

011249

Antonio

TEL: 916.961.3960
FAX: 916.961.6552



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

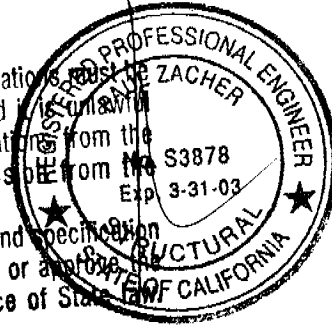
August 22, 2001

Antonio
7908 Pedrick Street
Sacramento, CA 95823
TEL: (916) 428-0591



This set of plans and specifications must be kept on the job at all times and no changes or alterations to be made without written permission from the Building Inspection Division.

The approval of this plan and specification SHALL NOT be held to permit or approve violation of any City Ordinance of State law.



Attn.: Mr. Antonio,

re: Job 2001_247: ANTONIO

Subject: Structural Investigation Report of the Roof for the Residence located at 7908 Pedrick Street, Sacramento, CA 95823.

As requested by Mr. Antonio, this is a report to determine what needs should be addressed to correct any structural deficiencies of the roof. Paul Zacher visited the site August 22, 2001. 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.

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

DESCRIPTION:

Type of Facility:	Residence.
Year Built:	Estimated 1970's vintage.
Occupancy:	Residential.
No. of Stories:	One.
Dimensions:	Approximately 1500 square feet with a first story plate height of 8 feet.

CONSTRUCTION:

Roof:
The roof covering will consist of a Light Weight Concrete Tile over 1/2" solid sheathing. The living and garage areas are framed with pre-engineered wood trusses 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.

P
A
U
L
Z
A
C
H
E
R
S
T
R
U
C
T
U
R
A
L
E
N
G
I
N
E
E
R
S

1/24

Antonio



Paul Zacher - Structural Engineers
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 7'-9". See detail 1.

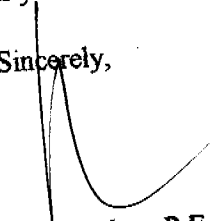
It shall be noted that small hairline cracking may occur at exterior stucco and interior gypboard finished walls that are load bearing or distributing roof strut loads. These cracks are a natural occurrence as the existing structure re-distributes the new roof weight. They are cosmetic in nature and 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 4 in 12
Pitch Adjustment Factor 1.05

LOCATION: ROOF

<u>MATERIAL</u>	<u>WEIGHT</u>	
Light Weight Tile	7.00	psf
Roofing felt	0.30	psf
1x4 skip sht'g	1.09	psf
1/2" OSB/ plywood	1.50	psf
2x4 rafters @ 24" oc	0.64	psf
Load	10.5	psf
Roof Pitch Adjustment	0.57	psf
Total Load	11.1	psf

LOCATION: TOP CHORD

<u>MATERIAL</u>	<u>WEIGHT</u>	
Light Weight Tile	7.00	psf
Roofing felt	0.30	psf
1/2" OSB/ plywood	1.50	psf
1x4 skip sht'g	1.09	psf
2x4 truss @ 24" oc	0.64	psf
Load	10.5	psf
Roof Pitch Adjustment	0.57	psf
Total Load	11.1	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

13

P.K. Zacher, S.E.

Job #: 01-297

Date: 8/22/01

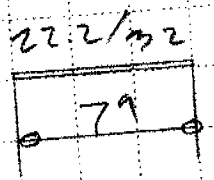
LOADING

RFTER

$Op = 11.1 puf @ 2^\circ = 22.2 puf$

$Lp = 16.0 \dots = 32$

2x4#2

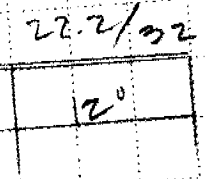


RFTER

$Op = 11.1 puf @ 2^\circ = 22.2 puf$

$Lp = 16.0 \dots = 32$

2x6#2

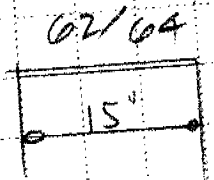


81

$Op = 15.4 puf @ 4^\circ = 62 puf$

$Lp = 16.0 \dots = 64$

4x12#2



Paul Zacher - Structural Engineers
 4701 Lakeside Way
 Fair Oaks
 TEL: (916) 961-3960
 FAX: (916) 961-8552

