

CITY OF SACRAMENTO
1231 I Street, Sacramento, CA 95814

Permit No: 0511845
Insp Area: 2
Thos Bros: 336J2

Site Address: 7408 RIO MONDEGO DR SAC
Parcel No: 031-1130-066

Sub-Type: RES
Housing (Y/N): N

CONTRACTOR
ZIMMERMAN REROOFING CO.
3675 R ST
SACRAMENTO CA 95816

OWNER
HERRELL FAMILY TRUST
7408 RIO MONDEGO DR
SACRAMENTO, CA 95831

ARCHITECT

Nature of Work: T/O SHAKE, UPGRADE ROOF MEMBER STRUCTURAL CAPACITY WHERE NEEDED, R/R WITH 37 SQ EAGLITE 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.

License Class C-39 License Number 763169 Date 8-8-05 Contractor Signature Keth Or

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. 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).

PAID
CITY OF SACRAMENTO
AUG 6 8 2005
NEIGHBORHOODS, PLANNING
AND DEVELOPMENT SERVICES

I am exempt under Sec. _____ B & PC for this reason: _____
Date 8 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 above mentioned property for inspection purposes.

Date 8-8-05 Applicant/Agent Signature Keth Or

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.

KO 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 FUND Policy Number 713-0002021 Exp Date 10/01/2005

(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.

Date 8-8-05 Applicant Signature Keth Or

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.

Hill

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

TEL: 916.961.3960
FAX: 916.961.6552

RECEIVED
CITY OF SACRAMENTO
PLANNING & COMMUNITY DEVELOPMENT DEPARTMENT
1000 J STREET, SACRAMENTO, CA 95833
916-498-3000

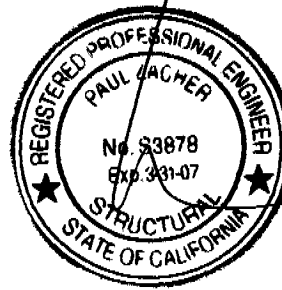
July 28, 2005

Zimmerman Roofing
3675 R Street
Sacramento, CA 95816
TEL: (916) 454-3667
FAX: (916) 691-1943

Attn.: Mr. Jeff Shulman,

re: Job 2005378: HILL

Subject: Structural Investigation Report of the Roof for the Residence located at 7408 Rio Mondego Drive, Sacramento, CA 95831.



As requested by Mr. Jeff Shulman, this is a report to determine what needs should be addressed to correct any structural deficiencies of the roof. Paul Zacher visited the site July 28, 2005. The investigation was made to determine the existing condition of the structure. All information, data and analysis contained within this report are based on the 1997 Uniform Building Code with 2001 CBC Title 24 Amendments.

The following is based on visual observations with no subsurface investigation being made.

DESCRIPTION:

Type of Facility:	Residence.
Year Built:	Estimated 1980's vintage.
Occupancy:	Residential.
No. of Stories:	One.
Dimensions:	Approximately 3000 square feet.

ISSUED
AUG 2 2005
City of Sacramento Planning Division
**IN PROGRESS
INSPECTION REQUIRED**

CONSTRUCTION:

Roof:
The roof covering will consist of a Light Weight Concrete Tile over 7/16" solid sheathing. The roof structure is framed with pre-engineered wood trusses spaced at 24" on center except for the vaulted ceiling areas. The vaulted ceiling is constructed of 2x12 rafters spaced at 24" on center.

CONCLUSIONS:

Roof:
The roof structure currently lacks sufficient structural capacity for the applied live and dead loads. See "Recommendations" for location and repair to bring the roof structure up to the required capacity.

CITY COPY

1/27

0511845

Hill



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. Add 2x6 out lookers spaced at 4'-0" on center. See details 1 and 2.
2. Scab a 2x4 DF#2 x 10'-0" long rafter to the top chord of the existing truss. See details 1 and 3.

It shall be noted that small hairline cracking may occur at exterior stucco and interior gypboard 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.
file

DESIGN LOADING:

Roof Pitch	6	in 12
Pitch Adjustment Factor	1.12	

LOCATION: VAULT

<u>MATERIAL</u>		<u>WEIGHT</u>	
Light Weight Tile		7.30	psf
Roofing felt		0.30	psf
1x4 skip sht'g		1.09	psf
7/16" OSB/ plywood		1.30	psf
2x12 rafters @ 24" oc		2.05	psf
Batt/blown insul		0.50	psf
1/2" Gypboard		2.50	psf
	Load	15.0	psf
	Roof Pitch Adjustment	1.78	psf
	Total Load	16.8	psf

The dead and live load on truss top chord is placed along the length of the top chord. Therefore, the live load is as follows:

Live Load on top chord	14.3
------------------------	------

LOCATION: TOP CHORD

<u>MATERIAL</u>		<u>WEIGHT</u>	
Light Weight Tile		7.30	psf
Roofing felt		0.30	psf
7/16" OSB/ plywood		1.30	psf
1x4 skip sht'g		1.09	psf
2x4 truss @ 24" oc		0.64	psf
	Total Load	10.6	psf

LOCATION: BOTTOM CHORD

<u>MATERIAL</u>		<u>WEIGHT</u>	
Batt/blown insul		0.50	psf
2x4 truss @ 24" oc		1.28	psf
1/2" Gypboard		2.50	psf
	Load	4.3	psf

PAUL ZACHER- STRUCTURAL ENGINEERS, INC.

