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Date: 7/7/21
Engineer: Jeff Morgan, S.E.
Job #: 21.070

STRUCTURAL CALCULATIONS FOR THE MANTIGI ADU

901 CLYDE AVENUE
SANTA CLARA, CA 95054



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	project: Mantigi	by:	sheet no:
	location: Santa Clara, CA	JM	
		date:	job no:
		07/07/21	21.070
REFERENCE 2019 California Building Code			

Typical Roof Loads:

Comp Shingles	6.0 psf	
1/2" Sheathing	1.5 psf	
Framing	4.0 psf	
Insulation	1.0 psf	
5/8" Gyp Board Ceiling	2.8 psf	
Misc	1.7 psf	
	<hr/>	
	17.0 psf	DL: 17.0 psf
		RLL: 20.0 psf

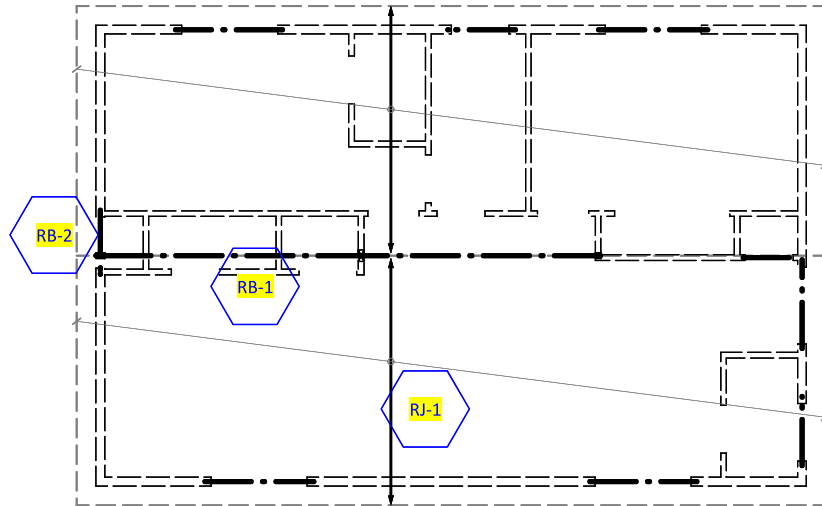


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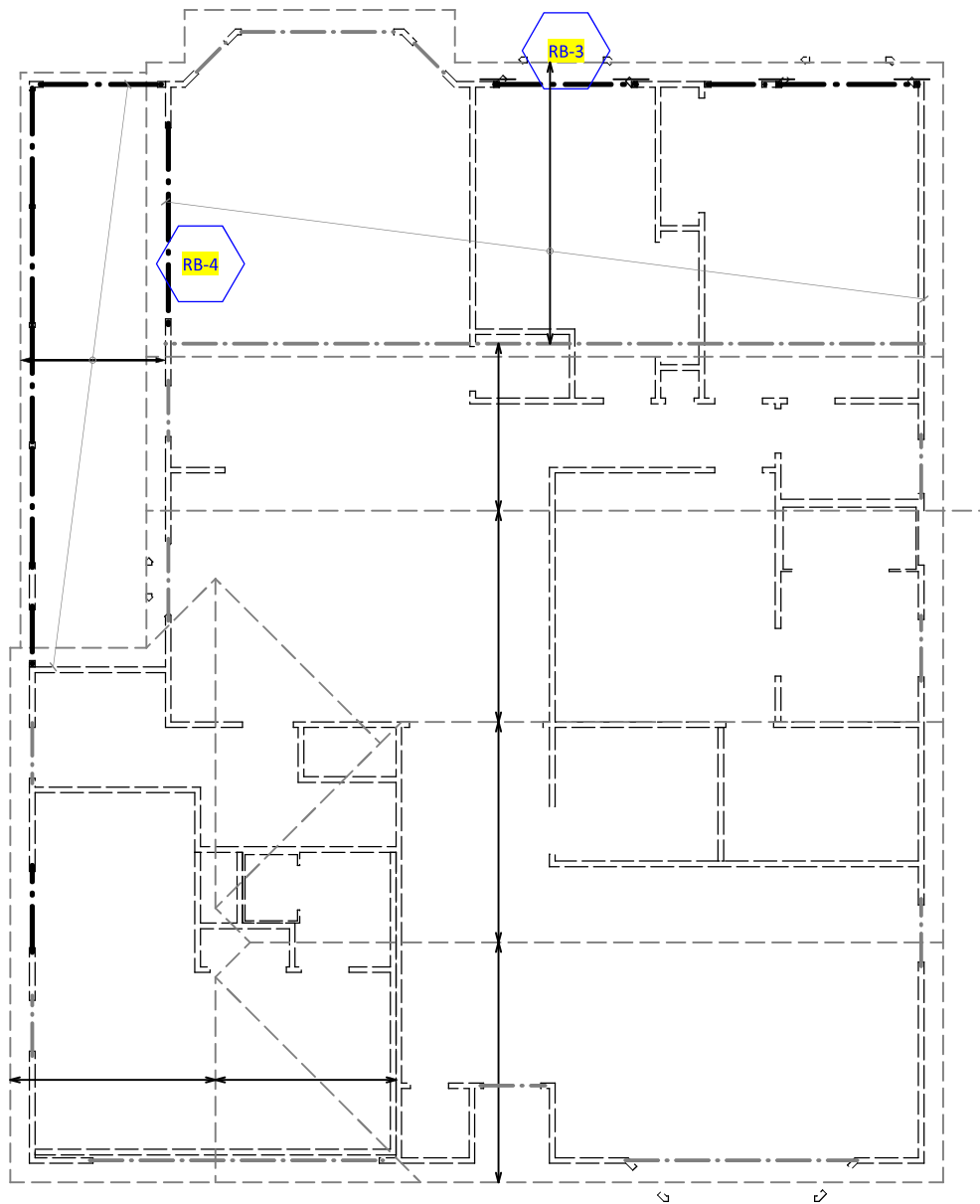
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Wood Beam

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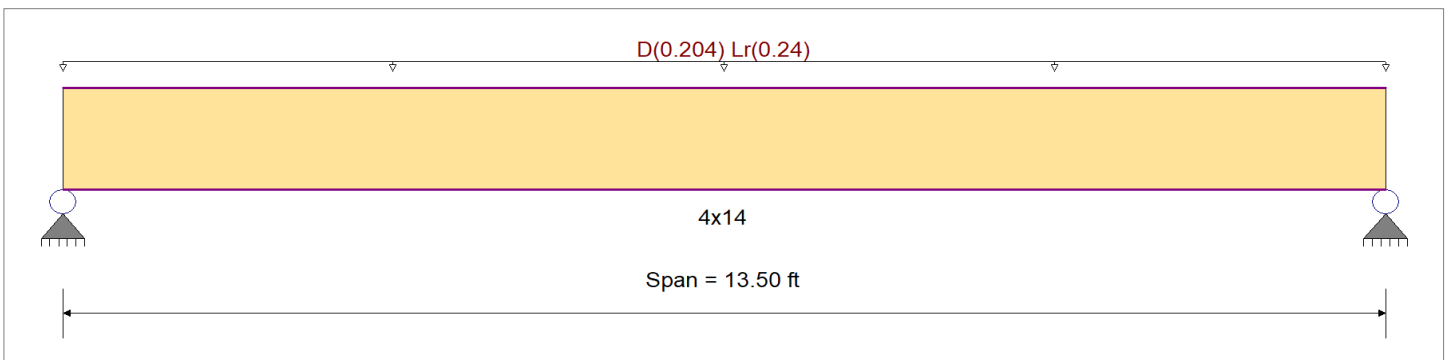
DESCRIPTION: RB-1