Title :
 Dsgnr:
 Description :

Job #
 Date: 12:10PM, 22 AUG 01

Scope :

Timber Beam & Joist

c:\enercalc\test.ecw\Calculations

Rev: 510304
 User: KW-0602844, Ver 5.1.3, 22-Jun-1999, Win32
 (c) 1983-99 ENERCALC

Description RAFTERS AND BEAMS

Calculations are designed to 1997 NDS and 1997 UBC Requirements

Timber Member Information

Timber Section		rafter 2x4	rafter 2x6	81 4x12
Beam Width	in	1.500	1.500	3.500
Beam Depth	in	3.500	5.500	11.250
Le: Unbraced Length	ft	0.00	2.00	0.00
Timber Grade		Douglas Fir - Larch	Douglas Fir - Larch	Douglas Fir - Larch
Fb - Basic Allow	psi	875.0	875.0	875.0
Fv - Basic Allow	psi	95.0	95.0	95.0
Elastic Modulus	ksi	1,600.0	1,600.0	1,600.0
Load Duration Factor		1.250	1.250	1.250
Member Type		Sawn	Sawn	Sawn
Repetitive Status		Repetitive	Repetitive	No

Center Span Data

	ft	7.75	12.00	15.00
Span				
Dead Load	#/ft	22.20	22.20	62.00
Live Load	#/ft	32.00	32.00	64.00

Results

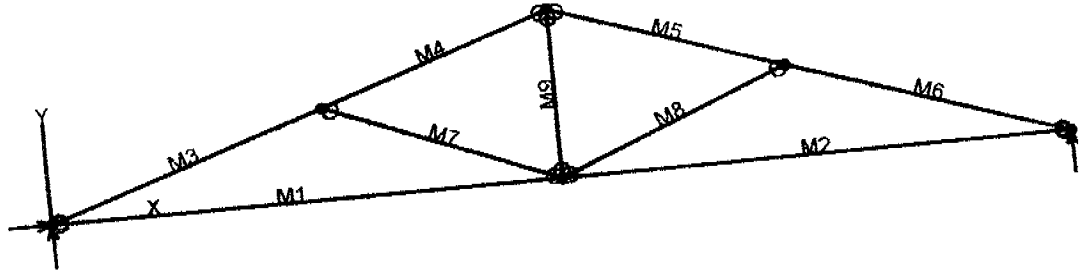
	Ratio =	0.8451	0.9648	0.4788
Mmax @ Center	in-k	4.88	11.71	42.52
@ X =	ft	3.87	6.00	7.50
fb : Actual	psi	1,594.5	1,548.1	576.0
Fb : Allowable	psi	1,886.7	1,604.5	1,203.1
		Bending OK	Bending OK	Bending OK
fv : Actual	psi	55.7	54.9	31.7
Fv : Allowable	psi	118.8	118.8	118.8
		Shear OK	Shear OK	Shear OK

Reactions

	DL	LL	Max. DL+LL	DL	LL	Max. DL+LL	DL	LL	Max. DL+LL
@ Left End	lbs	86.02	210.02	lbs	133.20	325.20	lbs	465.00	945.00
@ Right End	lbs	124.00	210.02	lbs	192.00	325.20	lbs	480.00	945.00

Deflections

	in	Ratio OK	Deflection OK	Deflection OK
Center DL Defl	-0.210			-0.106
L/Defl Ratio	442.6			1,693.6
Center LL Defl	-0.303			-0.110
L/Defl Ratio	307.0			1,640.7
Center Total Defl	-0.513			-0.216
Location	3.875			7.500
L/Defl Ratio	181.3			833.4



6

VisualAnalysis 3.50.c Report

08/22/01 11:44:28

Project: Truss 1

File: Untitled.Vap

Company: PK Associates Engineers

Engineer: Paul Zacher

Default Units: Feet, Pounds, Degrees, °Fahrenheit, Seconds.