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

Job #: 05_378

Date: 07/28/2004

LOADING:

Vault:

Dr = 16.8 psf x 2'-0" = 33.6 plf
Lr = 16.0 psf x 2'-0" = 32.0 plf

2x12 #2

31.8 / 32.0

20'-0"

B2:

Dr = 14.9 psf x 7'-0" = 104 plf
Lr = 16.0 psf x 7'-0" = 112 plf

4x14 #2

104 / 112

16'-0"

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

Title :
 Dsgnr:
 Description :

Job #
 Date: 5:33PM, 28 JUL 05

Scope :

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

Timber Beam & Joist

Hill,ew:Calculations

Description RAFTERS AND BEAMS

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

		vault	B1
Timber Section		2x12	4x14
Beam Width	in	1.500	3.500
Beam Depth	in	11.250	13.250
Le: Unbraced Length	ft	0.00	0.00
Timber Grade		Douglas Fir - Larch, No.2	Douglas Fir - Larch, No.2
Fb - Basic Allow	psi	875.0	875.0
Fv - Basic Allow	psi	95.0	95.0
Elastic Modulus	ksi	1,600.0	1,600.0
Load Duration Factor		1.250	1.250
Member Type		Sawn	Sawn
Repetitive Status		Repetitive	No

Center Span Data

		vault	B1
Span	ft	20.00	16.00
Dead Load	#/ft	33.60	104.00
Live Load	#/ft	32.00	112.00

Results

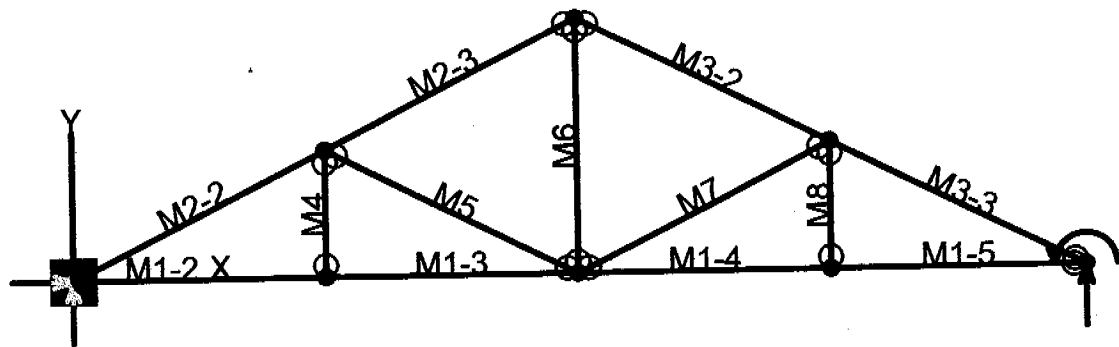
	Ratio =	vault	B1
Mmax @ Center	in-k	39.36	82.94
@ X =	ft	10.00	8.00
fb : Actual	psi	1,244.0	809.9
Fb : Allowable	psi	1,257.8	1,093.8
		Bending OK	Bending OK
fv : Actual	psi	53.2	48.3
Fv : Allowable	psi	118.8	118.8
		Shear OK	Shear OK

Reactions

		vault	B1
@ Left End	DL	336.00	832.00
	LL	320.00	896.00
	Max. DL+LL	656.00	1,728.00
@ Right End	DL	336.00	832.00
	LL	320.00	896.00
	Max. DL+LL	656.00	1,728.00

Deflections

		vault	B1
Center DL Defl	in	-0.425	-0.141
L/Defl Ratio		565.0	1,359.2
Center LL Defl	in	-0.405	-0.152
L/Defl Ratio		593.3	1,262.1
Center Total Defl	in	-0.829	-0.293
Location	ft	10.000	8.000
L/Defl Ratio		289.4	654.4



Truss 1

VisualAnalysis 4.00 Report

Company: Paul Zacher - Structural - Engineers Engineer: Paul Zacher
File: C:\Documents and Settings\Owner\Desktop\Hill105_378\Truss 1.vap

Nodes

Node	X ft	Y ft	Fix	DX	DY	RZ
N1	0.00	0.00	Yes	Yes	No	No
N2	30.00	0.00	No	"	Yes	Yes
N3	15.00	7.50	"	No	No	No
N4	7.50	0.00	"	"	"	"
N5	15.00	0.00	"	"	"	"
N6	22.50	0.00	"	"	"	"
N7	7.50	3.75	"	"	"	"
N8	22.50	3.75	"	"	"	"

Member Elements

Member	Section	Material	Length ft
M1-2	SS2x4	Wood	7.50
M1-3	"	"	7.50
M1-4	"	"	7.50
M1-5	"	"	7.50
M2-2	"	"	8.39
M2-3	"	"	8.39
M3-2	"	"	8.39
M3-3	"	"	8.39
M4	"	"	3.75
M5	"	"	8.39
M6	"	"	7.50
M7	"	"	8.39
M8	"	"	3.75

Section Properties

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

Material Properties

Material	Strength psi	Elasticity psi	Poisson	Density lb/ft ³
Wood	-NA-	1700000.00	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	852.00	-NA-
N2	"	-NA-	852.00	0.00

Member Results

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M1-2	1373.96	-36.91	-34.95	0.01	-0.12
"	1373.96	-15.41	30.43	0.01	-0.11
"	1373.96	6.09	42.08	0.00	-0.08
"	1373.96	27.59	0.00	0.00	0.00
M1-3	1373.96	-33.04	-40.85	0.03	-0.12
"	1373.96	-11.54	14.85	0.02	-0.13
"	1373.96	9.96	16.82	0.02	-0.13
"	1373.96	31.46	-34.95	0.01	-0.12
M1-4	1373.96	-31.46	-34.95	0.04	-0.12
"	1373.96	-9.96	16.82	0.04	-0.13
"	1373.96	11.54	14.85	0.03	-0.13
"	1373.96	33.04	-40.85	0.03	-0.12
M1-5	1373.96	-27.59	0.00	0.06	0.00
"	1373.96	-6.09	42.08	0.05	-0.08
"	1373.96	15.41	30.43	0.05	-0.11
"	1373.96	36.91	-34.95	0.04	-0.12
M2-2	-1597.5	122.92	0.00	0.00	0.00
"	-1543.7	15.14	192.83	-0.01	-0.24
"	-1489.8	-92.64	84.53	-0.01	-0.22
"	-1435.9	-200.41	-324.90	-0.02	-0.12
M2-3	-1058.8	200.41	-324.90	-0.02	-0.12
"	-1004.9	92.64	84.53	-0.02	-0.26
"	-951.08	-15.14	192.83	-0.02	-0.31
"	-897.19	-122.92	0.00	-0.03	-0.12
M3-2	-1058.8	-200.41	-324.90	0.07	-0.10
"	-1004.9	-92.64	84.53	0.07	-0.24
"	-951.08	15.14	192.83	0.07	-0.29
"	-897.19	122.92	0.00	0.08	-0.09
M3-3	-1597.5	-122.92	0.00	0.05	0.02
"	-1543.7	-15.14	192.83	0.06	-0.21
"	-1489.8	92.64	84.53	0.06	-0.20
"	-1435.9	200.41	-324.90	0.07	-0.10
M4	68.37	0.00	0.00	0.12	0.01
"	68.37	0.00	0.00	0.12	0.02
"	68.37	0.00	0.00	0.12	0.03
"	68.37	0.00	0.00	0.12	0.04
M5	-577.48	0.00	0.00	0.08	-0.10
"	-577.48	0.00	0.00	0.08	-0.09
"	-577.48	0.00	0.00	0.08	-0.09
"	-577.48	0.00	0.00	0.09	-0.09
M6	582.59	0.00	0.00	-0.12	-0.03
"	582.59	0.00	0.00	-0.12	-0.03
"	582.59	0.00	0.00	-0.12	-0.03
"	582.59	0.00	0.00	-0.12	-0.03
M7	-577.48	0.00	0.00	-0.04	-0.12
"	-577.48	0.00	0.00	-0.04	-0.11
"	-577.48	0.00	0.00	-0.03	-0.12
"	-577.48	0.00	0.00	-0.03	-0.12
M8	68.37	0.00	0.00	0.12	0.02
"	68.37	0.00	0.00	0.12	0.02
"	68.37	0.00	0.00	0.12	0.03
"	68.37	0.00	0.00	0.12	0.04

