

STRUCTURAL CALCULATIONS
FOR
FIRE RESTORATION
AT

1604 GROVETON WAY
MODESTO, CALIFORNIA



DATE: July 7, 2023

JOB # ITC 066-23

PROJECT DESCRIPTION

FIRE RESTORATION FOR AN EXISTING SINGLE STORY RESIDENCE WITH AN ATTACHED GARAGE IN MODESTO, CA. CONSTRUCTION TO BE CONVENTIONAL WOOD FRAMING WITH PREMANUFACTURED TRUSSES. FOUNDATION TO REMAIN AS SLAB ON GRADE WITH CONVENTIONAL CONCRETE SPREAD/STRIP FOOTINGS.

LOAD SUMMARY

A. RISK CATEGORY II

B. NUMBER OF STORIES 1

C. ROOF LOADING:

1. <u>DEAD LOAD</u>	19.0 PSF
2. <u>LIVE LOAD</u>	20.0 PSF

D. SNOW LOADING:

1. <u>GROUND SNOW LOAD</u>	0.0 PSF
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E. FLOOR LOADING:

1. <u>DEAD LOAD</u>	N/A
2. <u>LIVE LOAD</u>	N/A

F. WALL LOADING:

1. <u>EXTERIOR DEAD LOAD</u>	18.0 PSF
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G. WIND LOADING:

1. <u>BASIC WIND SPEED (V)</u>	95 MPH
2. <u>EXPOSURE CATEGORY</u>	C
3. <u>VELOCITY PRESSURE (q_h)</u>	16.7 PSF

H. SEISMIC LOADING:

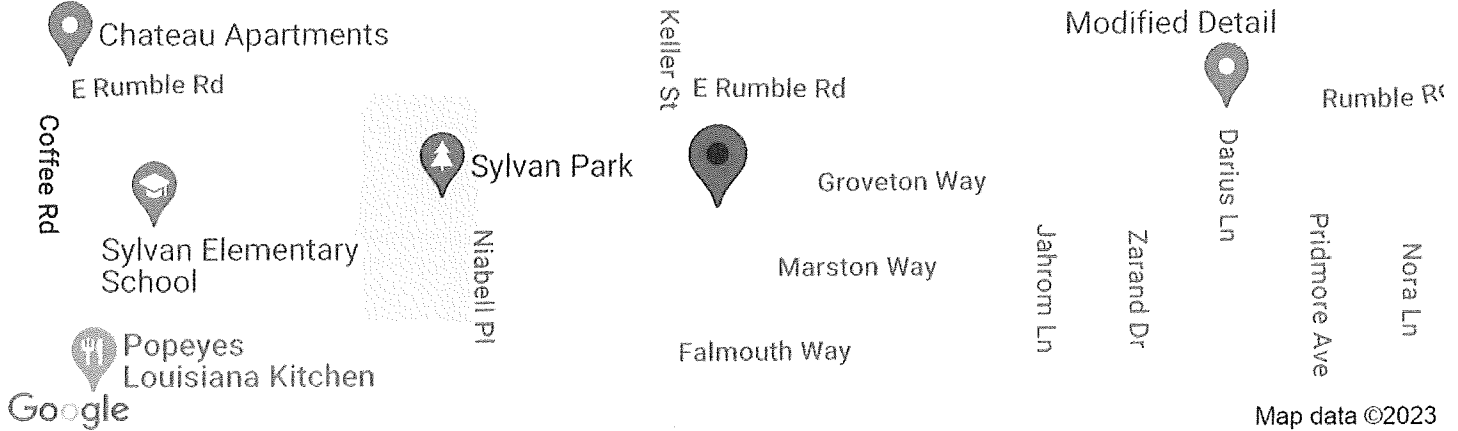
1. <u>S_s</u>	0.652
2. <u>S_1</u>	0.261
3. <u>S_{Ds}</u>	0.556
4. <u>S_{D1}</u>	0.362
5. <u>SDC</u>	D



OSHPD

1604 Groveton Way, Modesto, CA 95355, USA

Latitude, Longitude: 37.6807814, -120.969599



Date	7/7/2023, 8:19:25 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S _S	0.652	MCE _R ground motion. (for 0.2 second period)
S ₁	0.261	MCE _R ground motion. (for 1.0s period)
S _{MS}	0.833	Site-modified spectral acceleration value
S _{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S _{DS}	0.556	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	1.279	Site amplification factor at 0.2 second
F _v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.273	MCE _G peak ground acceleration
F _{PGA}	1.327	Site amplification factor at PGA
PGA _M	0.362	Site modified peak ground acceleration
T _L	12	Long-period transition period in seconds
SsRT	0.652	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	0.685	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	1.5	Factored deterministic acceleration value. (0.2 second)
S1RT	0.261	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.275	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.6	Factored deterministic acceleration value. (1.0 second)
PGAd	0.5	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA _{UH}	0.273	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C _{RS}	0.951	Mapped value of the risk coefficient at short periods
C _{R1}	0.952	Mapped value of the risk coefficient at a period of 1 s