Nodes

Node	X ft	Y ft	Fix	DX Fix	DY Fix	RZ Fix
N1	0.00	0.00	Yes	Yes	No	No
N2	11.00	0.00	No	No	Yes	"
N3	22.00	0.00	"	"	Yes	"
N4	6.00	2.00	"	"	No	"
N5	16.00	2.00	"	"	"	"
N6	11.00	3.67	"	"	"	"

Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	11.00
M2	"	"	11.00
M3	"	"	6.32
M4	"	"	5.27
M5	"	"	5.27
M6	"	"	6.32
M7	"	"	5.39
M8	"	"	5.39
M9	"	"	3.67

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: Equation Case 1
 Combination: +1D+1L+1Lr
 Contributing Cases & Source
 Service Case 1 (Dead loads)
 Service Case 2 (Roof Live loads)

Member Uniform Loads

This item is empty. Check the selection state, or report properties.

Nodal Reactions

Node	Load Case	FX lbs	FY lbs	MZ lb-ft
N1	Equation Case 1	-0.00	723.11	-NA-
N3	"	-NA-	723.11	-NA-

Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	1638.91	-57.36	-110.71	-0.1481
"	1638.91	-25.83	41.5251	-0.2120
"	1638.91	5.7019	78.4291	-0.1937
"	1638.91	37.2353	0.0000	-0.0000
M2	1638.91	-37.24	-0.0000	-0.0000
"	1638.91	-5.7019	78.4291	-0.1937
"	1638.91	25.8314	41.5251	-0.2119
"	1638.91	57.3647	-110.71	-0.1481
M3	-1771.70	132.41	0.0000	-0.0000
"	-1735.57	24.0059	164.30	-0.1526
"	-1699.43	-84.39	100.65	-0.1827
"	-1663.30	-192.79	-190.96	-0.1436
M4	-1231.73	171.73	-190.96	-0.1436
"	-1201.56	81.3924	31.0247	-0.1673
"	-1171.39	-8.9409	94.6796	-0.1804
"	-1141.22	-99.27	0.0000	-0.1457
M5	-1231.73	-171.73	-190.96	-0.1282
"	-1201.56	-81.39	31.0247	-0.1520
"	-1171.39	8.9409	94.6796	-0.1650
"	-1141.22	99.2743	0.0000	-0.1303
M6	-1771.70	-132.41	-0.0000	0.0153
"	-1735.57	-24.01	164.30	-0.1373
"	-1699.43	84.3941	100.65	-0.1674
"	-1663.30	192.79	-190.96	-0.1283
M7	-565.47	-0.0000	-0.0000	-0.1285
"	-565.47	-0.0000	-0.0000	-0.1254
"	-565.47	-0.0000	-0.0000	-0.1222
"	-565.47	-0.0000	0.0000	-0.1191
M8	-565.47	0.0000	0.0000	-0.1465
"	-565.47	0.0000	0.0000	-0.1434
"	-565.47	0.0000	0.0000	-0.1402
"	-565.47	0.0000	0.0000	-0.1371
M9	534.75	-0.0000	-0.0000	-0.0242
"	534.75	-0.0000	-0.0000	-0.0242
"	534.75	-0.0000	-0.0000	-0.0242
"	534.75	-0.0000	0.0000	-0.0242

BENDING & COMP: TRUSS 1 - MEMBER 3
 Design based on 1997 UBC 2321 Division V and ANSI/TPI 1-1995