BENDING & COMP: TRUSS 1 - MEMBER 2-2

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

Grading:

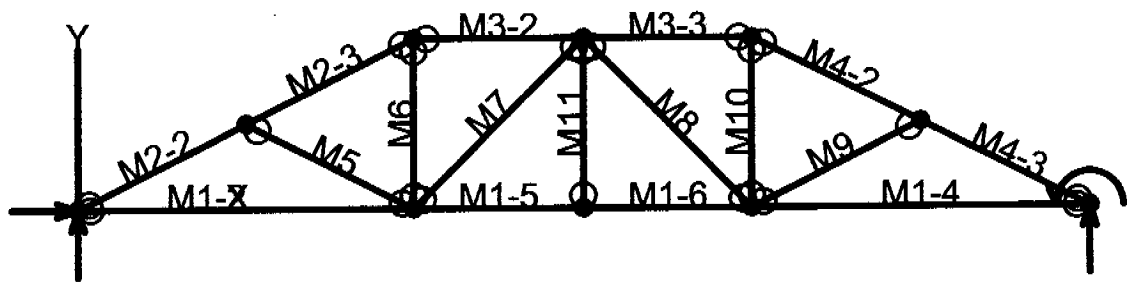
2x or 4x

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	3 inches
Depth, d	3.5 inches
Length	8.39 feet
Max Axial Comp, C	1439 lbs
Max Reaction, R	200 lbs
Max Moment, M	324 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 =	1.23
fc =	137 psi
Fce =	759 psi
Fc* =	2084 psi
F'c =	690 psi
fb =	635 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.24 < 1.0, Member OK
Interaction equation:	
(fc/F'c) ² +	
fb / (F'b(1-fc/Fce)) =	0.40 < 1.0, Member OK
Live Load defl ratio	0.14 < 1.0, Member OK
Total Load defl ratio	0.21 < 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\Hill105_378\Truss 2.vap

Nodes

Node	X ft	Y ft	Fix DX	Fix DY	Fix RZ
N1	0.00	0.00	Yes	Yes	No
N2	30.00	0.00	No	"	Yes
N3	10.00	5.00	"	No	No
N4	20.00	5.00	"	"	"
N5	10.00	0.00	"	"	"
N6	20.00	0.00	"	"	"
N7	5.00	2.50	"	"	"
N8	15.00	5.00	"	"	"
N9	25.00	2.50	"	"	"
N10	15.00	0.00	"	"	"

Member Elements

Member	Section	Material	Length ft
M1-2	SS2x4	Wood	10.00
M1-4	"	"	10.00
M1-5	"	"	5.00
M1-6	"	"	5.00
M2-2	"	"	5.59
M2-3	"	"	5.59
M3-2	"	"	5.00
M3-3	"	"	5.00
M4-2	"	"	5.59
M4-3	"	"	5.59
M5	"	"	5.59
M6	"	"	5.00
M7	"	"	7.07
M8	"	"	7.07
M9	"	"	5.59
M10	"	"	5.00
M11	"	"	5.00

Section Properties

Category	Section	Ax in ²	Ix in ⁴	Sy+ in ³	Sy- in ³
Wood	Sha SS2x4	5.25	5.36	3.06	3.06

Material Properties

Material	Strength psi	Elasticity psi	Poisson	Density lb/ft ³
Wood	-NA-	1700000.00	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	852.00	-NA-
N2	"	-NA-	852.00	0.00

Member Results

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M1-2	1443.59	-50.29	-72.94	0.02	-0.12
"	1443.59	-21.63	46.89	0.01	-0.18
"	1443.59	7.04	71.20	0.01	-0.16
"	1443.59	35.71	0.00	0.00	0.00
M1-4	1443.59	-35.71	0.00	0.06	0.00
"	1443.59	-7.04	71.20	0.05	-0.16
"	1443.59	21.63	46.89	0.04	-0.18
"	1443.59	50.29	-72.94	0.04	-0.12
M1-5	1302.92	-3.51	17.00	0.03	-0.13
"	1302.92	10.82	10.90	0.03	-0.13
"	1302.92	25.15	-19.08	0.02	-0.12
"	1302.92	39.49	-72.94	0.02	-0.12
M1-6	1302.92	-39.49	-72.94	0.04	-0.12
"	1302.92	-25.15	-19.08	0.03	-0.12
"	1302.92	-10.82	10.90	0.03	-0.13
"	1302.92	3.51	17.00	0.03	-0.13
M2-2	-1656.2	84.52	0.00	0.00	0.00
"	-1620.3	12.67	90.50	-0.00	-0.08
"	-1584.3	-59.18	47.16	-0.01	-0.10
"	-1548.4	-131.04	-130.01	-0.01	-0.10
M2-3	-1351.9	131.04	-130.01	-0.01	-0.10
"	-1315.9	59.18	47.16	-0.02	-0.14
"	-1280.0	-12.67	90.50	-0.02	-0.16
"	-1244.1	-84.52	0.00	-0.02	-0.12
M3-2	-1150.5	-148.82	-141.60	0.03	-0.13
"	-1150.5	-68.49	39.44	0.03	-0.15
"	-1150.5	11.85	86.64	0.03	-0.16
"	-1150.5	92.18	0.00	0.04	-0.12
M3-3	-1150.5	-92.18	0.00	0.02	-0.12
"	-1150.5	-11.85	86.64	0.02	-0.16
"	-1150.5	68.49	39.44	0.03	-0.15
"	-1150.5	148.82	-141.60	0.03	-0.13
M4-2	-1351.9	-131.04	-130.01	0.06	-0.08
"	-1315.9	-59.18	47.16	0.07	-0.12
"	-1280.0	12.67	90.50	0.07	-0.13
"	-1244.1	84.52	0.00	0.07	-0.10
M4-3	-1656.2	-84.52	0.00	0.05	0.03
"	-1620.3	-12.67	90.50	0.05	-0.05
"	-1584.3	59.18	47.16	0.06	-0.08
"	-1548.4	131.04	-130.01	0.06	-0.08
M5	-327.59	0.00	0.00	0.07	-0.10
"	-327.59	0.00	0.00	0.07	-0.09
"	-327.59	0.00	0.00	0.07	-0.08
"	-327.59	0.00	0.00	0.07	-0.07
M6	388.62	0.00	0.00	-0.12	-0.04
"	388.62	0.00	0.00	-0.12	-0.03
"	388.62	0.00	0.00	-0.12	-0.02
"	388.62	0.00	0.00	-0.12	-0.02

