

**CITY OF SACRAMENTO**

1231 I Street, Sacramento, CA 95814

Permit No: 0507147

Insp Area: 4

Thos Bros: 277H7

Site Address: 519 GARDEN ST SAC

Parcel No: 275-0233-014

Sub-Type: RES

Housing (Y/N): N

**CONTRACTOR**

CAL-VINTAGE ROOFING CO INC  
11257 COLOMA RD, SUITE A-3  
GOLD RIVER, CA 95670

**OWNER**

CROSS BILL/MARGARET  
519 GARDEN ST  
SACRAMENTO, CA 95815

**ARCHITECT**

**Nature of Work:** T/O RE-ROOF RE-SHEET OF 22 SQS & INSTALL ENGINEERING LIGHT WEIGHT TILE

**CONSTRUCTION LENDING AGENCY :** I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C).

Lender's Name \_\_\_\_\_ Lender's Address \_\_\_\_\_

**LICENSED CONTRACTORS DECLARATION:** I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.

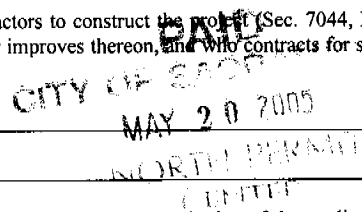
X License Class C-39 License Number 826725 Date 5/20/2005 Contractor Signature [Signature]

**OWNER-BUILDER DECLARATION:** I hereby affirm under penalty of perjury that I am exempt from the contractors License Law for the following reason (Sec. 7031.5, Business and Professions Code; any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 8 of the Business and Professions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars (\$500.00);

I, as a owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professional Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or herself or through his/her own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he/she did not build or improve for the purpose of sale.)

I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law).

I am exempt under Sec. \_\_\_\_\_ B & PC for this reason: \_\_\_\_\_  
Date \_\_\_\_\_ Owner Signature \_\_\_\_\_



**IN ISSUING THIS BUILDING PERMIT,** the applicant represents, and the city relies on the representation of the applicant, that the applicant verified all measurements and locations shown on the application or accompanying drawings and that the improvement to be constructed does not violate any law or private agreement relating to permissible or prohibited locations for such improvements. This building permit does not authorize any illegal location of any improvement or the violation of any private agreement relating to location of improvements.

I certify that I have read this application and state that all information is correct. I agree to comply with all city and county ordinances and state laws relating to building construction and hereby authorize representative(s) of this city to enter upon the abovementioned property for inspection purposes.

X Date 5/20/2005 Applicant/Agent Signature [Signature]

**WORKER'S COMPENSATION DECLARATION:** I hereby affirm under penalty of perjury one of the following declarations:

I have and will maintain a certificate of consent to self-insure for workers' compensation as provided for by Section 3700 of the Labor Code, for the performance of work for which the permit is issued.

[Signature] I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier STATE COMPENSATION INS FUND Policy Number 285000236404 Exp Date 03/01/2006

(This section need not be completed if the permit is for \$100 or less) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

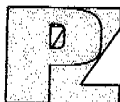
X Date 5/20/2005 Applicant Signature [Signature]

**WARNING:** FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000) IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST AND ATTORNEY'S FEE.

**THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK IS NOT COMMENCED WITHIN 180 DAYS.**



Cross



Paul Zacher - Structural Engineers, Inc  
4701 Lakeside Way  
Fair Oaks, CA 95628

TEL: 916.961.3960  
FAX: 916.961.6552

### RECOMMENDATIONS:

If any of the following recommendations do not correspond to actual field conditions, the engineer of record shall be notified for further investigation and evaluation before continuing work.

#### Roof Structure:

1. Scab a 2x6 rafter to the existing 2x4 rafters with 16d's @ 12" on center where the span is greater than 8'-0". The rafter to be scabbed to the existing rafter may be held short of the intersecting bearing wall, hip, valley, ridge or purlin by no more than 4". See detail 1.
2. Scab a 1 3/4" x 11 1/4" LVL to the existing header. Jack up the existing beam as required where the existing sag occurs to provide an even contour at the roof level before installation of the LVL. See details 1 and 2.
3. Scab three (3) 2x4 rafters to the existing 2x4 rafter with 16d's @ 12" on center where the span is greater than 8'-0". The rafter to be scabbed to the existing rafter may be held short of the intersecting bearing wall, hip, valley, ridge or purlin by no more than 4". See detail 1.
4. Scab two (2) 2x4 rafters to the existing 2x4 rafter with 16d's @ 12" on center where the span is greater than 8'-0". The rafter to be scabbed to the existing rafter may be held short of the intersecting bearing wall, hip, valley, ridge or purlin by no more than 4". See detail 1.
5. Shim the areas as required where the existing sags occur to provide an even contour at the roof level. See detail 1.

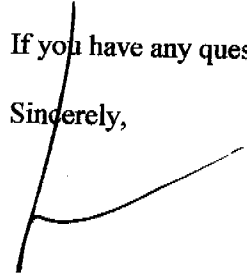
It shall be noted that small hairline cracking may occur at exterior stucco and interior gyboard finished walls that are load bearing or distributing roof strut loads. These cracks are a natural occurrence as the existing structure re-distributes the new roof weight. They are cosmetic in nature and are not an indication of a structural hazard or failure.

It shall be noted that some deflection of the rafters may be evident after installation of the tile. The existing roof framing has deflected but this may not be readily evident due to the uneven nature of the existing roofing material. Concrete tile is a very consistent and uniform product and when installed in an even plane, even small deflections can become apparent. This is only a cosmetic issue and not a structural concern.

The inspection consisted of visual observation only, made solely to determine the structural capacity of the existing roof. Analysis does not determine any effects on the overall structure under lateral forces or effects on the foundation unless specifically noted in the calculations and in this document. No warranties, expressed or implied, are made or intended in conjunction with this report. The inspection was made only to the portions that were accessible. The specific items noted were those that were observable and there may be defects that are not observable, or are hidden by architectural and structural materials.

If you have any questions on the above, do not hesitate to call.

Sincerely,



Paul Zacher, P.E., S.E.