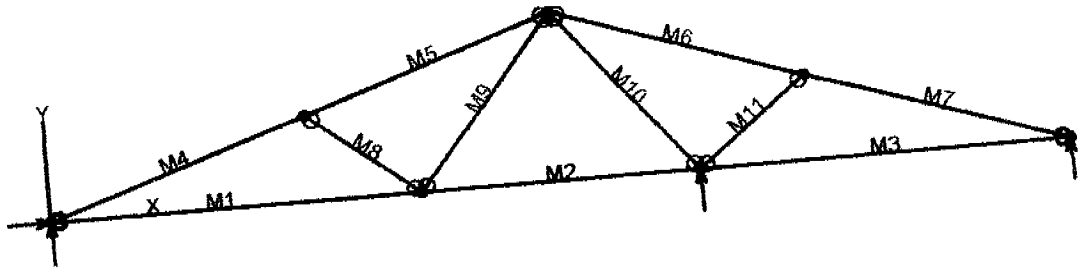
Grading:
 2x or 4x

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	6.32 feet
Max Axial Comp, C	1663 feet
Max Reaction, R	192 feet
Max Moment, M	190 feet
Max LL Deflection	0.07 feet
Max TL Deflection	0.14 feet
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 =	1.17
fc =	317 psi
Fce =	1275 psi
Fc* =	2084 psi
F'c =	1057 psi
fb =	744 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.46 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	0.55 < 1.0, Member OK
fb / (F'b(1-fc/Fce)) =	0.22 < 1.0, Member OK
Live Load defl ratio	0.33 < 1.0, Member OK
Total Load defl ratio	



VisualAnalysis 3.50.c Report

08/22/01 11:57:47

Project: Truss 2

File: C:\Program Files\IES\VA35\truss 2.vap

Company: PK Associates Engineers

Engineer: Paul Zacher

Default Units: Feet, Pounds, Degrees, °Fahrenheit, Seconds.

Nodes

Node	X ft	Y ft	Fix	DX ft	Fix	DY ft	Fix	RZ
N1	0.00	0.00	Yes		Yes		No	
N2	10.00	0.00	No		No			
N3	17.50	0.00	"		"			
N4	27.50	0.00	"		"			
N5	7.00	2.33	"		No			
N6	20.50	2.33	"		"			
N7	13.75	4.58	"		"			

Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	10.00
M2	"	"	7.50
M3	"	"	10.00
M4	"	"	7.38
M5	"	"	7.12
M6	"	"	7.12
M7	"	"	7.38
M8	"	"	3.80
M9	"	"	5.92
M10	"	"	5.92
M11	"	"	3.80

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: Equation Case 1
 Combination: +1D+1L+1Lr
 Contributing Cases & Source
 Service Case 1 (Dead loads)
 Service Case 2 (Roof Live loads)

Member Uniform Loads

This item is empty. Check the selection state, or report properties.

Nodal Reactions

Node	Load Case	FX lbs	FY lbs	MZ lb-ft
N1	Equation Case 1	0.00	469.58	-NA-
N3	"	-NA-	1193.99	-NA-
N4	"	-NA-	143.94	-NA-

Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	838.95	-49.11	-61.13	-0.0435
"	838.95	-20.45	54.5659	-0.1418
"	838.95	8.2207	74.9413	-0.1415
"	838.95	36.8874	0.0000	-0.0000
M2	55.3277	-34.70	-79.49	-0.0000
"	55.3277	-13.20	-19.76	0.0116
"	55.3277	8.3011	-13.63	-0.0053
"	55.3277	29.8011	-61.13	-0.0435
M3	-126.78	-35.05	-0.0000	-0.0000
"	-126.78	-6.3840	68.8190	-0.1098
"	-126.78	22.2826	42.3214	-0.0913
"	-126.78	50.9493	-79.49	-0.0000
M4	-932.66	145.59	0.0000	-0.0000
"	-890.57	19.1199	201.75	-0.1779
"	-848.47	-107.35	93.2617	-0.1541
"	-806.38	-233.81	-325.45	-0.0520
M5	-497.26	228.67	-325.45	-0.0520
"	-456.61	106.72	71.5394	-0.1316
"	-415.96	-15.23	180.02	-0.1597
"	-375.31	-137.18	0.0000	-0.0213
M6	524.04	-230.98	-341.89	0.0024
"	564.69	-109.03	60.5804	-0.0868
"	605.34	12.9239	174.54	-0.1360
"	645.99	134.87	0.0000	-0.0248
M7	85.8981	-143.36	0.0000	0.0032
"	127.99	-16.89	196.27	-0.1493
"	170.09	109.57	82.3028	-0.1063
"	212.18	236.04	-341.89	0.0024
M8	-556.50	0.0000	0.0000	-0.0361
"	-556.50	0.0000	0.0000	-0.0332
"	-556.50	0.0000	0.0000	-0.0303
"	-556.50	0.0000	0.0000	-0.0275
M9	543.17	0.0000	0.0000	-0.0363
"	543.17	0.0000	0.0000	-0.0279
"	543.17	0.0000	0.0000	-0.0196
"	543.17	0.0000	0.0000	-0.0112
M10	-987.37	0.0000	0.0000	-0.0196
"	-987.37	0.0000	0.0000	-0.0100
"	-987.37	0.0000	0.0000	-0.0004
"	-987.37	0.0000	0.0000	0.0092
M11	-561.44	-0.0000	0.0000	-0.0073
"	-561.44	-0.0000	-0.0000	-0.0067
"	-561.44	-0.0000	-0.0000	-0.0061
"	-561.44	-0.0000	-0.0000	-0.0055