12

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M7	-215.43	0.00	0.00	-0.08	-0.12
"	-215.43	0.00	0.00	-0.07	-0.11
"	-215.43	0.00	0.00	-0.07	-0.11
"	-215.43	0.00	0.00	-0.07	-0.10
M8	-215.43	0.00	0.00	0.11	-0.07
"	-215.43	0.00	0.00	0.11	-0.07
"	-215.43	0.00	0.00	0.11	-0.06
"	-215.43	0.00	0.00	0.12	-0.08
M9	-327.59	0.00	0.00	-0.02	-0.13
"	-327.59	0.00	0.00	-0.02	-0.12
"	-327.59	0.00	0.00	-0.02	-0.11
"	-327.59	0.00	0.00	-0.02	-0.10
M10	388.62	0.00	0.00	-0.12	-0.04
"	388.62	0.00	0.00	-0.12	-0.03
"	388.62	0.00	0.00	-0.12	-0.03
"	388.62	0.00	0.00	-0.12	-0.02
M11	7.03	0.00	0.00	0.13	0.03
"	7.03	0.00	0.00	0.13	0.03
"	7.03	0.00	0.00	0.13	0.03
"	7.03	0.00	0.00	0.13	0.03

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	5.59 feet
Max Axial Comp, C	1548 lbs
Max Reaction, R	131 lbs
Max Moment, M	130 ft-lbs
Max LL Deflection	0.05 inches
Max TL Deflection	0.10 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 =	1.15
fc =	295 psi
Fce =	1602 psi
Fc* =	2084 psi
F'c =	1239 psi
fb =	509 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.32 < 1.0, Member OK
Interaction equation:	
(fc/F'c) ² +	
fb / (F'b(1-fc/Fce)) =	0.35 < 1.0, Member OK
Live Load defl ratio	0.18 < 1.0, Member OK
Total Load defl ratio	0.27 < 1.0, Member OK

Truss 3

VisualAnalysis 4.00 Report

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

File: C:\Documents and Settings\Owner\Desktop\Hill05_378\Truss 3.vap

Nodes

Node	X ft	Y ft	Fix DX	Fix DY	Fix RZ
N1	0.00	0.00	Yes	Yes	No
N2	16.00	8.00	No	No	"
N3	16.00	4.00	"	"	"
N4	16.00	0.00	"	Yes	Yes
N5	21.00	10.50	"	No	No
N6	21.00	0.00	"	"	"
N7	39.00	1.50	"	"	"
N8	39.00	0.00	"	Yes	Yes
N9	5.33	1.33	"	No	No
N10	10.67	2.67	"	"	"
N11	27.00	0.00	"	"	"
N12	33.00	0.00	"	"	"
N13	27.00	7.50	"	"	"
N14	33.00	4.50	"	"	"
N15	4.00	2.00	"	"	"
N16	8.00	4.00	"	"	"
N17	12.00	6.00	"	"	"

Member Elements

Member	Section	Material	Length ft
M1-2	SS2x4	Wood	5.50
M1-3	"	"	5.50
M1-4	"	"	5.50
M2	"	"	5.00
M3-2	"	"	6.00
M3-3	"	"	6.00
M3-4	"	"	6.00
M4-2	"	"	4.47
M4-3	"	"	4.47
M4-4	"	"	4.47
M4-5	"	"	4.47
M5	"	"	5.59
M6-2	"	"	6.71
M6-3	"	"	6.71
M6-4	"	"	6.71
M7	"	"	4.00
M8	"	"	4.00
M9	"	"	8.20
M10	"	"	6.40
M11	"	"	10.50
M12	"	"	4.47
M13	"	"	3.59
M14	"	"	2.98
M15	"	"	3.77
M16	"	"	1.49
M17	"	"	9.60
M18	"	"	7.50
M19	"	"	7.50
M20	"	"	4.50
M21	"	"	7.50
M22	"	"	1.50

Member	Section	Material	Length ft
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Section Properties

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

Material Properties

Material	Strength psi	Elasticity psi	Poisson	Density lb/ft ³
Wood	-NA-	1700000.00	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	312.49	-NA-
N4	"	-NA-	1348.22	0.00
N8	"	-NA-	554.48	0.00