Job #: 05\_094

TEL: (916) 961-3960

Date: 03/28/2005

FAX: (916) 961-6552

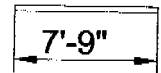
LOADING:

Rafter:

Dr = 11.2 psf x 2'-0" = 22.4 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

2x4 #2

22.4 / 32.0

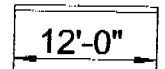


Rafter:

Dr = 11.2 psf x 2'-0" = 22.4 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

2x4 #2 + 2x6 #2

22.4 / 32.0

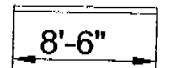


Vault:

Dr = 14.4 psf x 2'-0" = 28.8 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

2-2x4 #2

28.8 / 32.0

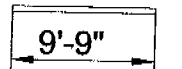


Vault:

Dr = 14.4 psf x 2'-0" = 28.8 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

3-2x4 #2

28.8 / 32.0

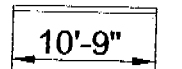


Vault:

Dr = 14.4 psf x 2'-0" = 28.8 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

4-2x4 #2

28.8 / 32.0

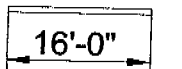


B2:

Dr = 14.4 psf x 11'-0" = 158 plf  
Lr = 16.0 psf x 11'-0" = 176 plf

4x12 #2 + 1-3/4"x11-1/4" LVL

158 / 176



Scope :

Rev: 580006  
 User: KW-0602844, Ver 5.8.0, 1-Dec-2003  
 (c)1983-2003 ENERCALC Engineering Software

**Timber Beam & Joist**

Cross.ecw.Calculations

**Description RAFTERS AND BEAMS**

**Timber Member Information** Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000. Base allowables are user defined

	rafter	rafter	vault	vault	vault	B1
<b>Timber Section</b>	2x4	2x6	2-2x4	3-2x4	4-2x4's lx12#2+1.75x11.875	
Beam Width	in 1.500	1.500	3.000	4.500	6.000	6.186
Beam Depth	in 3.500	5.500	3.500	3.500	3.500	11.250
Le: Unbraced Length	ft 0.00	0.00	0.00	0.00	0.00	0.00
Timber Grade	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2	Custom, DF#2 + LVL
Fb - Basic Allow	psi 875.0	875.0	875.0	875.0	875.0	1,450.0
Fv - Basic Allow	psi 95.0	95.0	95.0	95.0	95.0	1,670.0
Elastic Modulus	ksi 1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	1,666.7
Load Duration Factor	1.250	1.250	1.250	1.250	1.250	1.250
Member Type	Sawn	Sawn	Sawn	Sawn	Manuf/Pine	Manuf/Pine
Repetitive Status	Repetitive	Repetitive	Repetitive	Repetitive	Repetitive	No

**Center Span Data**

	ft	7.75	12.00	8.50	9.75	10.75	16.00
Span	ft	7.75	12.00	8.50	9.75	10.75	16.00
Dead Load	#/ft	22.40	22.40	28.80	28.80	28.80	158.00
Live Load	#/ft	32.00	32.00	32.00	32.00	32.00	176.00

**Results**

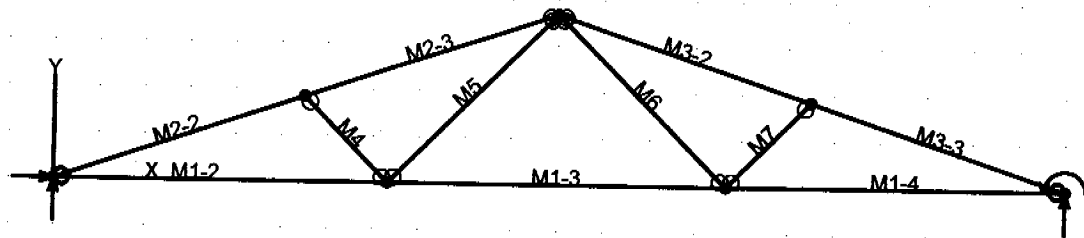
	Ratio =	0.8482	0.9502	0.5702	0.5001	0.6840	0.5423
Mmax @ Center	in-k	4.90	11.75	6.59	8.67	10.54	128.26
@ X =	ft	3.87	6.00	4.25	4.87	5.37	8.00
fb : Actual	psi	1,600.4	1,553.8	1,075.8	943.6	860.4	982.9
Fb : Allowable	psi	1,886.7	1,635.2	1,886.7	1,886.7	1,257.8	1,812.5
		Bending OK	Bending OK	Bending OK	Bending OK	Bending OK	Bending OK
fv : Actual	psi	55.9	55.1	34.6	26.6	22.2	51.1
Fv : Allowable	psi	118.8	118.8	118.8	118.8	118.8	2,087.5
		Shear OK	Shear OK	Shear OK	Shear OK	Shear OK	Shear OK

**Reactions**

@ Left End	DL	lbs	86.80	134.40	122.40	140.40	154.80	1,264.00
	LL	lbs	124.00	192.00	136.00	156.00	172.00	1,408.00
	Max. DL+LL	lbs	210.80	326.40	258.40	296.40	326.80	2,672.00
@ Right End	DL	lbs	86.80	134.40	122.40	140.40	154.80	1,264.00
	LL	lbs	124.00	192.00	136.00	156.00	172.00	1,408.00
	Max. DL+LL	lbs	210.80	326.40	258.40	296.40	326.80	2,672.00

**Deflections**

	Ratio OK	Deflection OK	Deflection OK	Deflection OK	Deflection OK	Deflection OK
Center DL Defl	in	-0.212	-0.314	-0.197	-0.228	-0.252
L/Defl Ratio		438.6	458.5	517.2	514.0	511.3
Center LL Defl	in	-0.303	-0.449	-0.219	-0.253	-0.280
L/Defl Ratio		307.0	320.9	465.4	462.6	460.2
Center Total Defl	in	-0.515	-0.763	-0.416	-0.481	-0.533
Location	ft	3.875	6.000	4.250	4.875	5.375
L/Defl Ratio		180.6	188.8	245.0	243.5	242.2
						476.9



# Truss 1

VisualAnalysis 4.00 Report

Company: Paul Zacher - Structural - Engineers Engineer: Paul Zacher

File: C:\Documents and Settings\Owner\Desktop\Cross\_094\Truss 1.vap

## Nodes

Node	X ft	Y ft	Fix	DX	Fix	DY	Fix	RZ
N1	0.00	0.00	Yes		Yes		No	
N2	22.00	0.00	No		"		Yes	
N3	11.00	3.67	"		No		No	
N4	7.33	0.00	"		"		"	
N5	14.67	0.00	"		"		"	
N6	5.50	1.84	"		"		"	
N7	16.50	1.84	"		"		"	

## Member Elements

Member	Section	Material	Length ft
M1-2	SS2x4	Wood	7.33
M1-3	"	"	7.33
M1-4	"	"	7.33
M2-2	"	"	5.80
M2-3	"	"	5.80
M3-2	"	"	5.80
M3-3	"	"	5.80
M4	"	"	2.59
M5	"	"	5.19
M6	"	"	5.19
M7	"	"	2.59