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 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	31.21 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Uniform Load : D = 0.0170, Lr = 0.020 ksf, Tributary Width = 12.0 ft, (ROOF)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.948 1	Maximum Shear Stress Ratio =	0.362 : 1
Section used for this span	4x14	Section used for this span	4x14
fb: Actual =	1,185.20psi	fv: Actual =	81.37 psi
Fb: Allowable =	1,250.00psi	Fv: Allowable =	225.00 psi
Load Combination =	+D+Lr	Load Combination =	+D+Lr
Location of maximum on span =	6.750ft	Location of maximum on span =	0.000 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.156 in	Ratio =	1035 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.289 in	Ratio =	559 >=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	Fv	
D Only																		
Length = 13.451 ft	1		0.605	0.231	0.90	1.000	1.00	1.00	1.00	1.00	1.00	4.65	544.55	900.00	0.00	0.00	0.00	0.00
Length = 0.04927 ft	1		0.009	0.231	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.07	7.92	900.00	0.00	0.00	0.00	0.00
+D+Lr						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 13.451 ft	1		0.948	0.362	1.25	1.000	1.00	1.00	1.00	1.00	1.00	10.11	1,185.20	1250.00	2.52	81.37	225.00	225.00
Length = 0.04927 ft	1		0.014	0.362	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.15	17.24	1250.00	2.52	81.37	225.00	225.00
+D+0.750Lr						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 13.451 ft	1		0.820	0.313	1.25	1.000	1.00	1.00	1.00	1.00	1.00	8.75	1,025.04	1250.00	2.18	70.38	225.00	225.00
Length = 0.04927 ft	1		0.012	0.313	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.13	14.91	1250.00	2.18	70.38	225.00	225.00
+0.60D						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00
Length = 13.451 ft	1		0.204	0.078	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.79	326.73	1600.00	0.69	22.43	288.00	288.00
Length = 0.04927 ft	1		0.003	0.078	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.04	4.75	1600.00	0.69	22.43	288.00	288.00

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DESCRIPTION: RB-1

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.2894	6.799		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	2.997	2.997
Overall MINimum	1.620	1.620
D Only	1.377	1.377
+D+Lr	2.997	2.997
+D+0.750Lr	2.592	2.592
+0.60D	0.826	0.826
Lr Only	1.620	1.620

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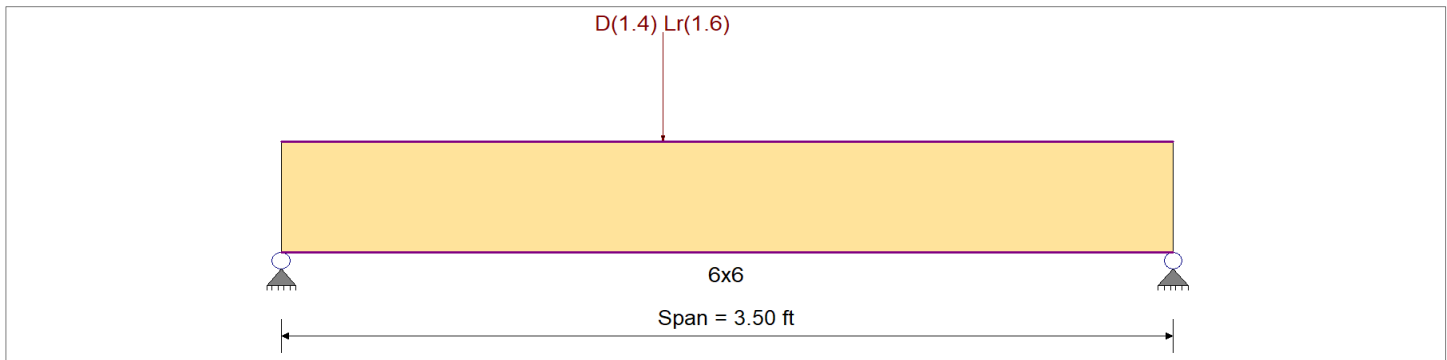
DESCRIPTION: RB-2

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1600 psi	E : Modulus of Elasticity	
Load Combination ASCE 7-16	Fb -	1600 psi	Ebend- xx	1600ksi
	Fc - Prll	1100 psi	Eminbend - xx	580ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : Select Structural	Fv	170 psi		
	Ft	950 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.

Point Load : D = 1.40, Lr = 1.60 k @ 1.50 ft, (RB-1)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.554 1	Maximum Shear Stress Ratio =	0.400 : 1
Section used for this span	6x6	Section used for this span	6x6
fb: Actual =	1,108.74 psi	fv: Actual =	85.01 psi
Fb: Allowable =	2,000.00 psi	Fv: Allowable =	212.50 psi
Load Combination =	+D+Lr	Load Combination =	+D+Lr
Location of maximum on span =	1.495ft	Location of maximum on span =	0.000 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.020 in	Ratio =	2119 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.037 in	Ratio =	1130 >=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 Only	Length = 3.50 ft	1	0.359	0.259	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.20	517.41	1440.00	0.00	0.00	0.00	0.00
+D+Lr	Length = 3.50 ft	1	0.554	0.400	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.56	1,108.74	2000.00	0.00	0.00	0.00	0.00
+D+0.750Lr	Length = 3.50 ft	1	0.480	0.347	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.22	960.91	2000.00	0.00	0.00	0.00	0.00
+0.60D	Length = 3.50 ft	1	0.121	0.088	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.72	310.45	2560.00	0.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.0372	1.686		0.0000	0.000

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DESCRIPTION: RB-2

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.714	1.286
Overall MINimum	0.914	0.686
D Only	0.800	0.600
+D+Lr	1.714	1.286
+D+0.750Lr	1.486	1.114
+0.60D	0.480	0.360
Lr Only	0.914	0.686

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 Project ID:
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Wood Beam

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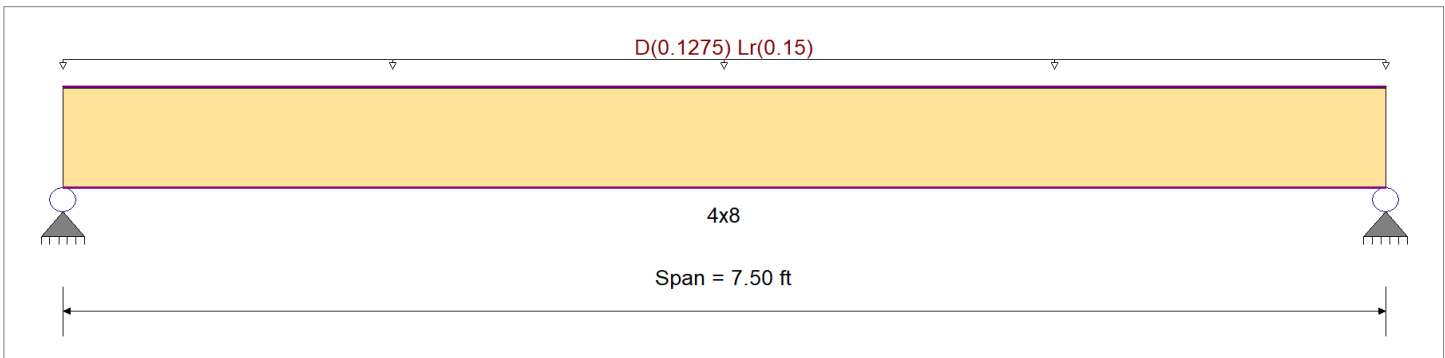
DESCRIPTION: RB-3