Member Results

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M1-2	844.11	22.05	0.00	0.00	0.00
"	847.81	7.22	26.80	0.00	-0.04
"	851.52	-7.62	26.44	0.00	-0.06
"	855.23	-22.45	-1.10	0.01	-0.06
M1-3	373.56	17.29	-1.10	0.01	-0.06
"	377.27	2.46	16.99	0.01	-0.06
"	380.98	-12.37	7.90	0.01	-0.05
"	384.69	-27.21	-28.35	0.01	-0.04
M1-4	-107.19	27.41	-28.35	0.01	-0.04
"	-103.48	12.57	8.27	0.01	-0.04
"	-99.77	-2.26	17.72	0.01	-0.03
"	-96.06	-17.09	0.00	0.01	-0.01
M2	-3.10	-26.03	-22.67	-0.00	-0.02
"	-3.10	-11.70	8.77	-0.00	-0.02
"	-3.10	2.63	16.32	-0.00	-0.01
"	-3.10	16.97	0.00	-0.00	0.00
M3-2	367.99	-25.93	-23.43	0.00	-0.03
"	367.99	-8.73	11.21	0.00	-0.04
"	367.99	8.47	11.46	-0.00	-0.03
"	367.99	25.67	-22.67	-0.00	-0.02
M3-3	555.31	-26.34	-26.64	0.01	-0.03

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
"	555.31	-9.14	8.82	0.00	-0.04
"	555.31	8.06	9.89	0.00	-0.04
"	555.31	25.26	-23.43	0.00	-0.03
M3-4	555.31	-21.36	0.00	0.01	0.00
"	555.31	-4.16	25.51	0.01	-0.03
"	555.31	13.04	16.62	0.01	-0.03
"	555.31	30.24	-26.64	0.01	-0.03
M4-2	-958.97	74.87	0.00	0.00	0.00
"	-930.23	17.39	68.73	-0.00	-0.04
"	-901.49	-40.10	51.80	-0.00	-0.06
"	-872.75	-97.58	-50.78	-0.01	-0.06
M4-3	-737.57	82.66	-50.78	-0.01	-0.06
"	-708.83	25.18	29.57	-0.01	-0.07
"	-680.09	-32.30	24.26	-0.01	-0.06
"	-651.35	-89.78	-66.70	-0.01	-0.05
M4-4	-86.88	90.11	-66.70	-0.01	-0.05
"	-58.14	32.63	24.75	-0.01	-0.05
"	-29.40	-24.85	30.55	-0.01	-0.04
"	-0.66	-82.33	-49.31	-0.01	-0.03
M4-5	564.78	68.97	-49.31	-0.01	-0.03
"	593.53	11.49	10.62	-0.01	-0.02
"	622.27	-45.99	-15.10	-0.01	-0.01
"	651.01	-103.48	-126.47	-0.01	-0.01
M5	530.60	130.40	-126.47	-0.01	-0.01
"	566.52	58.55	49.52	-0.00	-0.05
"	602.45	-13.30	91.68	-0.00	-0.06
"	638.38	-85.15	0.00	-0.00	-0.02
M6-2	-162.88	-155.02	-172.29	0.01	-0.03
"	-119.77	-68.79	77.86	0.01	-0.10
"	-76.66	17.43	135.29	0.01	-0.11
"	-33.55	103.65	0.00	0.01	-0.01
M6-3	-475.75	-128.66	-167.75	0.01	-0.03
"	-432.64	-42.43	23.46	0.01	-0.04
"	-389.53	43.79	21.95	0.01	-0.04
"	-346.42	130.01	-172.29	0.01	-0.03
M6-4	-52.16	-104.33	0.00	0.01	0.00
"	-9.05	-18.11	136.81	0.01	-0.10
"	34.06	68.12	80.89	0.01	-0.10
"	77.17	154.34	-167.75	0.01	-0.03
M7	-263.04	-3.10	0.00	-0.01	0.00
"	-263.04	-3.10	4.14	-0.01	-0.00
"	-263.04	-3.10	8.28	-0.01	-0.01
"	-263.04	-3.10	12.41	-0.01	-0.01
M8	-1331.2	3.10	-12.41	0.01	0.01
"	-1331.2	3.10	-8.28	0.00	0.01
"	-1331.2	3.10	-4.14	0.00	0.00
"	-1331.2	3.10	0.00	0.00	-0.00
M9	-999.26	0.00	0.00	-0.00	0.01
"	-999.26	0.00	0.00	0.00	0.01
"	-999.26	0.00	0.00	0.01	0.02
"	-999.26	0.00	0.00	0.01	0.02
M10	101.76	0.00	0.00	0.01	-0.02
"	101.76	0.00	0.00	0.01	-0.01
"	101.76	0.00	0.00	0.01	-0.01
"	101.76	0.00	0.00	0.01	0.00
M11	352.68	0.00	0.00	-0.02	-0.01
"	352.68	0.00	0.00	-0.02	-0.00
"	352.68	0.00	0.00	-0.02	-0.00
"	352.68	0.00	0.00	-0.02	0.00
M12	-490.44	0.00	0.00	-0.02	0.02
"	-490.44	0.00	0.00	-0.01	0.00
"	-490.44	0.00	0.00	-0.01	0.01
"	-490.44	0.00	0.00	-0.01	0.02
M13	362.82	0.00	0.00	0.03	0.01

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
"	362.82	0.00	0.00	0.03	0.02
"	362.82	0.00	0.00	0.03	0.02
"	362.82	0.00	0.00	0.03	0.03
M14	-368.05	0.00	0.00	-0.03	0.02
"	-368.05	0.00	0.00	-0.03	0.03
"	-368.05	0.00	0.00	-0.03	0.03
"	-368.05	0.00	0.00	-0.03	0.04
M15	362.23	0.00	0.00	0.03	0.04
"	362.23	0.00	0.00	0.03	0.05
"	362.23	0.00	0.00	0.03	0.05
"	362.23	0.00	0.00	0.03	0.06
M16	-225.30	0.00	0.00	-0.05	0.04
"	-225.30	0.00	0.00	-0.05	0.04
"	-225.30	0.00	0.00	-0.05	0.04
"	-225.30	0.00	0.00	-0.05	0.04
M17	-466.83	0.00	0.00	-0.03	-0.02
"	-466.83	0.00	0.00	-0.02	-0.02
"	-466.83	0.00	0.00	-0.02	-0.02
"	-466.83	0.00	0.00	-0.02	-0.01
M18	191.68	0.00	0.00	0.03	-0.00
"	191.68	0.00	0.00	0.03	0.00
"	191.68	0.00	0.00	0.03	0.00
"	191.68	0.00	0.00	0.03	0.00
M19	-234.15	0.00	0.00	-0.02	-0.03
"	-234.15	0.00	0.00	-0.02	-0.03
"	-234.15	0.00	0.00	-0.02	-0.02
"	-234.15	0.00	0.00	-0.02	-0.02
M20	56.58	0.00	0.00	0.03	-0.00
"	56.58	0.00	0.00	0.03	-0.00
"	56.58	0.00	0.00	0.03	0.00
"	56.58	0.00	0.00	0.03	0.01
M21	-694.14	0.00	0.00	0.01	-0.02
"	-694.14	0.00	0.00	0.01	-0.00
"	-694.14	0.00	0.00	0.01	0.01
"	-694.14	0.00	0.00	0.02	-0.03
M22	-116.64	0.00	0.00	-0.00	-0.01
"	-116.64	0.00	0.00	-0.00	-0.01
"	-116.64	0.00	0.00	-0.00	-0.01
"	-116.64	0.00	0.00	0.00	-0.01