## Section Properties

Category	Section	Ax in <sup>2</sup>	Iz in <sup>4</sup>	Sy+ in <sup>3</sup>	Sy- in <sup>3</sup>
Wood Sha	SS2x4	5.25	5.36	3.06	3.06

## Material Properties

Material	Strength psi	Elasticity psi	Poisson	Density lb/ft <sup>3</sup>
Wood	-NA-	1800000.00	0.36	40.47

## Load Combination Summary

Equation Case: UBC97 12.8a

Combination: 1D+1Lr

Contributing Cases & Source

Dead Load (Dead loads)

Roof Live Load (Roof Live loads)

## Nodal Reactions

Node	Load Case	FX	FY	MZ
			7	



		lb	lb	lb-ft
N1	UBC97 12.8a	0.00	662.20	-NA-
N2	"	-NA-	662.20	0.00

## Member Results

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M1-2	1568.44	-35.67	-30.33	0.01	-0.13
"	1568.44	-14.65	31.15	0.01	-0.12
"	1568.44	6.38	41.26	0.00	-0.08
"	<b>1568.44</b>	27.40	0.00	0.00	0.00
M1-3	984.91	-31.53	-30.33	0.02	-0.13
"	984.91	-10.51	21.04	0.02	-0.15
"	984.91	10.51	21.04	0.02	-0.15
"	984.91	31.53	-30.33	0.01	-0.13
M1-4	1568.44	-27.40	0.00	0.04	0.00
"	1568.44	-6.38	41.26	0.03	-0.08
"	1568.44	14.65	31.15	0.03	-0.12
"	1568.44	35.67	-30.33	0.02	-0.13
M2-2	<b>-1688.7</b>	105.78	0.00	0.00	0.00
"	-1658.7	16.04	<b>117.66</b>	-0.00	-0.10
"	-1628.8	-73.69	61.95	-0.01	-0.12
"	-1598.9	<b>-163.43</b>	<b>-167.12</b>	-0.01	-0.12
M2-3	-1435.7	<b>163.43</b>	-167.12	-0.01	-0.12
"	-1405.8	73.69	61.95	-0.02	-0.17
"	-1375.8	-16.04	117.66	-0.02	<b>-0.18</b>
"	-1345.9	-105.78	0.00	-0.02	-0.13
M3-2	-1435.7	-163.43	-167.12	0.05	-0.11
"	-1405.8	-73.69	61.95	0.05	-0.15
"	-1375.8	16.04	117.66	0.06	-0.17
"	-1345.9	105.78	0.00	0.06	-0.12
M3-3	-1688.7	-105.78	0.00	0.04	<b>0.01</b>
"	-1658.7	-16.04	117.66	0.04	-0.08
"	-1628.8	73.69	61.95	0.04	-0.11
"	-1598.9	<b>163.43</b>	<b>-167.12</b>	0.05	-0.11
M4	-365.31	0.00	0.00	0.10	-0.08
"	-365.31	0.00	0.00	0.10	-0.07
"	-365.31	0.00	0.00	0.10	-0.07
"	-365.31	0.00	0.00	0.10	-0.06
M5	460.30	0.00	0.00	<b>-0.08</b>	-0.10
"	460.30	0.00	0.00	-0.08	-0.10
"	460.30	0.00	0.00	-0.08	-0.10
"	460.30	0.00	0.00	-0.08	-0.10
M6	460.30	0.00	0.00	0.10	-0.08
"	460.30	0.00	0.00	<b>0.11</b>	-0.08
"	460.30	0.00	0.00	0.11	-0.07
"	460.30	0.00	0.00	0.11	-0.07
M7	-365.31	0.00	0.00	-0.07	-0.11
"	-365.31	0.00	0.00	-0.07	-0.10
"	-365.31	0.00	0.00	-0.07	-0.10
"	-365.31	0.00	0.00	-0.07	-0.09

**BENDING & COMP: TRUSS 1 - MEMBER 2-2**

Design based on 1997 UBC 2321 Division V and ANSI/TPI 1-1995

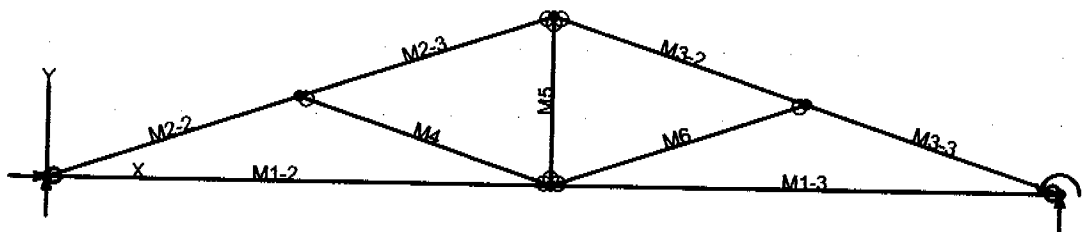
Grading:

2x or 4x                      Doug-fir larch: No. 2

Assumptions:

Solid sheathing on top chord of truss. Therefore,  
continuous lateral support is provided along compression face  
Maximum center-center spacing = 24"

Width, b	1.5 inches
Depth, d	3.5 inches
Length	5.8 feet
Max Axial Comp, C	1598 lbs
Max Reaction, R	163 lbs
Max Moment, M	167 ft-lbs
Max LL Deflection	0.06 inches
Max TL Deflection	0.12 inches
LL Defl Criteria = L/	240
TL Defl Criteria = L/	180
Duration factor, Cd	1.25
Repetitive Factor, Cr	1.15
Size Factor, Cf bending	1.5 1.5 for 2x4, 1.3 for 2x6
Size Factor, Cf comp	1.15 1.15 for 2x4, 1.1 for 2x6
Buckling Factor, CT =	1.16
fc =	304 psi
Fce=	1496 psi
Fc*=	2084 psi
F'c=	1184 psi
fb=	654 psi
F'b=Fb*=	2156 psi
Shear D/C ratio	0.39 < 1.0, Member OK
Interaction equation: (fc/F'c)^2 +	
fb/ (F'b(1-fc/Fce)) =	0.45 < 1.0, Member OK
Live Load defl ratio	0.21 < 1.0, Member OK
Total Load defl ratio	0.31 < 1.0, Member OK



# Truss 2

VisualAnalysis 4.00 Report

Company: Paul Zacher - Structural - Engineers Engineer: Paul Zacher  
 File: C:\Documents and Settings\Owner\Desktop\Cross\_094\Truss 2.vap