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 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	1700 ksi
	Fc - Prll	1500 psi	Eminbend - xx	620 ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : No.1	Fv	180 psi		
	Ft	675 psi	Density	31.21 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Uniform Load : D = 0.0170, Lr = 0.020 ksf, Tributary Width = 7.50 ft, (ROOF)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.470	1	Maximum Shear Stress Ratio	=	0.229	: 1
Section used for this span		4x8		Section used for this span		4x8	
fb: Actual	=	763.63 psi		fv: Actual	=	51.64 psi	
Fb: Allowable	=	1,625.00 psi		Fv: Allowable	=	225.00 psi	
Load Combination		+D+Lr		Load Combination		+D+Lr	
Location of maximum on span	=	3.750 ft		Location of maximum on span	=	6.898 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.057 in	Ratio =	1583	>=	360	
Max Upward Transient Deflection		0.000 in	Ratio =	0	<	360	
Max Downward Total Deflection		0.105 in	Ratio =	855	>=	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 Only	Length = 7.50 ft	1	0.300	0.146	0.90	1.300	1.00	1.00	1.00	1.00	1.00	0.90	350.86	1170.00	0.00	0.00	0.00	0.00
+D+Lr	Length = 7.50 ft	1	0.470	0.229	1.25	1.300	1.00	1.00	1.00	1.00	1.00	1.95	763.63	1625.00	0.00	0.00	0.00	0.00
+D+0.750Lr	Length = 7.50 ft	1	0.406	0.198	1.25	1.300	1.00	1.00	1.00	1.00	1.00	1.69	660.44	1625.00	0.00	0.00	0.00	0.00
+0.60D	Length = 7.50 ft	1	0.101	0.049	1.60	1.300	1.00	1.00	1.00	1.00	1.00	0.54	210.51	2080.00	0.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.1052	3.777		0.0000	0.000

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DESCRIPTION: RB-3

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.041	1.041
Overall MINimum	0.563	0.563
D Only	0.478	0.478
+D+Lr	1.041	1.041
+D+0.750Lr	0.900	0.900
+0.60D	0.287	0.287
Lr Only	0.563	0.563

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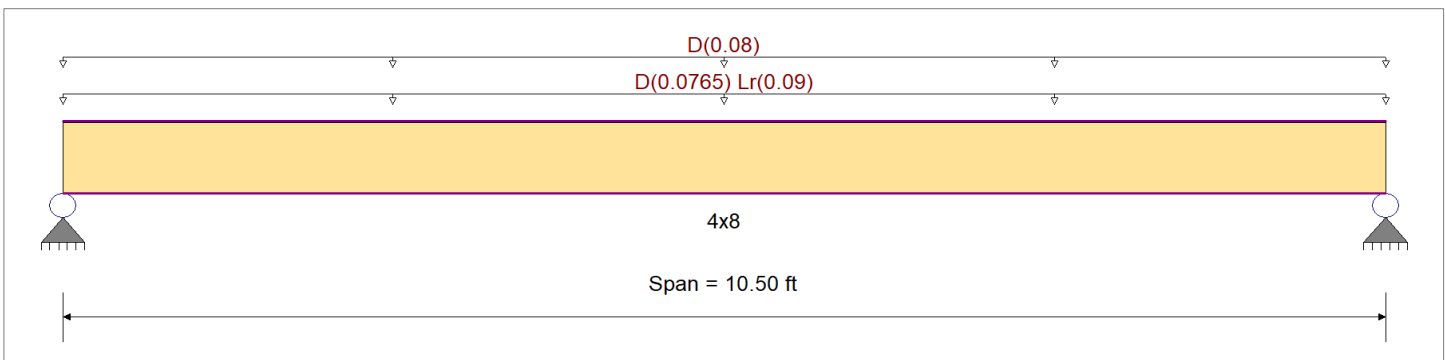
DESCRIPTION: RB-4

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir-Larch	Fc - Perp	625.0 psi	
Wood Grade : No. 1	Fv	180.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

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

Uniform Load : D = 0.0170, Lr = 0.020 ksf, Tributary Width = 4.50 ft, (ROOF)
 Uniform Load : D = 0.020 ksf, Tributary Width = 4.0 ft, (WALL)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.818 < 1	Maximum Shear Stress Ratio =	0.303 < 1
Section used for this span	4x8	Section used for this span	4x8
fb: Actual =	1,329.52 psi	fv: Actual =	68.12 psi
Fb: Allowable =	1,625.00 psi	Fv: Allowable =	225.00 psi
Load Combination	+D+Lr	Load Combination	+D+Lr
Location of maximum on span	5.250 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.131 in	Ratio =	961 >= 360
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360
Max Downward Total Deflection	0.359 in	Ratio =	351 >= 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 Only	Length = 10.50 ft	1	0.721	0.267	0.90	1.300	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.16	844.10	1170.00	0.00	0.00	0.00	0.73	43.25	162.00
+D+Lr	Length = 10.50 ft	1	0.818	0.303	1.25	1.300	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.40	1,329.52	1625.00	0.00	0.00	0.00	1.15	68.12	225.00
+D+0.750Lr	Length = 10.50 ft	1	0.743	0.275	1.25	1.300	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.09	1,208.16	1625.00	0.00	0.00	0.00	1.05	61.91	225.00
+0.60D	Length = 10.50 ft	1	0.243	0.090	1.60	1.300	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.29	506.46	2080.00	0.00	0.00	0.00	0.44	25.95	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.3589	5.288		0.0000	0.000

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Wood Beam

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DESCRIPTION: RB-4

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.294	1.294
Overall MINimum	0.473	0.473
D Only	0.822	0.822
+D+Lr	1.294	1.294
+D+0.750Lr	1.176	1.176
+0.60D	0.493	0.493
Lr Only	0.473	0.473

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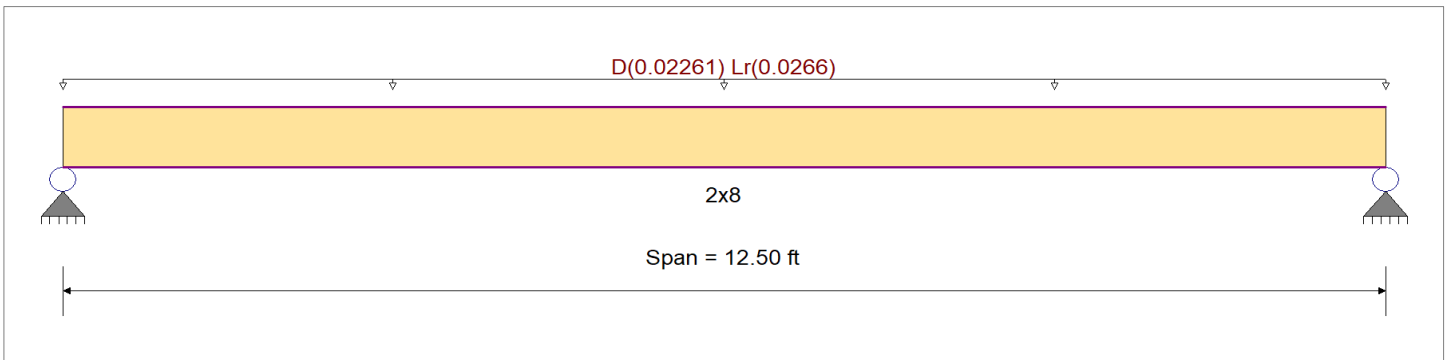
DESCRIPTION: RJ-1

