressures

Design Wind Pressure = Lambda * Kzt * Ps30 per Eq 30.4-1

Roof Pressures	Positive	Negative	Overhang Pressures	Negative
Zone 1	16.000	-21.238 psf	Zone 1	*** psf
Zone 1'	16.000	-16.000 psf	Zone 1'	*** psf
Zone 2	16.000	-27.962 psf	Zone 2	-23.534 psf
Zone 2e	***	*** psf	Zone 2e	*** psf
Zone 2n	***	*** psf	Zone 2n	*** psf
Zone 2r	***	*** psf	Zone 2r	*** psf
Zone 3	16.000	-38.130 psf	Zone 3	-31.898 psf
Zone 3e	***	*** psf	Zone 3e	*** psf
Zone 3r	***	*** psf	Zone 3r	*** psf
Wall Pressures				
Wall Zone 4 :	***	*** psf	**** : There is no value in Figure 30.4-1 Tabular Values	
Wall Zone 5 :	***	*** psf		

$$\text{WIND LOAD ; } P = 19.8 \text{ psf} \div 1.6 = 12.4 \text{ psf}$$

$$\text{NS } \begin{cases} w_{12} = 12.4 \text{ psf} \times \left(\frac{8 \text{ ft}}{2} + 3.5 \text{ ft} \right) = 93 \text{ plf} \\ w_{24} = 12.4 \text{ psf} \times \left(\frac{8 \text{ ft}}{2} + 5.25 \text{ ft} \right) = 115 \text{ plf} \\ w_{45} = 12.4 \text{ psf} \times \left(\frac{8 \text{ ft}}{2} + 4.25 \text{ ft} \right) = 102 \text{ plf} \end{cases}$$

$$\text{EW } \begin{cases} w_{CD} = 12.4 \text{ psf} \times \left(\frac{8 \text{ ft}}{2} + 5.25 \text{ ft} \right) = 115 \text{ plf} \\ w_{BC} = w_{DF} = 12.4 \text{ psf} \times \left(\frac{8 \text{ ft}}{2} + 4.25 \text{ ft} \right) = 102 \text{ plf} \\ w_{AC} = w_{DE} = 12.4 \text{ psf} \times \left(\frac{8 \text{ ft}}{2} + 3.5 \text{ ft} \right) = 93 \text{ plf} \end{cases}$$

SHEAR WALL DESIGN

Line 3

$$F_3 = w_{24} \times \frac{32.75 \text{ ft}}{2} = \begin{cases} 105 \text{ plf} \times 16.375 \text{ ft} = 1719 \text{ lbs (seismic)} \\ 115 \text{ plf} \times 16.375 \text{ ft} = 1883 \text{ lbs (wind)} * \end{cases}$$

$$L_3 = 13.5 \text{ ft}$$

$$v_3 = \frac{1883 \text{ lbs}}{13.5 \text{ ft}} = 140 \text{ plf} \rightarrow \triangle$$

$$T_3 = \frac{1883 \text{ lbs} \times 8 \text{ ft}}{13.5 \text{ ft} - 0.5 \text{ ft}} = 1159 \text{ lbs} \rightarrow \text{HDU2}$$

Line 5

$$F_5 = w_{45} \times \frac{21 \text{ ft}}{2} = \begin{cases} 199 \text{ plf} \times 10.5 \text{ ft} = 2090 \text{ lbs (seismic)} * \\ 102 \text{ plf} \times 10.5 \text{ ft} = 1071 \text{ lbs (wind)} \end{cases}$$

$$L_5 = 22.5 \text{ ft}$$

$$v_5 = \frac{2090 \text{ lbs}}{22.5 \text{ ft}} = 93 \text{ plf} \rightarrow \triangle$$

$$T_5 = \frac{2090 \text{ lbs} \times 8 \text{ ft}}{22.5 \text{ ft} - 0.5 \text{ ft}} = 760 \text{ lbs} \rightarrow \text{HDU2}$$