## Nodes

Node	X ft	Y ft	Fix DX	Fix DY	Fix RZ
N1	0.00	0.00	Yes	Yes	No
N2	15.00	0.00	No	"	Yes
N3	7.50	2.50	"	No	No
N4	7.50	0.00	"	"	"
N5	3.75	1.25	"	"	"
N6	11.25	1.25	"	"	"

## Member Elements

Member	Section	Material	Length ft
M1-2	SS2x4	Wood	7.50
M1-3	"	"	7.50
M2-2	"	"	3.95
M2-3	"	"	3.95
M3-2	"	"	3.95
M3-3	"	"	3.95
M4	"	"	3.95
M5	"	"	2.50
M6	"	"	3.95

## Section Properties

Category	Section	Ax in <sup>2</sup>	Iz in <sup>4</sup>	Sy+ in <sup>3</sup>	Sy- in <sup>3</sup>
Wood	Sha SS2x4	5.25	5.36	3.06	3.06

## Material Properties

Material	Strength psi	Elasticity psi	Poisson	Density lb/ft <sup>3</sup>
Wood	-NA-	1800000.00	0.36	40.47

## Load Combination Summary

Equation Case: UBC97 12.8a

Combination: 1D+1Lr

Contributing Cases & Source

Dead Load (Dead loads)

Roof Live Load (Roof Live loads)

## Nodal Reactions

Node	Load Case	FX lb	FY lb	MZ lb-ft
N1	UBC97 12.8a	0.00	451.50	-NA-

Node	Load Case	FX lb	FY lb	MZ lb-ft
N2	"	-NA-	451.50	0.00

## Member Results

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M1-2	1033.31	-37.96	-42.79	0.01	-0.06
"	1033.31	-16.46	25.20	0.01	-0.07
"	1033.31	5.04	39.47	0.00	-0.05
"	<b>1033.31</b>	26.54	0.00	0.00	0.00
M1-3	1033.31	-26.54	0.00	0.02	0.00
"	1033.31	-5.04	39.47	0.02	-0.05
"	1033.31	16.46	25.20	0.01	-0.07
"	1033.31	37.96	-42.79	0.01	-0.06
M2-2	<b>-1114.6</b>	76.39	0.00	0.00	0.00
"	-1094.2	15.20	<b>60.30</b>	-0.00	-0.03
"	-1073.8	-45.99	40.01	-0.00	-0.05
"	-1053.4	<b>-107.18</b>	<b>-60.87</b>	-0.01	-0.06
M2-3	-767.65	<b>107.18</b>	-60.87	-0.01	-0.06
"	-747.26	45.99	40.01	-0.01	-0.07
"	-726.86	-15.20	60.30	-0.01	-0.07
"	-706.46	-76.39	0.00	-0.01	-0.06
M3-2	-767.65	-107.18	-60.87	0.02	-0.05
"	-747.26	-45.99	40.01	0.03	-0.06
"	-726.86	15.20	60.30	0.03	-0.07
"	-706.46	76.39	0.00	<b>0.03</b>	-0.05
M3-3	-1114.6	-76.39	0.00	0.02	<b>0.01</b>
"	-1094.2	-15.20	60.30	0.02	-0.03
"	-1073.8	45.99	40.01	0.02	-0.04
"	-1053.4	107.18	-60.87	0.02	-0.05
M4	-357.28	0.00	0.00	0.03	-0.05
"	-357.28	0.00	0.00	0.03	-0.05
"	-357.28	0.00	0.00	0.03	-0.05
"	-357.28	0.00	0.00	0.03	-0.05
M5	301.87	0.00	0.00	-0.06	-0.01
"	301.87	0.00	0.00	-0.06	-0.01
"	301.87	0.00	0.00	-0.06	-0.01
"	301.87	0.00	0.00	<b>-0.06</b>	-0.01
M6	-357.28	0.00	0.00	-0.01	-0.06
"	-357.28	0.00	0.00	-0.01	-0.06
"	-357.28	0.00	0.00	-0.01	-0.06
"	-357.28	0.00	0.00	-0.01	-0.06