BENDING & COMP: TRUSS 3 - MEMBER 4-2

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

Grading:

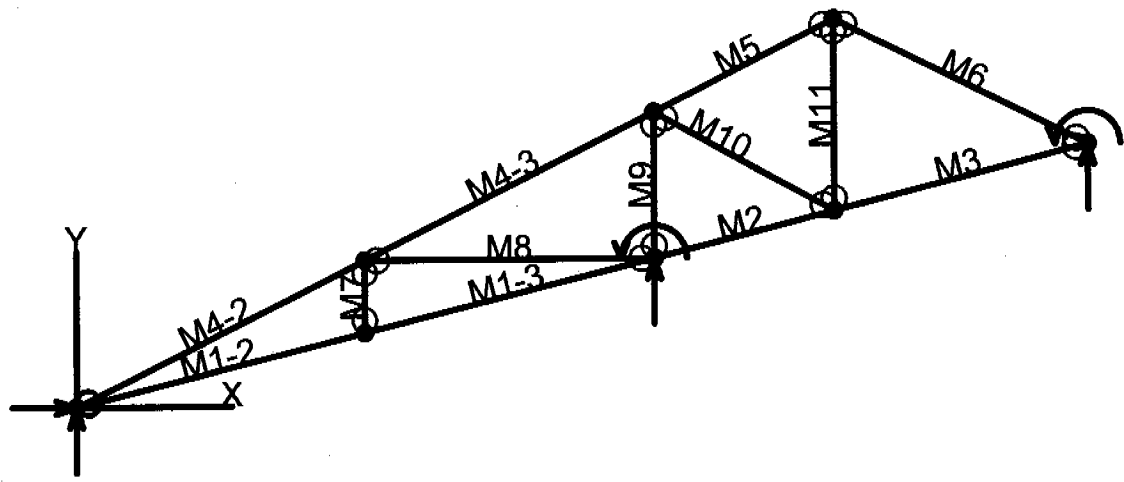
2x or 4x

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	4.47 feet
Max Axial Comp, C	872 lbs
Max Reaction, R	97 lbs
Max Moment, M	51 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 =	1.12
fc =	166 psi
Fce=	2438 psi
Fc* =	2084 psi
F'c=	1547 psi
fb=	200 psi
F'b=Fb* =	2156 psi
Shear D/C ratio	0.23 < 1.0, Member OK
Interaction equation: (fc/F'c)^2 +	
fb/ (F'b(1-fc/Fce)) =	0.11 < 1.0, Member OK
Live Load defl ratio	0.13 < 1.0, Member OK
Total Load defl ratio	0.20 < 1.0, Member OK



Truss 4

VisualAnalysis 4.00 Report

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

File: C:\Documents and Settings\Owner\Desktop\Hill05_378\Truss 4.vap

Nodes

Node	X ft	Y ft	Fix DX	Fix DY	Fix RZ
N1	0.00	0.00	Yes	Yes	No
N2	16.00	8.00	No	No	"
N3	16.00	4.00	"	Yes	Yes
N4	21.00	10.50	"	No	No
N5	21.00	5.25	"	"	"
N6	28.00	7.00	"	Yes	Yes
N7	8.00	2.00	"	No	No
N8	8.00	4.00	"	"	"

Member Elements

Member	Section	Material	Length ft
M1-2	SS2x4	Wood	8.25
M1-3	"	"	8.25
M2	"	"	5.15
M3	"	"	7.22
M4-2	"	"	8.94
M4-3	"	"	8.94
M5	"	"	5.59
M6	"	"	7.83
M7	"	"	2.00
M8	"	"	8.00
M9	"	"	4.00
M10	"	"	5.71
M11	"	"	5.25

Section Properties

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

Material Properties

Material	Strength psi	Elasticity psi	Poisson	Density lb/ft ³
Wood	-NA-	1700000.00	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	305.21	-NA-
N3	"	-NA-	1138.73	-54.94
N6	"	-NA-	146.46	0.00