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 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	1700 ksi
	Fc - Prll	1500 psi	Eminbend - xx	620 ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : No. 1	Fv	180 psi		
	Ft	675 psi	Density	31.21 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			Repetitive Member Stress Increase	



Applied Loads

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

Uniform Load : D = 0.0170, Lr = 0.020 ksf, Tributary Width = 1.330 ft, (ROOF)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.509	1	Maximum Shear Stress Ratio	=	0.171	: 1
Section used for this span		2x8		Section used for this span		2x8	
fb: Actual	=	877.71 psi		fv: Actual	=	38.40 psi	
Fb: Allowable	=	1,725.00 psi		Fv: Allowable	=	225.00 psi	
Load Combination		+D+Lr		Load Combination		+D+Lr	
Location of maximum on span	=	6.250 ft		Location of maximum on span	=	11.907 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.181 in	Ratio =	826	>=	360	
Max Upward Transient Deflection		0.000 in	Ratio =	0	<	360	
Max Downward Total Deflection		0.336 in	Ratio =	446	>=	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 Only																			
Length = 12.50 ft	1	0.325	0.109	0.90	1.200	1.00	1.15	1.00	1.00	1.00	0.44	403.27	1242.00	0.00	0.00	0.00	0.00	0.00	162.00
+D+Lr																			
Length = 12.50 ft	1	0.509	0.171	1.25	1.200	1.00	1.15	1.00	1.00	1.00	0.96	877.71	1725.00	0.00	0.00	0.00	0.00	0.00	225.00
+D+0.750Lr																			
Length = 12.50 ft	1	0.440	0.148	1.25	1.200	1.00	1.15	1.00	1.00	1.00	0.83	759.10	1725.00	0.00	0.00	0.00	0.00	0.00	225.00
+0.60D																			
Length = 12.50 ft	1	0.110	0.037	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.26	241.96	2208.00	0.00	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	1	0.3358	6.296		0.0000	0.000

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Title Block Line 6

Project Title:
Engineer:
Project ID:
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DESCRIPTION: RJ-1

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.308	0.308
Overall MINimum	0.166	0.166
D Only	0.141	0.141
+D+Lr	0.308	0.308
+D+0.750Lr	0.266	0.266
+0.60D	0.085	0.085
Lr Only	0.166	0.166

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 Title Block Line 6

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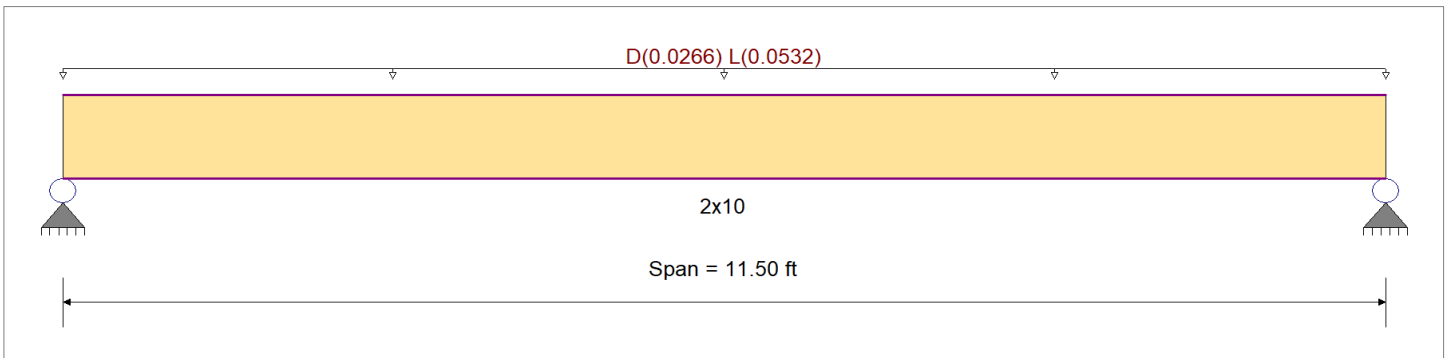
DESCRIPTION: FJ-1

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 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	1700 ksi
	Fc - Prll	1500 psi	Eminbend - xx	620 ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : No. 1	Fv	180 psi		
	Ft	675 psi	Density	31.21 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			Repetitive Member Stress Increase	



Applied Loads

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

Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 1.330 ft, (FLOOR)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.585 : 1	Maximum Shear Stress Ratio =	0.239 : 1
Section used for this span	2x10	Section used for this span	2x10
fb: Actual =	740.06 psi	fv: Actual =	43.09 psi
Fb: Allowable =	1,265.00 psi	Fv: Allowable =	180.00 psi
Load Combination =	+D+L	Load Combination =	+D+L
Location of maximum on span =	5.750ft	Location of maximum on span =	0.000 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.125 in	Ratio =	1102 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.188 in	Ratio =	734 >=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	Fv	
D Only	Length = 11.50 ft	1	0.217	0.089	0.90	1.100	1.00	1.15	1.00	1.00	1.00	0.44	246.69	1138.50	0.00	0.00	0.00	0.00
+D+L	Length = 11.50 ft	1	0.585	0.239	1.00	1.100	1.00	1.15	1.00	1.00	1.00	1.32	740.06	1265.00	0.00	0.00	0.00	0.00
+D+0.750L	Length = 11.50 ft	1	0.390	0.160	1.25	1.100	1.00	1.15	1.00	1.00	1.00	1.10	616.72	1581.25	0.00	0.00	0.00	0.00
+0.60D	Length = 11.50 ft	1	0.073	0.030	1.60	1.100	1.00	1.15	1.00	1.00	1.00	0.26	148.01	2024.00	0.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1878	5.792		0.0000	0.000

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Title Block Line 6

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Engineer:
Project ID:
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DESCRIPTION: FJ-1

Load Combination	Support notation : Far left is #1		Values in KIPS
	Support 1	Support 2	
Overall MAXimum	0.459	0.459	
Overall MINimum	0.306	0.306	
D Only	0.153	0.153	
+D+L	0.459	0.459	
+D+0.750L	0.382	0.382	
+0.60D	0.092	0.092	
L Only	0.306	0.306	

Title Block Line 1
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 Title Block Line 6

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 Engineer:
 Project ID:
 Project Descr:

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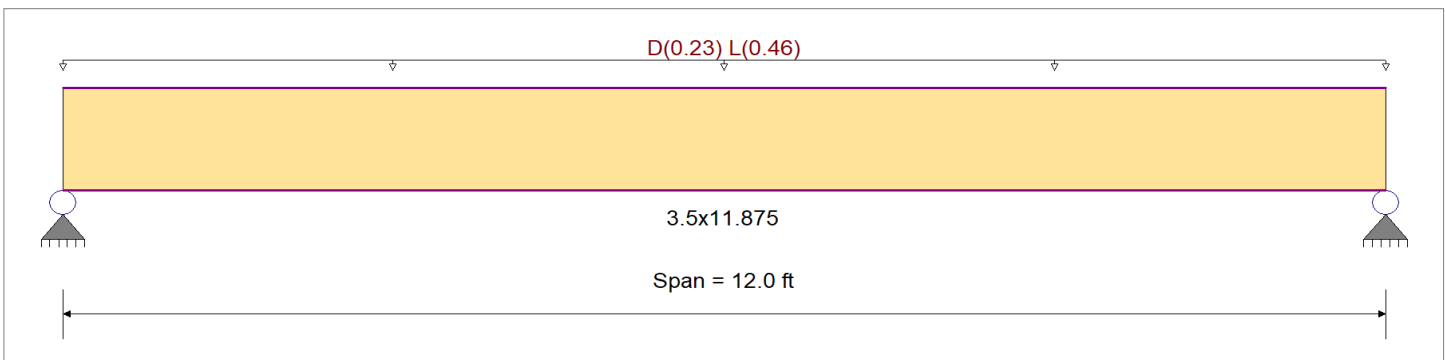
DESCRIPTION: FB-1

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	3100 psi	E : Modulus of Elasticity	
Load Combination ASCE 7-16	Fb -	3100 psi	Ebend- xx	2000 ksi
	Fc - Prll	3000 psi	Eminbend - xx	30120482 ksi
Wood Species : Boise Cascade	Fc - Perp	750 psi		
Wood Grade : Versa Lam 3100	Fv	285 psi		
	Ft	2100 psi	Density	41.76pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Uniform Load : D = 0.020, L = 0.040 ksf, Tributary Width = 11.50 ft, (FLOOR)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.584 : 1	Maximum Shear Stress Ratio =	0.440 : 1
Section used for this span	3.5x11.875	Section used for this span	3.5x11.875
fb: Actual =	1,810.31 psi	fv: Actual =	125.37 psi
Fb: Allowable =	3,100.00 psi	Fv: Allowable =	285.00 psi
Load Combination =	+D+L	Load Combination =	+D+L
Location of maximum on span =	6.000ft	Location of maximum on span =	0.000 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.221 in	Ratio =	652 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.331 in	Ratio =	434 >=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 Only	Length = 12.0 ft	1	0.216	0.163	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	4.14	603.44	2790.00	0.00	0.00	0.00	0.00
+D+L	Length = 12.0 ft	1	0.584	0.440	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.00	12.42	1,810.31	3100.00	0.00	0.00	0.00	0.00
+D+0.750L	Length = 12.0 ft	1	0.389	0.293	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	10.35	1,508.59	3875.00	0.00	0.00	0.00	0.00
+0.60D	Length = 12.0 ft	1	0.073	0.055	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.48	362.06	4960.00	0.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.3311	6.044		0.0000	0.000

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Wood Beam

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DESCRIPTION: FB-1

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.140	4.140
Overall MINimum	2.760	2.760
D Only	1.380	1.380
+D+L	4.140	4.140
+D+0.750L	3.450	3.450
+0.60D	0.828	0.828
L Only	2.760	2.760



Job: Mantigi

ASD Lateral Force Analysis 2019 CBC

SEISMIC DESIGN BASE SHEAR (STATIC)

Risk Category: II (IBC Table 1604.5)

$I_e = 1.00$ (ASCE Table 11.5-1)

$R = 6.5$ (ASCE Table 12.2-1)

$C_d = 4$ (ASCE Table 12.2-1)

$\Omega_o = 2.5$

Reduced by 1/2 for flexible diaphragms per ASCE Table 12.2-1 footnote g

SEISMIC GROUND MOTION VALUES

Site Classification = D

Short Period

$S_s = 1.500$

$F_a = 1.200$ (IBC Table 1613.5.3(1))

$S_{MS} = 1.800$ (IBC Eq. 16-37)

$S_{DS} = 1.200$ (IBC Eq. 16-39)

Long Period

$S_1 = 0.600$

$F_v = 1.500$ (IBC Table 1613.5.3(2))

$S_{M1} = 0.900$ (IBC Eq. 16-38)

$S_{D1} = 0.600$ (IBC Eq. 16-40)

APPROXIMATE FUNDAMENTAL PERIOD

Building Type: All Other Structural Systems

Maximum Height = 14.0 ft

$T_a = 0.14$ sec (ASCE Eq. 12.8-7)

$T_0 = 0.10$ sec

$T_s = 0.50$ sec

$T_L = 8$ sec (ASCE Figure 22-16)

SEISMIC DESIGN CATEGORY

SDC = D

(ASCE 11.6)

SEISMIC BASE SHEAR

$C_s = 0.1846$ Govs (ASCE Eq. 12.8-2)

$C_{S\ MAX} = 0.6377$ (ASCE Eq. 12.8-3 & Eq. 12.8-4)

$C_{S\ MIN} = 0.0462$ (ASCE Eq. 12.8-5 & Eq. 12.8-6)

$C_s = 0.1846$

$V = 0.1846 * W$



901 Clyde Ave, Santa Clara, CA 95054, USA

Latitude, Longitude: 37.39085420000001, -121.9503995



Date	7/6/2021, 11:22:48 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S_S	1.5	MCE_R ground motion. (for 0.2 second period)
S_1	0.6	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.8	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	1.2	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	0.581	MCE_G peak ground acceleration
F_{PGA}	1.2	Site amplification factor at PGA
PGA_M	0.697	Site modified peak ground acceleration
T_L	12	Long-period transition period in seconds
S_{sRT}	2.167	Probabilistic risk-targeted ground motion. (0.2 second)
S_{sUH}	2.287	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S_{sD}	1.5	Factored deterministic acceleration value. (0.2 second)
S_{1RT}	0.803	Probabilistic risk-targeted ground motion. (1.0 second)
S_{1UH}	0.866	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S_{1D}	0.6	Factored deterministic acceleration value. (1.0 second)
$PGAd$	0.581	Factored deterministic acceleration value. (Peak Ground Acceleration)
C_{RS}	0.947	Mapped value of the risk coefficient at short periods
C_{R1}	0.928	Mapped value of the risk coefficient at a period of 1 s



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ASD Lateral Force Analysis 2019 CBC

$C_s : 0.185$ $k = 1.00$ (ASCE Eq. 12.8-12)
--

VERTICAL SEISMIC FORCE DISTRIBUTION (ASCE 12.8.3)										
Level	Height (ft)	DL (psf)	Add'l Mass (kips)	Floor Area (sq.ft.)	Weight (kips)	wh^k (k-ft)	C_v (12.8-12)	Story Shear (kips)	% Total	
L5	11.0	27.0	0.0	1020	28	303	1.000	5	5.0	100.0%
Totals:					28	303	1.0	5		

Base Shear

DIAPHRAGM LOADS (ASCE 12.10)											
Level	DL (psf)	NORTH-SOUTH DIRECTION					EAST-WEST DIRECTION				
		PL (psf)	(12.10-1) (psf)	Max (psf)	Min (psf)	Gov (psf)	PL (psf)	(12.10-1) (psf)	Max (psf)	Min (psf)	Gov (psf)
L5	27	0.0	5.0	13.0	6.5	6.5	0.0	5.0	13.0	6.5	6.5



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ASD Lateral Force Analysis 2019 CBC