**BENDING & COMP: TRUSS 2 - MEMBER 2-2**

Design based on 1997 UBC 2321 Division V and ANSI/TPI 1-1995

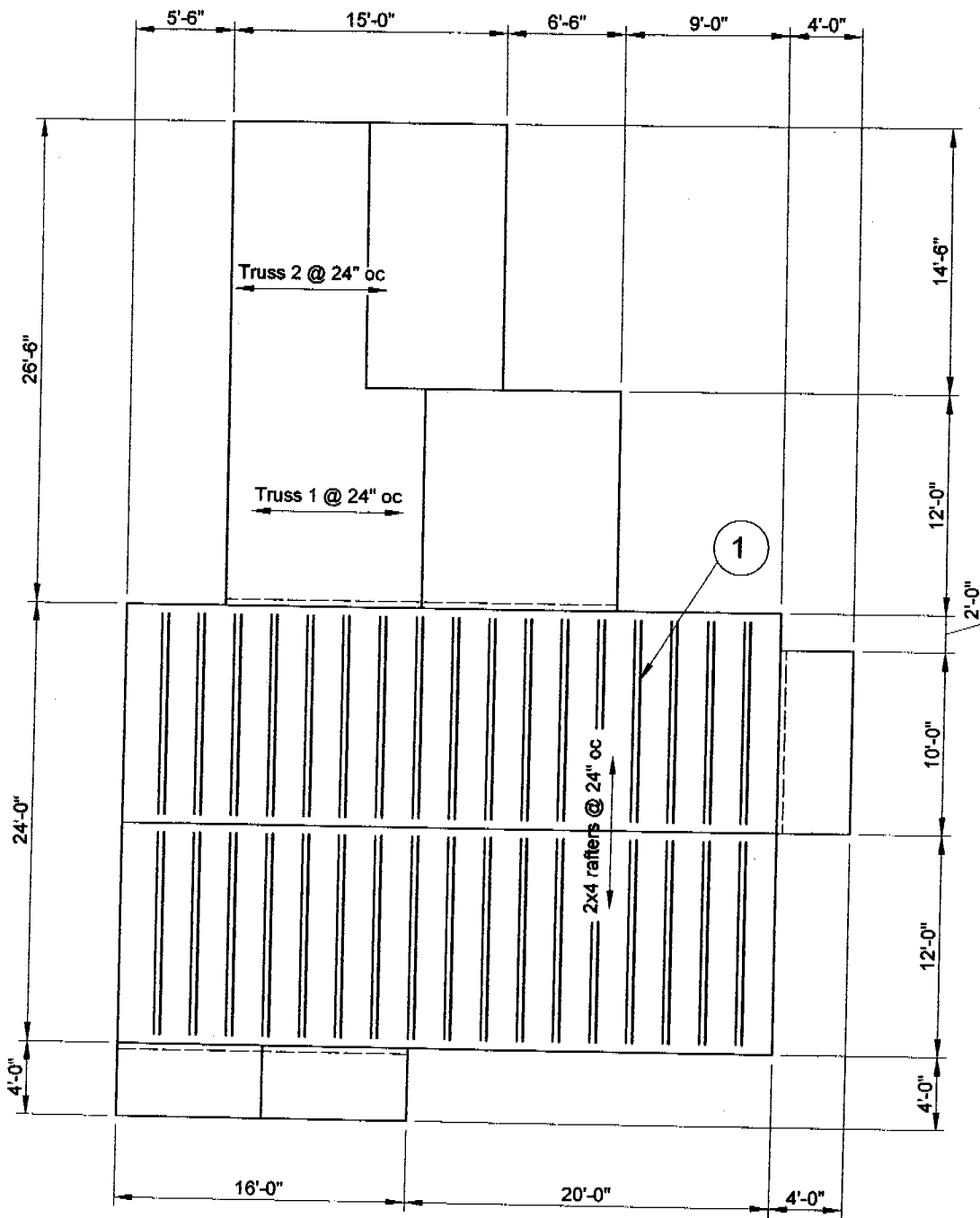
**Grading:**

2x or 4x                      Doug-fir larch: No. 2

**Assumptions:**

Solid sheathing on top chord of truss. Therefore,  
continuous lateral support is provided along compression face  
Maximum center-center spacing = 24"

Width, b	1.5 inches
Depth, d	3.5 inches
Length	3.95 feet
Max Axial Comp, C	1053 lbs
Max Reaction, R	107 lbs
Max Moment, M	60 ft-lbs
Max LL Deflection	0.03 inches
Max TL Deflection	0.06 inches
LL Defl Criteria = L/	240
TL Defl Criteria = L/	180
Duration factor, Cd	1.25
Repetitive Factor, Cr	1.15
Size Factor, Cf bending	1.5 1.5 for 2x4, 1.3 for 2x6
Size Factor, Cf comp	1.15 1.15 for 2x4, 1.1 for 2x6
Buckling Factor, CT =	1.11
fc =	201 psi
Fce=	3083 psi
Fc*=	2084 psi
F'c=	1681 psi
fb=	235 psi
F'b=Fb*=	2156 psi
Shear D/C ratio	0.26 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	
fb/ (F'b(1-fc/Fce)) =	0.13 < 1.0, Member OK
Live Load defl ratio	0.15 < 1.0, Member OK
Total Load defl ratio	0.23 < 1.0, Member OK



**FRAMING NOTES:**

1. Scab a 2x6 to existing 2x4 rafters where the span is greater than 8'-0" (total 34).

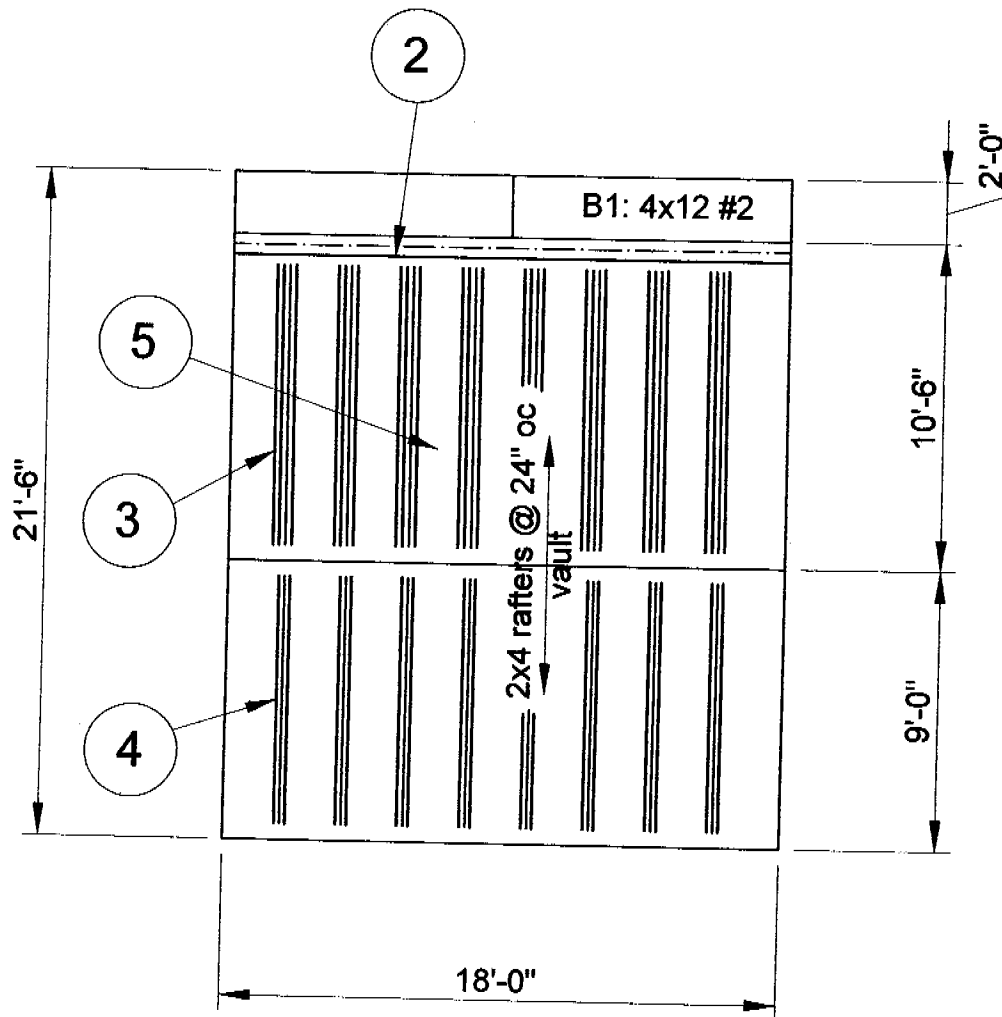
**NOTES:**

- This is a reroof project. The new roofing material shall be a Light Weight Concrete Tile. The tile shall weigh less than or equal to 7.3 psf.
- All framing members including rafters, purlins, joists and beams are existing unless otherwise noted in the framing notes above.
- All rafters are 2x4 DF#2 and hips and valleys are 2x6 DF#2 unless otherwise noted.
- All existing rafter, hips, valleys, rafter ties, and purlins are braced per UBC Section 2320.1 "Roof and Ceiling Framing" unless otherwise shown.
- All structural wood members that were observed appear to be in sound condition and without structural defect.