Line C

$$F_c = w_{CD} \times \frac{27 \text{ ft}}{2} + w_{AC} \times \frac{25.5 \text{ ft}}{2} + w_{BC} \times \frac{10 \text{ ft}}{2}$$

$$= \begin{cases} 236 \text{ plf} \times 13.5 \text{ ft} + 79 \text{ plf} \times 12.75 \text{ ft} + 89 \text{ plf} \times 5 \text{ ft} = 4638 \text{ lbs} \\ \text{(seismic)}^* \\ 115 \text{ plf} \times 13.5 \text{ ft} + 93 \text{ plf} \times 12.75 \text{ ft} + 102 \text{ plf} \times 5 \text{ ft} = 3248 \text{ lbs} \\ \text{(wind)} \end{cases}$$

$L_c = \text{STRONG-WALLS}$

Line D

$$F_D = w_{CD} \times \frac{27 \text{ ft}}{2} + w_{DE} \times \frac{17.75 \text{ ft}}{2} + w_{DF} \times \frac{23 \text{ ft}}{2}$$

$$= \begin{cases} 115 \text{ plf} \times 13.5 \text{ ft} + 93 \text{ plf} \times 8.875 \text{ ft} + 102 \text{ plf} \times 11.5 \text{ ft} = 3351 \text{ lbs} \\ \text{(wind)} \\ 236 \text{ plf} \times 13.5 \text{ ft} + 79 \text{ plf} \times 8.875 \text{ ft} + 89 \text{ plf} \times 11.5 \text{ ft} = 4911 \text{ lbs} \\ \text{(seismic)}^* \end{cases}$$

$$L_D = 5.75 \text{ ft} + 10.75 \text{ ft} = 22.5 \text{ ft}$$

$$v_D = \frac{4911 \text{ lbs}}{22.5 \text{ ft}} = 218 \text{ plf} \rightarrow \triangle 6$$

$$T_D = \frac{(218 \text{ plf} \times 5.75 \text{ ft}) \times 8 \text{ ft}}{5.75 \text{ ft} - 0.5 \text{ ft}} = 1910 \text{ lbs} \rightarrow \text{HDU2}$$

Job Name: 21256
 Wall Name: Line C
 Application: 1st Story Wood Floor Systems

Design Criteria:

- * 2018 International Bldg Code
- * Seismic R=6.5
- * 2500 psi concrete
- * ASD Design Shear = 4638 lbs
- * Floor Joist Depth = 10"
- * Nominal wall height = 8 ft

Selected Strong-Wall® Panel Solution:

Model	Type	W (in)	H (in)	T (in)	Sill Anchor	End Anchor Bolts	Total Axial Load (lbs)	Actual Uplift (lbs)
WSWH18x8	Wood	18	93.25	3.5	N/A	2 - 1"	0	10297 lb
WSWH18x8	Wood	18	93.25	3.5	N/A	2 - 1"	0	10297 lb
WSWH18x8	Wood	18	93.25	3.5	N/A	2 - 1"	0	10297 lb

Actual Shear & Drift Distribution:

Model	RR Relative Rigidity	Actual Shear (lbs)	Allowable Shear (lbs)	Actual / Allow Shear	Actual Drift (in)	Drift Limit (in)
WSWH18x8	0.33	1546	1680 OK	0.92	0.39	0.42
WSWH18x8	0.33	1546	1680 OK	0.92	0.39	0.42
WSWH18x8	0.33	1546	1680 OK	0.92	0.39	0.42

Notes:

1. Strong-Wall High-Strength Wood Shearwalls have been evaluated to the 2018 IBC/IRC. See www.strongtie.com for additional design and installation information.
2. Anchor templates are recommended for proper anchor bolt placement, and are required in some jurisdictions.
3. The applied vertical load shall be a concentric point load or a uniformly distributed load not exceeding the allowable vertical load. Alternatively, the load may be applied anywhere along the width of the panel if imposed by a continuous bearing vertical load transfer element such as a rimboard or beam. For eccentric axial loads applied directly to the panel, the allowable vertical load shall be divided by two.
4. Panels may be trimmed to a minimum height of 74½".
5. Raised Floor Application requires WSWH-RF__KT Connection Kit based on panel width (example: WSWH-RF18KT).