IBC 1609.6 ALTERNATIVE ALL-HEIGHTS METHOD

DESIGN WIND PRESSURE - MAIN WIND FORCE RESISTING SYSTEM

Exposure Category = C	(IBC 1609.4.2)	N-S Dimension	24.0 ft
Roof Pitch = #####	-----Angle = 18.4 °	E-W Dimension	37.0 ft
Eave Height = 09.0 ft		Enclosure: Enclosed	
Maximum Height = 14.0 ft		Low Rise? YES	
Mean Roof Height = 11.5 ft			

Main Wind Force:

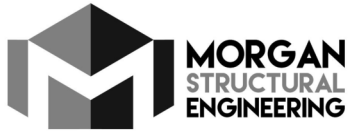
$V_{ult} = 95$ mph	(Figure 1609A)		
$V_{asd} = 74$ mph		$\alpha = 9.5$	(ASCE 7 Table 26.9.1)
$K_{zt} = 1.00$	(ASCE 7 26.8)	$z_g = 900$	(ASCE 7 Table 26.9.1)
$I_w = 1.00$	(ASCE 7 Table 1.5-2)		

WIND DISTRIBUTION ON NORTH-SOUTH ROOF														
Level	z (ft)	K_z (27.3-1)	Windward Roof			Leeward Roof			Parapet				F_{Total} (plf)	
			C_{net}	P_{net} (psf)	Height (ft)	C_{net}	P_{net} (psf)	Height (ft)	C_{net}	P_{net} (psf)	C_{net}	P_{net} (psf)		Height (ft)
L5	11.5	0.85	-0.72	-14.07	5.0	-0.66	-12.94	5.0	1.28	25.1	-0.85	-16.7	0.0	80.0

WIND DISTRIBUTION ON NORTH-SOUTH WALLS														
Level	z (ft)	K_z (27.3-1)	Windward Walls				Leeward Walls				Total Wind			
			C_{net}	P_{net} (psf)	Height (ft)	F (plf)	C_{net}	P_{net} (psf)	Height (ft)	F (plf)	Roof (plf)	Walls (plf)	0.6x Total (plf)	
L5	11.0	0.85	0.43	8.44	4.5	38.0	-0.51	-10	4.5	-45.0	80.0	83.0	97.8	

WIND DISTRIBUTION ON EAST-WEST ROOF														
Level	Windward Roof			Leeward Roof			Parapet				F _{Total} (plf)			
	z (ft)	K _z (27.3-1)	C _{net}	p _{net} (psf)	Height (ft)	C _{net}	p _{net} (psf)	Height (ft)	C _{net}	p _{net} (psf)		C _{net}	p _{net} (psf)	Height (ft)
L5	11.5	0.85	-0.72	-14.1	5.0	-0.66	-12.9	5.0	1.28	25.1	-0.85	-16.7	0.0	80.0

WIND DISTRIBUTION ON EAST-WEST WALLS													
Level	Windward Walls						Leeward Walls				Total Wind		
	z (ft)	K _z (27.3-1)	C _{net}	p _{net} (psf)	Height (ft)	F (plf)	C _{net}	p _{net} (psf)	Height (ft)	F (plf)	Roof (plf)	Walls (plf)	0.6x Total (plf)
L5	11.0	0.85	0.43	8.44	4.5	38.0	-0.51	-10	4.5	-45.0	80.0	83.0	97.8

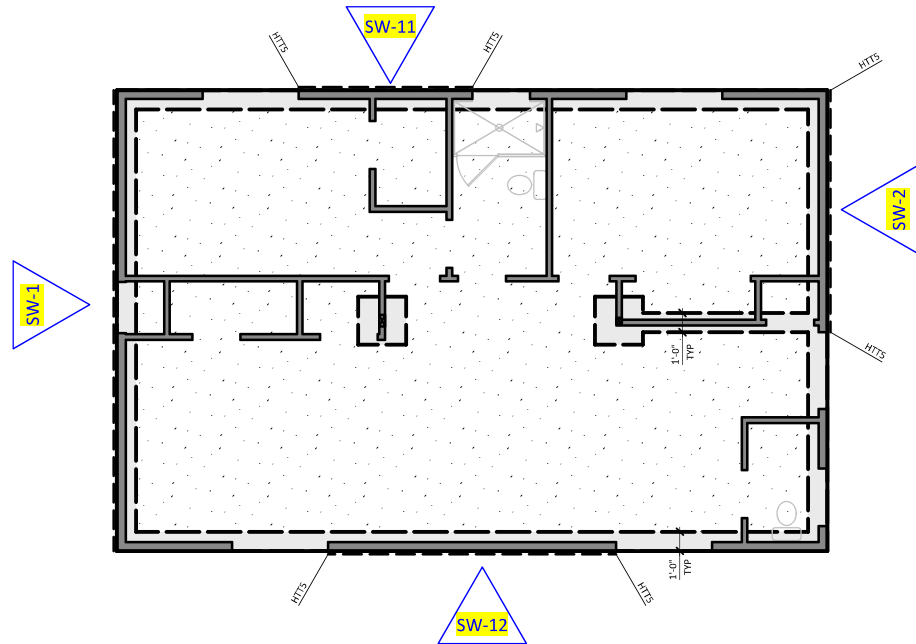


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MANTIGI ADU

901 CLYDE AVENUE
SANTA CLARA, CA 95054

DATE: 7/7/21
PROJECT #: 21.070





Job: **Mantigi**

ASD Lateral Force Analysis 2019 CBC

Building Forces		Alt.
Level	Seis. (psf)	Wind (plf)
L5	3.5	97.8
Totals:		3.5 97.8

TYPE	Materials	Sides	EQ / Wind*
6E	1/2" ST 1 10d @ 6"	1	340 / 476 plf
4E	1/2" ST 1 10d @ 4"	1	510 / 714 plf
3E	1/2" ST 1 10d @ 3"	1	665 / 931 plf
2E	1/2" ST 1 10d @ 2"	1	870 / 1218 plf
44E	1/2" ST 1 10d @ 4"	2	1020 / 1428 plf
33E	1/2" ST 1 10d @ 3"	2	1330 / 1862 plf
7			#####

Total Force = Trib Shear + Add'l Shear

Total Shear = Total Force / Wall Length

*Per CBC 2013 Section 2306.3, shearwall capacities have been increased by 40% when walls are governed by wind loading.

Wall ID	Wall Len (ft)	Wall Ht. (ft)	% of Line Load	Seismic Trib Area (ft ²)	Wind Trib (ft)	Shear		Add'l		Wall H/L Ratio	Gov. Force (lbs)	Wall Shear (plf)	Wall Gov Case	Type
						Seis (lbs)	Wind (lbs)	Seis (lbs)	Wind (lbs)					

Roof (L3)

NS

SW 1	21.00	9.00	100%	510	18.0	1780	1760	0	0	3/7:1	1780	85 Seis	6
SW 2	12.00	9.00	100%	510	18.0	1780	1760	0	0	3/4:1	1780	148 Seis	6

EW

SW 11	9.00	9.00	100%	510	12.0	1780	1174	0	0	1:1	1780	198 Seis	6
SW 12	15.00	9.00	100%	510	12.0	1780	1174	0	0	3/5:1	1780	119 Seis	6



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ASD Lateral Force Analysis 2019 CBC

REDUNDANCY FACTOR CALCULATION

Is the structure regular in plan at all levels? NO
 Is the structure light framed construction? YES
 SDC D