**1 ROOF PLAN - CROSS**  
Not to Scale

14





**FRAMING NOTES:**

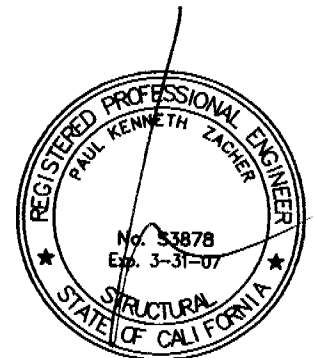
2. Scab a 1 3/4" x 11 1/4" LVL to the existing 4x12 beam. See detail 3.
3. Scab three (3) 2x4's to existing 2x4 rafters where the span is greater than 8'-0" (total 8 locations).
4. Scab two (2) 2x4's to existing 2x4 rafters where the span is greater than 8'-0" (total 8 locations).
5. Shim the areas as required where the existing sags occur to provide an even contour at the roof level.

**NOTES:**

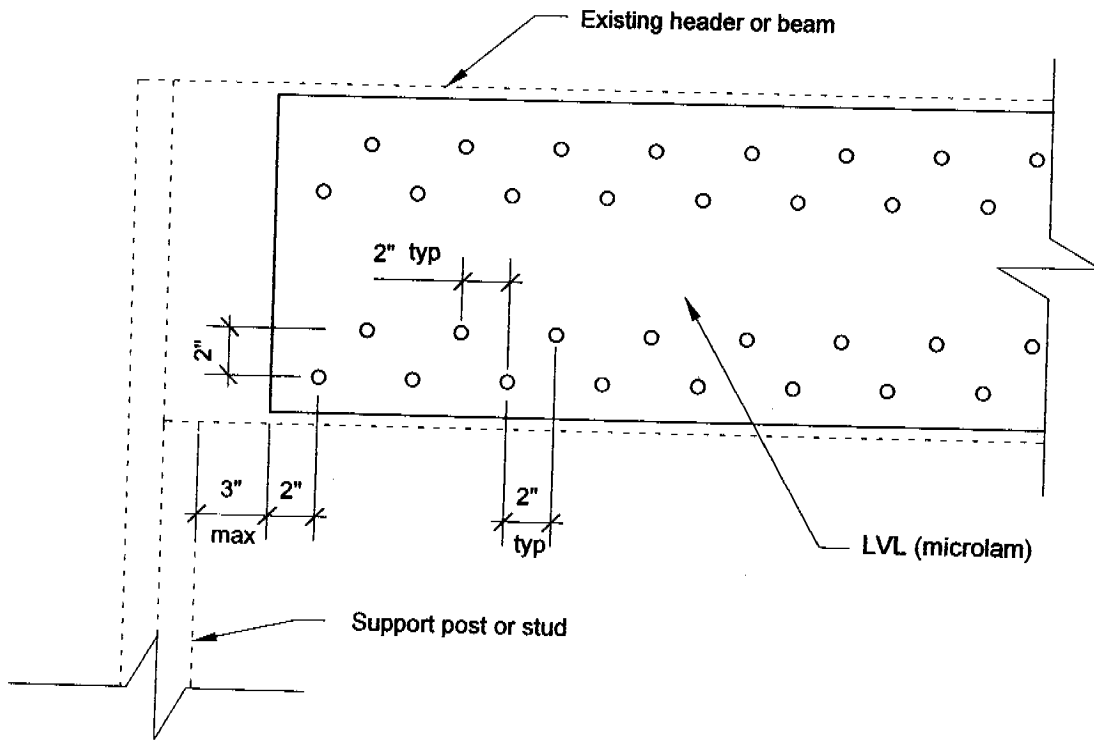
- A. This is a reroof project. The new roofing material shall be a Light Weight Concrete Tile. The tile shall weigh less than or equal to 7.3 psf.
- B. All framing members including rafters, purlins, joists and beams are existing unless otherwise noted in the framing notes above.
- C. All rafters are 2x4 DF#2 and hips and valleys are 2x6 DF#2 unless otherwise noted.
- D. All existing rafter, hips, valleys, rafter ties, and purlins are braced per UBC Section 2320.1 "Roof and Ceiling Framing" unless otherwise shown.
- E. All structural wood members that were observed appear to be in sound condition and without structural defect.

**2 ROOF PLAN - CROSS**  
Not to Scale

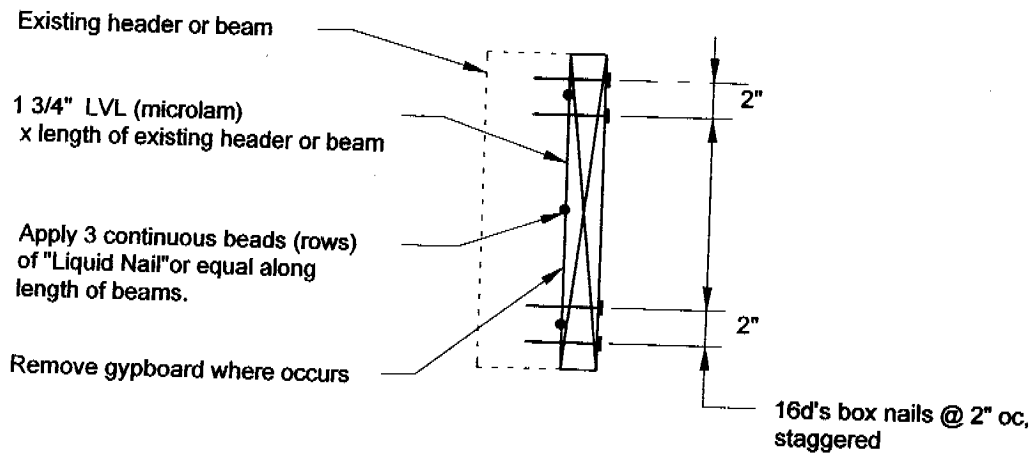
15







**ELEVATION**



**SECTION**

3

**DETAIL**

scale: 1 1/2" = 1'-0"



PAUL ZACHER- STRUCTURAL ENGINEERS, INC.