Member Results

Member	Fx lb	Vy lb	Mz lb-ft	Dx in	Dy in
M1-2	500.73	28.69	0.00	0.00	0.00
"	506.30	6.44	48.27	0.00	-0.08
"	511.86	-15.80	35.41	0.00	-0.09
"	517.42	-38.05	-38.59	0.01	-0.06
M1-3	500.32	30.35	-38.59	0.01	-0.06
"	505.88	8.10	14.24	0.01	-0.05
"	511.44	-14.15	5.93	0.01	-0.03
"	517.01	-36.40	-63.51	0.01	-0.00
M2	-550.13	14.94	-8.57	0.01	-0.00
"	-546.66	1.04	5.14	0.01	-0.00
"	-543.18	-12.87	-5.02	0.01	-0.00
"	-539.70	-26.77	-39.06	0.01	-0.00
M3	-72.92	34.62	-39.06	0.01	-0.00
"	-68.05	15.15	20.76	0.01	-0.03
"	-63.18	-4.32	33.78	0.01	-0.03
"	-58.32	-23.79	0.00	0.01	-0.00
M4-2	-619.08	136.36	0.00	0.00	0.00
"	-561.60	21.39	235.02	-0.00	-0.31
"	-504.12	-93.57	127.42	-0.00	-0.27
"	-446.64	-208.54	-322.80	-0.01	-0.06
M4-3	499.74	185.82	-322.80	-0.01	-0.06
"	557.22	70.86	59.70	-0.00	-0.12
"	614.70	-44.11	99.58	-0.00	-0.12
"	672.19	-159.07	-203.15	0.00	-0.01
M5	-2.36	144.12	-203.15	0.00	-0.01
"	33.57	72.27	-1.60	0.00	-0.01
"	69.50	0.41	66.12	0.00	-0.03
"	105.42	-71.44	0.00	0.00	-0.01
M6	-5.74	-150.89	0.00	0.01	0.00
"	44.55	-50.30	262.32	0.01	-0.31
"	94.85	50.30	262.32	0.01	-0.31
"	145.15	150.89	0.00	0.01	-0.00
M7	70.51	0.00	0.00	-0.06	-0.02
"	70.51	0.00	0.00	-0.06	-0.02
"	70.51	0.00	0.00	-0.06	-0.02
"	70.51	0.00	0.00	-0.06	-0.02
M8	-1022.8	0.00	0.00	0.01	0.00
"	-1022.8	0.00	0.00	0.02	-0.06
"	-1022.8	0.00	0.00	0.02	-0.04
"	-1022.8	0.00	0.00	0.02	-0.02
M9	-830.10	0.00	0.00	-0.00	-0.01
"	-830.10	0.00	0.00	-0.00	-0.01
"	-830.10	0.00	0.00	0.00	-0.01
"	-830.10	0.00	0.00	-0.00	-0.00
M10	533.82	0.00	0.00	0.00	-0.00
"	533.82	0.00	0.00	0.01	-0.00
"	533.82	0.00	0.00	0.01	0.00
"	533.82	0.00	0.00	0.01	0.00
M11	-310.91	0.00	0.00	-0.01	-0.00
"	-310.91	0.00	0.00	-0.00	-0.01
"	-310.91	0.00	0.00	-0.00	-0.01
"	-310.91	0.00	0.00	-0.00	-0.01

BENDING & COMP: TRUSS 4 - MEMBER 4-2

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

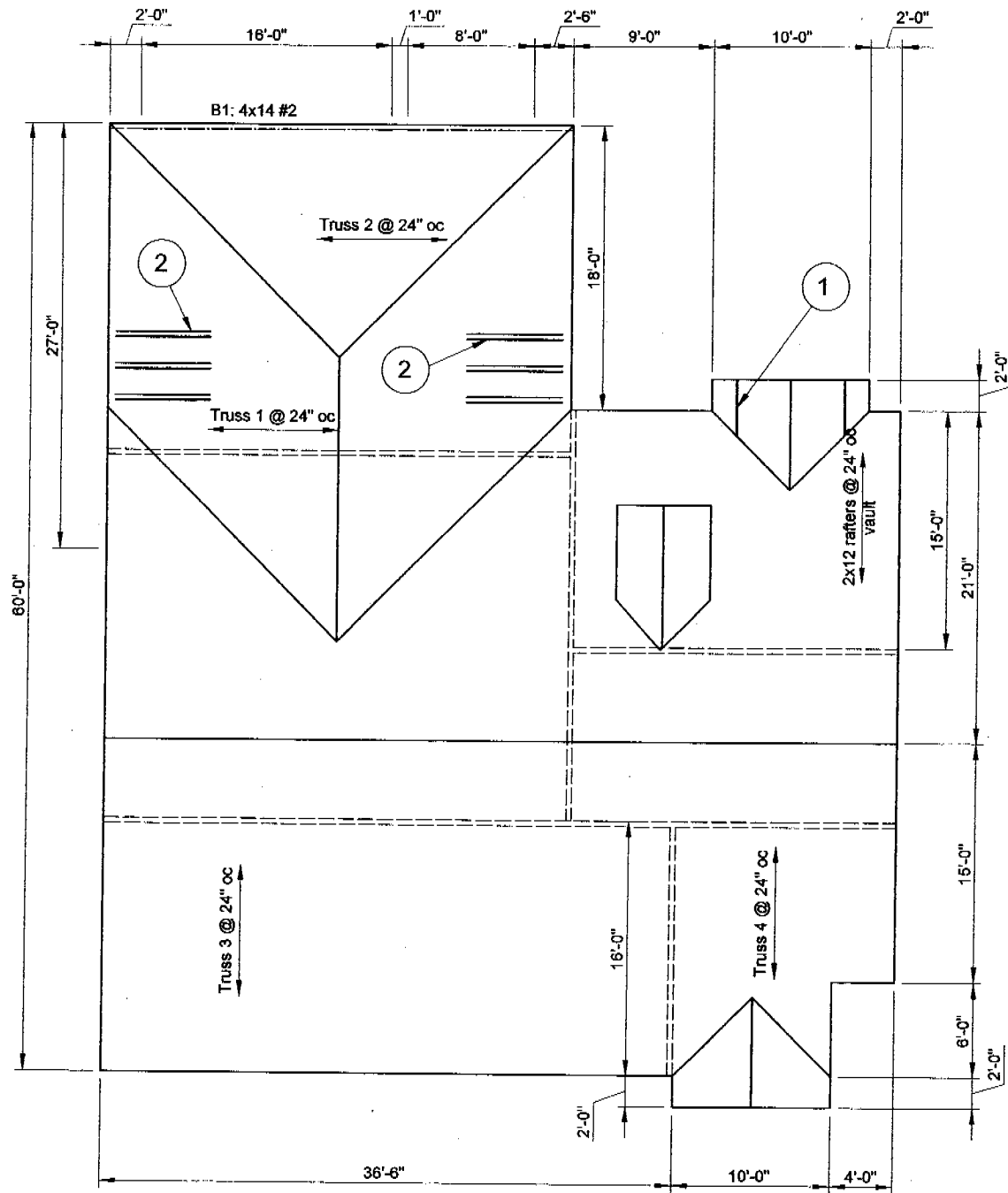
Grading:

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	8.94 feet
Max Axial Comp, C	446 lbs
Max Reaction, R	208 lbs
Max Moment, M	322 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 =	1.25
fc =	85 psi
Fce =	676 psi
Fc* =	2084 psi
F'c =	623 psi
fb =	1262 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.50 < 1.0, Member OK
Interaction equation:	
(fc/F'c) ² +	
fb / (F'b(1-fc/Fce)) =	0.69 < 1.0, Member OK
Live Load defl ratio	0.07 < 1.0, Member OK
Total Load defl ratio	0.10 < 1.0, Member OK



FRAMING NOTES:

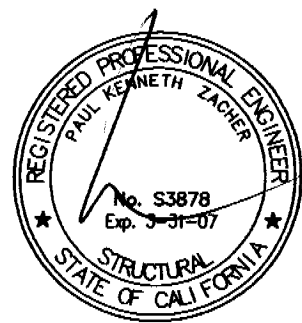
1. Add a 2x6 outlooker @ 4'-0" on center (total 2). See detail 2.
2. Scab a 2x4 DF#2 x 10'-0" long rafter to the top chord of the existing truss #1 (total 6). See detail 3.