ROOF LOADING**A. DEAD LOADS AT ROOF:**TYPICAL LOADING

ROOFING (ASPHALT SHINGLES)	4.0 PSF
SHEATHING (1/2" PLY)	1.5 PSF
FRAMING (TRUSSES)	3.0 PSF
CEILING (5/8" GYP.)	2.8 PSF
INSULATION	1.5 PSF
MEP	2.0 PSF
SOLAR PANELS	3.0 PSF
MISC.	1.2 PSF

TOTAL = 19.0 PSF

B. LIVE LOAD AT ROOF (PER CBC TABLE 1607.1):

	<u>L₀</u>
ORDINARY ROOF	20 PSF

REDUCE LOAD

FOR AREA	L ₀
300 FT ²	18 PSF
400 FT ²	16 PSF
500 FT ²	14 PSF
600 FT ²	12 PSF

(NO REDUCTION FOR SLOPE USED, THEREFORE NO DEAD LOAD INCREASE FOR SLOPE NEEDED)

C. SNOW LOADING:

		(I _s)	
GROUND SNOW LOAD	$p_g = 0 \text{ PSF}$	$\times 1.0$	<u>0.0 PSF</u>
FLAT ROOF SNOW LOAD	$p_f = 0 \text{ PSF}$	$\times 1.0$	<u>0.0 PSF</u>

(SEE ENERCALC PRINTOUT FOR DETERMINATION OF FLAT ROOF SNOW LOAD)

D. EFFECTIVE SEISMIC WEIGHT (PER ASCE SECTION 12.7.2):

DEAD LOAD = 19.0 PSF

TOTAL = 19.0 PSF

Wood Beam

Project File: ITC 066-23.ec6

LIC#: KW-06017623, Build:20.23.04.05

PELTON WYLIE & FAHRNEY ENGINEERING, INC.

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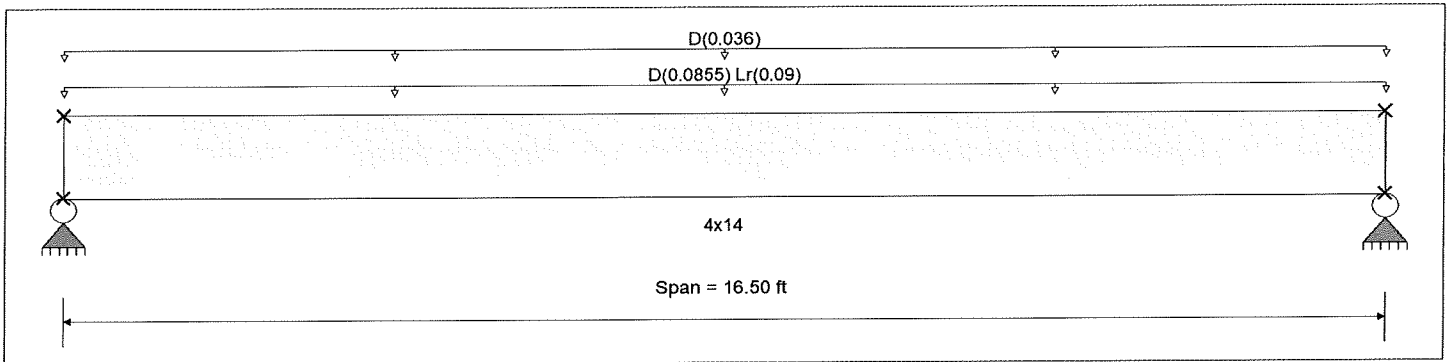
DESCRIPTION: (E) GARAGE HEADER

CODE REFERENCES

Calculations per NDS 2018, IBC 2021, ASCE 7-16
 Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design	Fb +	900 psi	E : Modulus of Elasticity	
Load Combination : IBC 2021	Fb -	900 psi	Ebend- xx	1600ksi
	Fc - Prll	1350 psi	Eminbend - xx	580ksi
Wood Species : Douglas Fir-Larch	Fc - Perp	625 psi		
Wood Grade : No.2	Fv	180 psi		
	Ft	575 psi	Density	31.21 pcf
Beam Bracing : Completely Unbraced				



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load : D = 0.0190, Lr = 0.020 ksf, Tributary Width = 4.50 ft, (ROOF)

Uniform Load : D = 0.0180 ksf, Tributary Width = 2.0 ft, (WALL)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.843	1	Maximum Shear Stress Ratio	=	0.228	: 1
Section used for this span		4x14		Section used for this span		4x14	
fb: Actual	=	883.46	psi	fv: Actual	=	51.35	psi
F'b	=	1,048.43	psi	F'v	=	225.00	psi
Load Combination		+D+Lr		Load Combination		+D+Lr	
Location of maximum on span	=	8.250	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	0.139 in	Ratio =	1423 >=360	Span: 1 : Lr Only			
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a			
Max Downward Total Deflection	0.342 in	Ratio =	578 >=240	Span: 1 : +D+Lr			
Max Upward Total Deflection	0 in	Ratio =	0 <240	n/a			

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+Lr	1	0.3423	8.310		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.828	1.828
Max Upward from Load Combinations	1.828	1.828
Max Upward from Load Cases	1.085	1.085
D Only	1.085	1.085
+D+Lr	1.828	1.828
+D+0.750Lr	1.642	1.642
+0.60D	0.651	0.651
Lr Only	0.743	0.743