4701 Lakeside Way  
Fair Oaks, Ca 95628  
TEL: (916) 961-3960  
FAX: (916) 961-6552

Job #: 05\_094

Date: 03/28/2005

LOADING:

Rafter:

Dr = 11.2 psf x 2'-0" = 22.4 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

2x4 #2

22.4 / 32.0

7'-9"

Rafter:

Dr = 11.2 psf x 2'-0" = 22.4 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

2x4 #2 + 2x6 #2

22.4 / 32.0

12'-0"

Vault:

Dr = 14.4 psf x 2'-0" = 28.8 plf  
Lr = 16.0 psf x 2'-0" = 32.0 plf

2x8 #2

28.8 / 32.0

14'-0"

B1:

Dr = 14.4 psf x 11'-0" = 158 plf  
Lr = 16.0 psf x 11'-0" = 176 plf

4x12 #2 + 1-3/4"x11-1/4" LVL

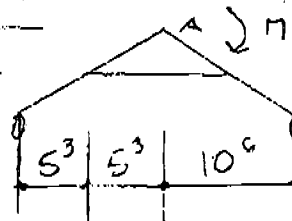
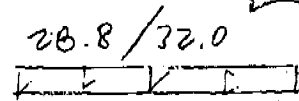
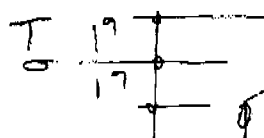
158 / 176

16'-0"

CONCRETE TIE CMC

$$M_A = 638^{\#} \times 10^6 - 638^{\#} \times 5^3 - 1.75T$$

$$T = 1914^{\#}$$



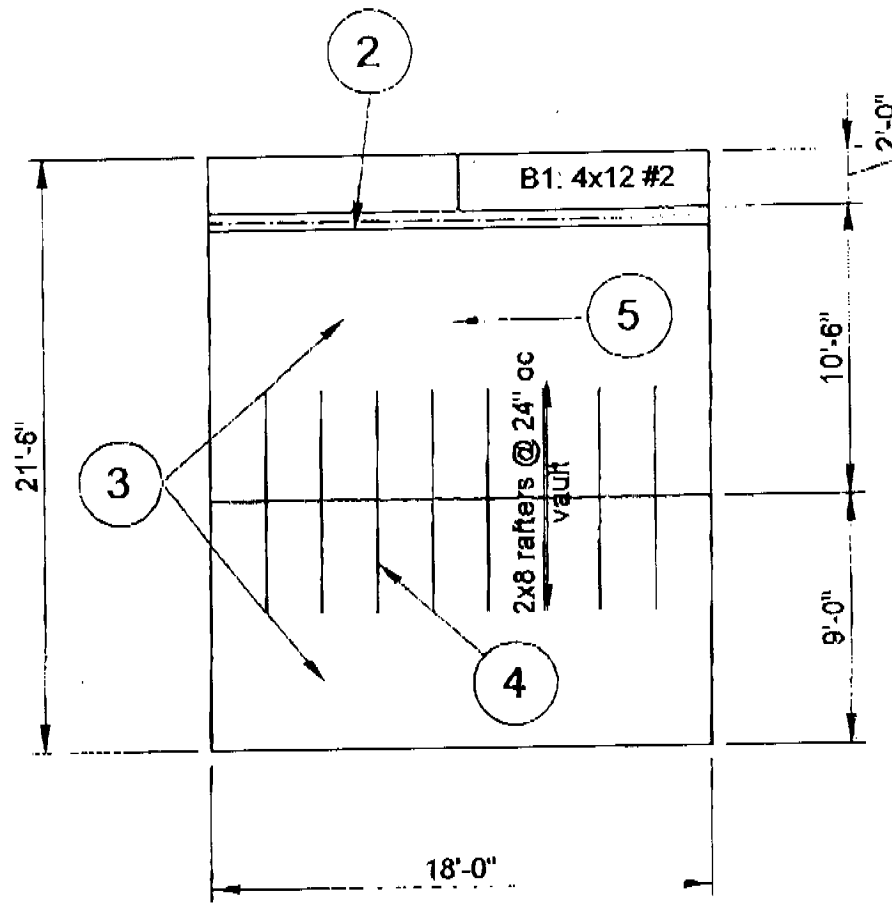
$$P = 638^{\#}$$

CAPACITY:

EXISTING 3- 3/8"  $\phi$  M.B.'s = 3 x 336<sup>#</sup> = 1008<sup>#</sup>

NEW = 12 x 0.926 x 103 = 1144<sup>#</sup>

$\therefore$  TOTAL = 1144<sup>#</sup> + 1008<sup>#</sup> > 1914<sup>#</sup>  $\therefore$  O.K.

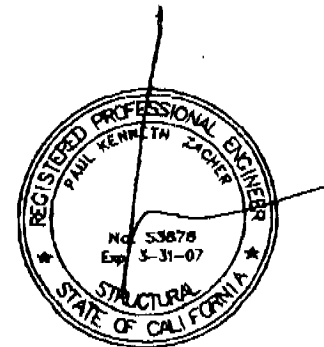


**FRAMING NOTES:**

2. Scab 3 1/4" x 11 1/4" LVL to the existing 4x12 beam. See detail 3.
3. Add 16d's @ 12" oc along length of existing 2x8 rafters to the existing 2x4 rafters.
4. Add 12 - 16d's at each end of the existing 2x8 collar ties to the existing 2x8 rafters.
5. Shim the areas as required where the existing sags occur to provide an even contour at the roof level.

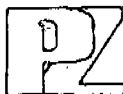
**NOTES:**

- A. This is a reroof project. The new roofing material shall be a Light Weight Concrete Tile. The tile shall weigh less than or equal to 7.3 psf.
- B. All framing members including rafters, purlins, joists and beams are existing unless otherwise noted in the framing notes above.
- C. All rafters are 2x8 DF#2 unless otherwise noted.
- D. All existing rafter, hips, valleys, rafter ties, and purlins are braced per UBC Section 2320.1 "Roof and Ceiling Framing" unless otherwise shown.
- E. All structural wood members that were observed appear to be in sound condition and without structural defect.



**2 ROOF PLAN - CROSS**  
Not to Scale: 2

Cross



Paul Zacher - Structural Engineers, Inc.  
4701 Lakeside Way  
Fair Oaks, CA 95628

TEL: (916) 961-3960  
FAX: (916) 961-6552

July 4, 2005

Cal-Vintage Roofing Co.  
11257 Coloma Road, Suite A1  
Gold River, CA 95670  
TEL: (916) 635-8320; M: 919-6698  
FAX: (916) 635-8329

Attn.: Pete Mazzuca

re: Job 2005094: Cross located at 519 Garden Street, Sacramento, CA  
subject: Amendment

The framing over the garage consists of 2x8 rafters spaced at 24" on center. The 2x8's are adequate to support the applied dead and live loads. However, the connection between the 2x8 and 2x4 rafters and the connection of the collar ties to the 2x8 rafters are inadequate. See the attached roof diagram and calculations for the recommendations.