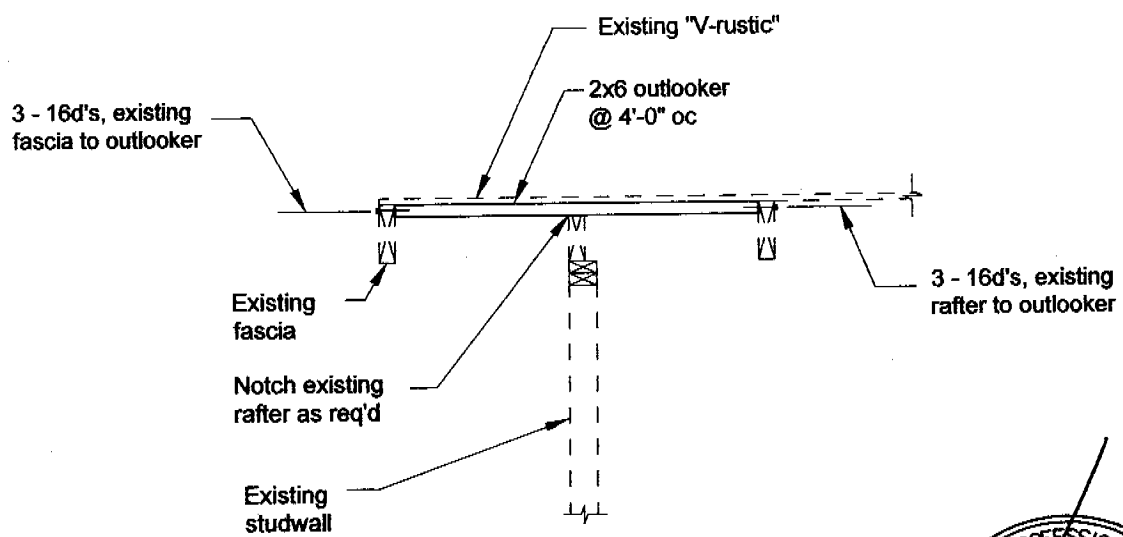
NOTES:

- 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 structural wood members that were observed appear to be in sound condition and without structural defect.

1 ROOF PLAN - HILL
Not to Scale

25

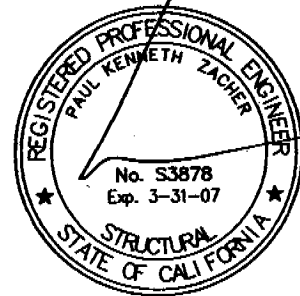


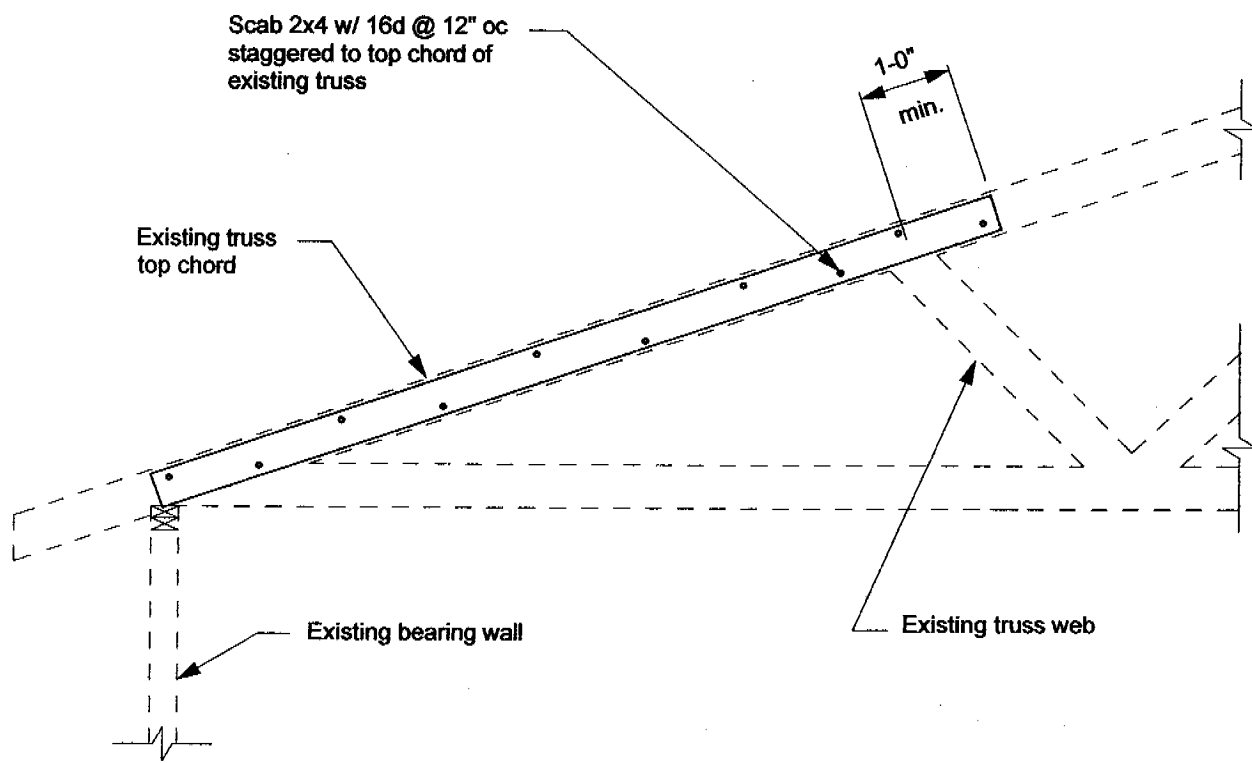


2

SHEAR TRANSFER DETAIL

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





3

TRUSS REINFORCEMENT DETAIL

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

27