> 35% Base Shear?	Wall ID	ASCE 12.3.4.2 a			ρ at Level	ρ per wall
		Wall Capacity (lbs)	H/L	% Capacity		
YES	Roof (L3)					
	NS	11220	(Total Story Strength)		1.0	
	SW 1	7140	0.43	N/A		1.0
	SW 2	4080	0.75	N/A		1.0
	EW	8160	Story Strength)		1.0	
	SW 11	3060	1.00	N/A		1.0
	SW 12	5100	0.60	N/A		1.0

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ASD Lateral Force Analysis 2019 CBC

Description of Variables:	L	Length of wall	Pl	Left point load
	H	Height of wall	Px	Point load at Xp
	v	Unit shear on wall	Pr	Right point load
	Wt	Unit weight of wall	Xp	Location of Px
	Wdl	Dead load on wall	Wx	Location of Wall Above

Seismic: $HD = (\rho 0.7M_{OT} - (0.6 - 0.14 * S_{DS})M_R) / L$ (CBC 1605.3.2, ASCE 12.4.2.3)

Wind: $HD = (0.6MOT - 0.6M_R) / L$ (CBC 1605.3.2, ASCE 2.4.1)

Wall ID	L (ft)	H (ft)	V (lbs)	Wt (psf)	Wdl (plf)	Pl (lbs)	Px (lbs)	Pr (lbs)	Xp (ft)	Wall Above	Aligned Sides	Gov. Case
---------	--------	--------	---------	----------	-----------	----------	----------	----------	---------	------------	---------------	-----------

Roof (L3)
NS

SW 1	24.00	9.00	1780	10	30	0	1400	0	12	0	N/A	Seis
SW 2	11.50	9.00	1780	10	30	0	0	0	0	0	N/A	Seis

EW

SW 11	8.50	9.00	1780	10	119	0	0	0	0	0	N/A	Seis
SW 12	14.50	9.00	1780	10	119	0	0	0	0	0	N/A	Seis



Job: **Mantigi**

ASD Lateral Force Analysis 2019 CBC

Description	Mot	Overturing Moment
of Variables:	Mr Left	Resisting Moment about the Left side of the wall
	Mr Right	Resisting Moment about the Right side of the wall
	HD Left	Hold down force on the left side of the wall
	HD Right	Hold down force on the right side of the wall

Seismic: $HD = (\rho 0.7M_{OT} - (0.6 - 0.14 * S_{DS})M_R) / L$ (ASCE 12.4.2.3)

Wind: $HD = (0.6M_{OT} - 0.6M_R) / L$ (ASCE 2.4.1)

Wall ID	M _{OT} (lb-ft)	M _{R Left} (lb-ft)	M _{R Right} (lb-ft)	HD Left (lb)	HD Right (lb)	Gov.	Use Left	Use Right
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Roof (L3)

NS

SW 1	22879	48120	48120	-199	-199	Seis	OK	OK
SW 2	22879	8280	8280	1082	1082	Seis	HTT5	HTT5

EW

SW 11	22879	7994	7994	1478	1478	Seis	HTT5	HTT5
SW 12	22879	22729	22729	427	427	Seis	HTT5	HTT5



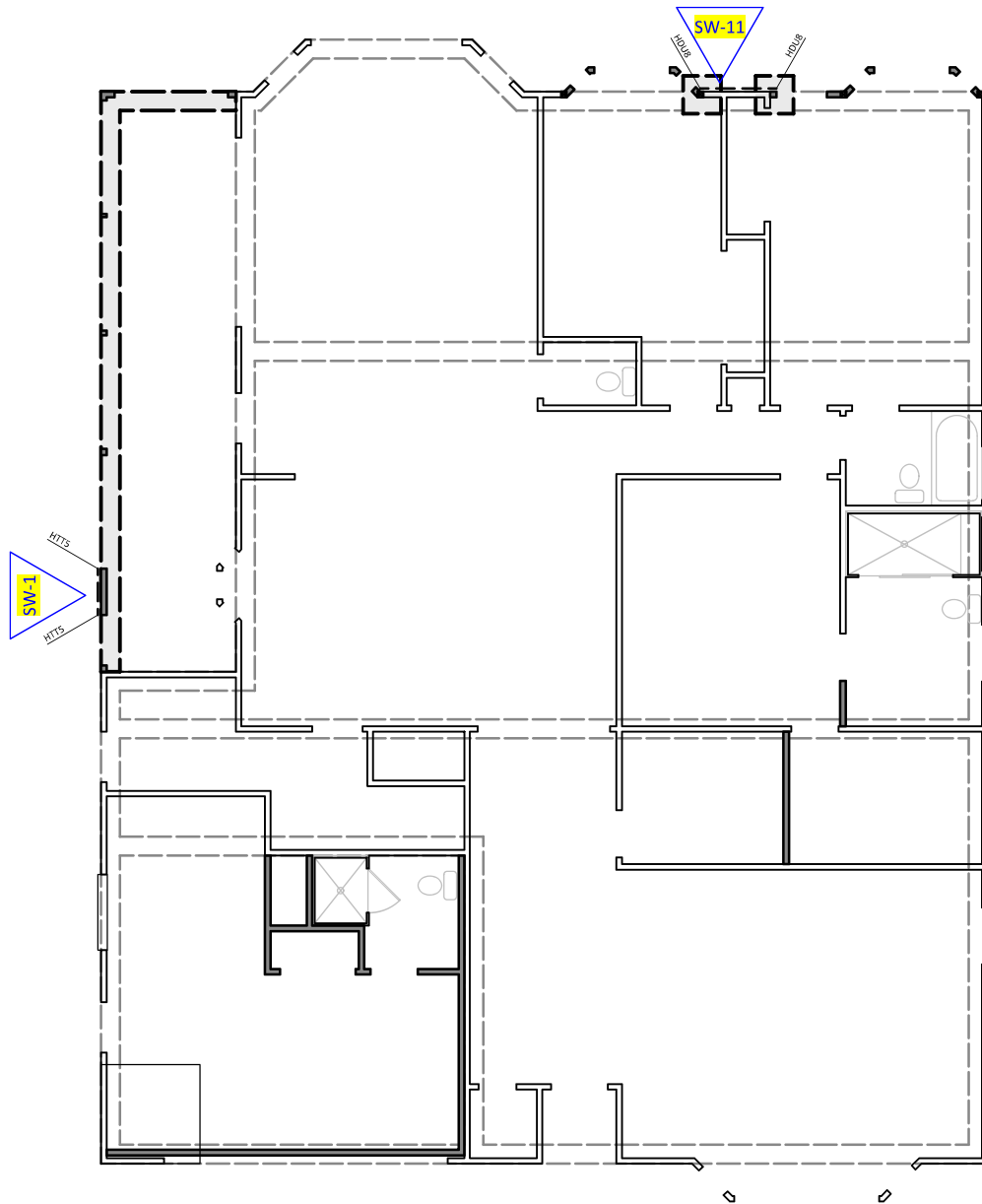
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MANTIGI ADU

901 CLYDE AVENUE
SANTA CLARA, CA 95054

DATE: 7/7/21
PROJECT #: 21.070





Job: **Mantigi Remodel**

ASD Lateral Force Analysis 2019 CBC

Building Forces		Alt.
Level	Seis. (psf)	Wind (plf)
L5	3.5	97.8
Totals:		3.5 97.8

TYPE	Materials	Sides	EQ / Wind*
6E	1/2" ST 1 10d @ 6"	1	340 / 476 plf
4E	1/2" ST 1 10d @ 4"	1	510 / 714 plf
3E	1/2" ST 1 10d @ 3"	1	665 / 931 plf
2E	1/2" ST 1 10d @ 2"	1	870 / 1218 plf
44E	1/2" ST 1 10d @ 4"	2	1020 / 1428 plf
33E	1/2" ST 1 10d @ 3"	2	1330 / 1862 plf
7			#####

Total Force = Trib Shear + Add'l Shear

Total Shear = Total Force / Wall Length

*Per CBC 2013 Section 2306.3, shearwall capacities have been increased by 40% when walls are governed by wind loading.