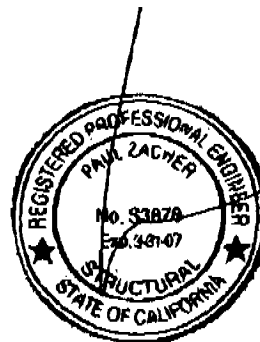
079995-ESN-6878-2005094

If you have any questions on the above, do not hesitate to call.

Sincerely,

Paul Zacher, P.E., S.E.

1/5



Paul Zacher Structural Engr's, Inc.  
4701 Lakeside Way  
Fair Oaks, CA 95628

Title :  
Dsgnr:  
Description :

Job #  
Date: 11:50AM, 4 JUL 05

Scope :

Rev: 5/20/05  
Usr: KW-0802644, Ver 5.8.0, 1-Dec-2003  
(c)1983-2003 ENERCALC Engineering Software

**Timber Beam & Joist**

Cross-sec. Calculations

Description **RAFTERS AND BEAMS**

**Timber Member Information** Code Ref: 1997/2001 NDS, 2000/2003 IBC, 2003 NFPA 5000, Base allowables are user defined

	rafter	rafter	vault	BL
Timber Section	2x4	2x6	2x8	1x12#2x1.75x11.875
Beam Width	in 1.500	1.500	1.500	6.186
Beam Depth	in 3.500	5.500	7.250	11.250
Le: Unbraced Length	ft 0.00	0.00	0.00	0.00
Timber Grade	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2
Fb - Basic Allow	psi 875.0	875.0	875.0	1,450.0
Fv - Basic Allow	psi 95.0	95.0	95.0	1,670.0
Elastic Modulus	ksi 1,600.0	1,600.0	1,600.0	1,666.7
Load Duration Factor	1.250	1.250	1.250	1.250
Member Type	Sawn	Sawn	Sawn	Manuf/Pine
Repetitive Status	Repetitive	Repetitive	Repetitive	No

**Center Span Data**

	rafter	rafter	vault	BL
Span	ft 7.75	12.00	14.00	16.00
Dead Load	#/ft 22.40	22.40	28.80	158.00
Live Load	#/ft 32.00	32.00	32.00	176.00

**Results** Ratio = 0.6482 0.9502 0.9012 0.5423

Minax @ Center	in-k	4.90	11.75	17.98	128.26
@ X =	ft	3.87	6.00	7.00	8.00
Fb : Actual	psi	1,600.4	1,553.8	1,360.3	982.9
Fb : Allowable	psi	1,886.7	1,635.2	1,509.4	1,812.5
		Bending OK	Bending OK	Bending OK	Bending OK
Fv : Actual	psi	55.9	55.1	54.0	51.1
Fv : Allowable	psi	118.8	118.8	118.8	2,087.5
		Shear OK	Shear OK	Shear OK	Shear OK

**Reactions**

@ Left End	DL	lbs	86.80	134.40	201.60	1,264.00
	LL	lbs	124.00	192.00	224.00	1,408.00
	Max. DL+LL	lbs	210.80	326.40	425.60	2,672.00
@ Right End	DL	lbs	86.80	134.40	201.60	1,264.00
	LL	lbs	124.00	192.00	224.00	1,408.00
	Max. DL+LL	lbs	210.80	326.40	425.60	2,672.00

**Deflections** Ratio OK Deflection OK Deflection OK Deflection OK

Center DL Def	in	-0.212	-0.314	-0.327	-0.190
L/Def Ratio		438.6	458.5	514.4	1,008.2
Center LL Def	in	-0.303	-0.449	-0.363	-0.212
L/Def Ratio		307.0	320.9	462.9	905.0
Center Total Def	in	-0.515	-0.763	-0.690	-0.403
Location	ft	3.875	6.000	7.000	8.000
L/Def Ratio		180.6	188.8	243.6	476.9

Aug 08 05 05:06p

Paul Zacher

(916) 961-6552

p. 5

**BOLT DESIGN: (UBC 2336)****SINGLE WOOD SIDE PLATE TO WOOD CONNECTION:****Assumptions:**

1. 2x and 4x members are Douglas-fir larch #2, 6x members are Douglas-fir larch #1.
2. Maximum bolt diameter is 1.0 inch.
3. Max angle of load to grain for side member in the connection = 0 degrees
4. Bolts in adjacent rows are not staggered.

Is loading perpendicular to grain?	Y Y or N	
Bolt diameter, D	0.375 inches	
Number of bolts in a row, n	1	A row is two or more bolts aligned with the direction of load
C-C spacing of bolts along a row	4.00 inches	Minimum spacing OK
Number of rows	1	Minimum spacing between outer rows of bolts on splice plate OK
Spacing between rows	4.00 inches	Minimum spacing between rows of bolts OK
Bending yield strength of bolt, Fyb	45,000 psi	
Thickness of side member, ts	1.50 inches	
Width of side member	7.25 inches	Minimum edge distance OK
Thickness of main member, tm	1.50 inches	
Width of main member	7.25 inches	
Load duration factor	1.00	Must be 4/3 or less for connections
Max angle of load to grain for main member in the connection	18 0 to 90 degrees	

**Allowable Bolt Design Values:**

Z', Mode Im	711 lbs/ bolt	Bearing yield failure of main member
Z', Mode Is	749 lbs/ bolt	Bearing yield failure of side plate
Z', Mode II	336 lbs/ bolt	Pivoting of the fastener w/ limited localized crushing of the wood
Z', Mode IIIa	374 lbs/ bolt	Fastener yield in bending and bearing yield of main member
Z', Mode IIIb	387 lbs/ bolt	Fastener yield in bending and bearing yield of side plate
Z', Mode IV	378 lbs/ bolt	Fastener yield in bending

**BOLT GEOMETRY FOR FULL DESIGN VALUES:**

If minimum values are not met, see UBC 2336.5 for reduced allowables

**Minimum Edge Distance (in direction of loading):**

Parallel to grain	0.563 inches
Perpendicular to Grain	
loaded edge	1.500 inches
unloaded edge	0.563 inches

**Minimum End Distance (in direction of loading):**

Parallel to grain:	Compression "	1.50 inches	Table 23-III-II
	Tension "	2.63 inches	
Perpendicular to Grain		1.500 inches	

Therefore, use 3/4" dia MB spaced @ 16" oc staggered