Disclaimer:

It is the Designer's responsibility to verify product suitability under applicable building codes. In order to verify code listed applications please refer to the appropriate product code reports at www.strongtie.com or contact Simpson Strong-Tie Company Inc. at 1-800-999-5099.

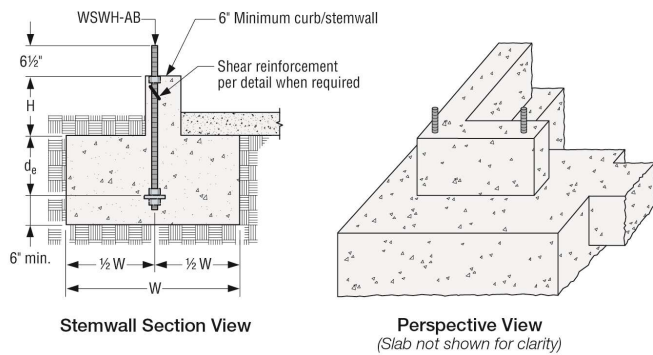
Job Name: 21256
 Wall Name: Line C
 Application: 1st Story Wood Floor Systems

Design Criteria:

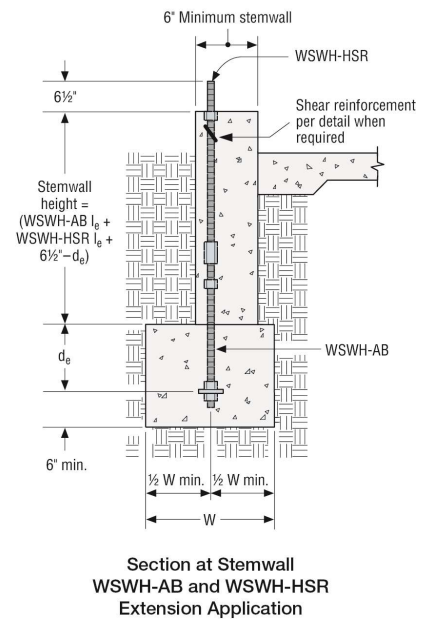
- * Stemwall - Perimeter
- * 2018 International Bldg Code
- * Seismic R=6.5
- * 2500 psi concrete

Anchor Solution Details:

Stemwall Installation



Stemwall Extension Installation



Anchor Solution Assuming Cracked Concrete Design:

Model	W	de	B	Anchor Bolt	Strength
WSWH18x8	48	16	14	WSWH-AB	High Strength

Anchor Solution Assuming Uncracked Concrete Design:

Model	W	de	B	Anchor Bolt	Strength
WSWH18x8	42	14	14	WSWH-AB	High Strength

Notes:

1. Anchorage designs conform to ACI 318-14 and 318-11 Appendix D with no supplementary reinforcement for cracked and uncracked concrete as noted.
2. Anchorage strength indicates required grade of anchor bolt. Standard (ASTM F1554 grade 36) or High Strength (HS)(ASTM A193 Grade B7).
3. Seismic indicates Seismic Design Category C through F. Detached 1 & 2 family dwellings in SDC C may use wind anchorage solutions. Seismic anchorage designs conform to ACI 318-11 section D.3.3.4.3 and ACI 318-14 section 17.2.3.4.3
4. Foundation dimensions are for anchorage only. Foundation design (size and reinforcement) by others. The registered design professional may specify alternate embedment, footing size or anchor bolt.