Wall ID	Wall Len (ft)	Wall Ht. (ft)	% of Line Load	Seismic Trib Area (ft ²)	Wind Trib (ft)	Shear		Add'l		Wall H/L Ratio	Gov. Force (lbs)	Wall Shear (plf)	Wall Gov Case	Type
						Seis (lbs)	Wind (lbs)	Seis (lbs)	Wind (lbs)					
SW 1	2.50	8.00	100%	110	3.5	384	342	0	0	3 1/5:1	384	154	Seis	6
SW 11	4.00	8.00	100%	800	16.0	2791	1565	0	0	2:1	2791	698	Seis	2

Roof (L3)

NS														
SW 1	2.50	8.00	100%	110	3.5	384	342	0	0	3 1/5:1	384	154	Seis	6
EW														
SW 11	4.00	8.00	100%	800	16.0	2791	1565	0	0	2:1	2791	698	Seis	2



Job: **Mantigi Remodel**

ASD Lateral Force Analysis 2019 CBC

REDUNDANCY FACTOR CALCULATION

Is the structure regular in plan at all levels? NO
 Is the structure light framed construction? YES
 SDC D

> 35% Base Shear?	Wall ID	ASCE 12.3.4.2 a			ρ at Level	ρ per wall
		Wall Capacity (lbs)	H/L	% Capacity		
YES	Roof (L3)					
	NS	11220	(Total Story Strength)		1.0	
	SW 1	7140	0.43	N/A		1.0
	SW 2	4080	0.75	N/A		1.0
	EW	8160	Story Strength)		1.0	
	SW 11	3060	1.00	N/A		1.0
	SW 12	5100	0.60	N/A		1.0



Job: **Mantigi Remodel**

ASD Lateral Force Analysis 2019 CBC

Description of Variables:	L	Length of wall	Pl	Left point load
	H	Height of wall	Px	Point load at Xp
	v	Unit shear on wall	Pr	Right point load
	Wt	Unit weight of wall	Xp	Location of Px
	Wdl	Dead load on wall	Wx	Location of Wall Above

Seismic: $HD = (\rho 0.7M_{OT} - (0.6 - 0.14 * S_{DS})M_R) / L$ (CBC 1605.3.2, ASCE 12.4.2.3)

Wind: $HD = (0.6MOT - 0.6M_R) / L$ (CBC 1605.3.2, ASCE 2.4.1)

Wall ID	L (ft)	H (ft)	V (lbs)	Wt (psf)	Wdl (plf)	Pl (lbs)	Px (lbs)	Pr (lbs)	Xp (ft)	Wall Above	Aligned Sides	Gov. Case
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Roof (L3)

NS												
SW 1	2.00	8.00	384	10	30	0	0	0	0	0	N/A	Seis
EW												
SW 11	3.50	8.00	2791	10	30	0	0	0	0	0	N/A	Seis



Job: **Mantigi Remodel**

ASD Lateral Force Analysis 2019 CBC

Description	Mot	Overturning Moment
of Variables:	Mr Left	Resisting Moment about the Left side of the wall
	Mr Right	Resisting Moment about the Right side of the wall
	HD Left	Hold down force on the left side of the wall
	HD Right	Hold down force on the right side of the wall

Seismic: $HD = (\rho 0.7M_{OT} - (0.6 - 0.14 * S_{DS})M_R) / L$ (ASCE 12.4.2.3)

Wind: $HD = (0.6MOT - 0.6M_R) / L$ (ASCE 2.4.1)

Wall ID	M _{OT} (lb-ft)	M _{R Left} (lb-ft)	M _{R Right} (lb-ft)	HD Left (lb)	HD Right (lb)	Gov.	Use Left	Use Right
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Roof (L3)

NS

SW 1 4386 275 275 1476 1476 Seis HTT5 HTT5

EW

SW 11 31902 770 770 6285 6285 Seis HDU8 HDU8

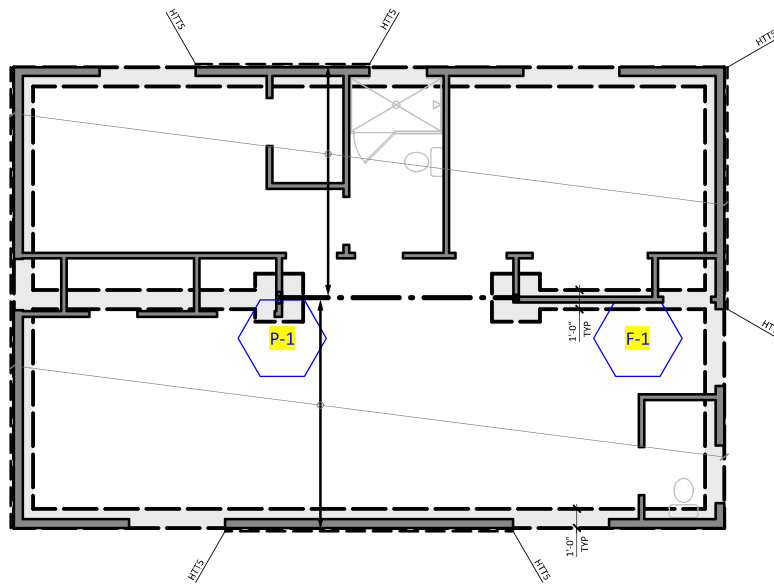


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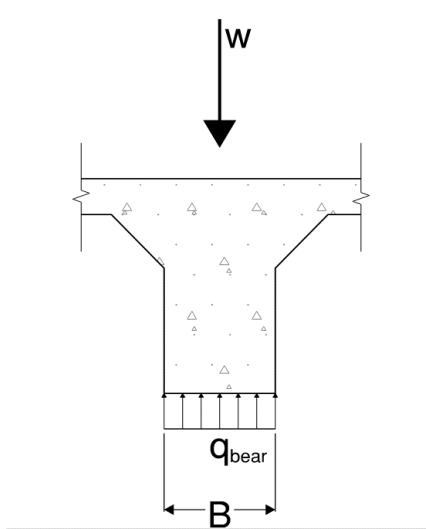
CODES/NOTES

CONTINUOUS STRIP FOUNDATION

Mark **F-1**

	Roof				Dead	Roof	Live
	Dead	Live	Live	Trib	Load	Load	Load
	(psf)	(psf)	(psf)	(Ft)	(plf)	(plf)	(plf)
Roof:	17	20	0	12.0	204	240	0
Floor:	20	0	40	0.0	0	0	0
Ext. Wall:	20	0	0	12.0	240	0	0
Int. Wall:	10	0	0	0.0	0	0	0

Total: 444 240 0
 Line Load (w): **684**



B = 1.00 ft
 = 12 in

q_{bear} = 684 psf
 q_{allow} = 1500 psf

Per CBC 1806.2

D/C = 0.46 Selected Width Ok