BENDING & COMP: TRUSS 2 - MEMBER 4

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

Grading:

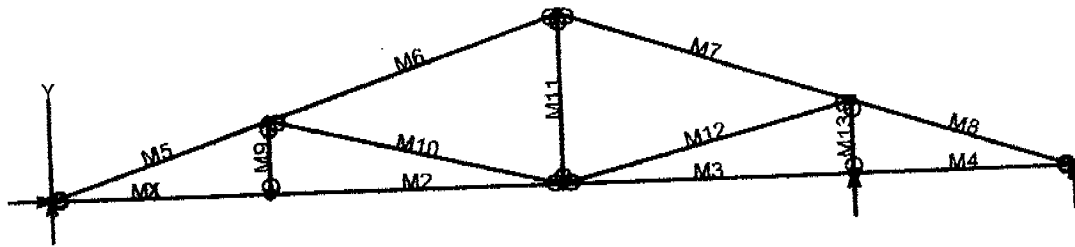
2x or 4x

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	7.38 feet
Max Axial Comp, C	806 feet
Max Reaction, R	233 feet
Max Moment, M	325 feet
Max LL Deflection	0.02 feet
Max TL Deflection	0.05 feet
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 =	1.20
fc =	154 psi
Fce =	958 psi
Fc* =	2084 psi
F'c =	844 psi
fb =	1273 psi ✓ ok
F'b = Fb* =	2156 psi
Shear D/C ratio	0.56 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	0.74 < 1.0, Member OK ✓
fb / (F'b(1-fc/Fce)) =	0.05 < 1.0, Member OK ✓
Live Load defl ratio	
Total Load defl ratio	0.10 < 1.0, Member OK ✓



VisualAnalysis 3.50.c Report

08/22/01 12:01:55

Project: Truss 3

File: C:\Program Files\IES\VA35\truss 3.vap

Company: PK Associates Engineers

Engineer: Paul Zacher

Default Units: Feet, Pounds, Degrees, °Fahrenheit, Seconds.

Nodes

Node	X ft	Y ft	Fix DX	Fix DY	Fix RZ
N1	0.00	0.00	Yes	Yes	No
N2	6.00	0.00	No	No	"
N3	14.00	0.00	"	"	"
N4	22.00	0.00	"	Yes	"
N5	28.00	0.00	"	"	"
N6	6.00	2.00	"	No	"
N7	22.00	2.00	"	"	"
N8	14.00	4.67	"	"	"

Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	6.00
M2	"	"	8.00
M3	"	"	8.00
M4	"	"	6.00
M5	"	"	6.32
M6	"	"	8.43
M7	"	"	8.43
M8	"	"	6.32
M9	"	"	2.00
M10	"	"	8.25
M11	"	"	4.67
M12	"	"	8.25
M13	"	"	2.00

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: Equation Case 1
 Combination: +1D+1L+1Lr
 Contributing Cases & Source

Service Case 1 (Dead loads)
 Service Case 2 (Roof Live loads)

Member Uniform Loads

This item is empty. Check the selection state, or report properties.

Nodal Reactions

Node	Load Case	FX lbs	FY lbs	MZ lb-ft
N1	Equation Case 1	-0.00	678.40	-NA-
N4	"	-NA-	1128.87	-NA-
N5	"	-NA-	33.34	-NA-

Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	1619.16	-27.42	-9.7347	-0.1330
"	1619.16	-10.22	27.8242	-0.1085
"	1619.16	6.9776	31.0691	-0.0649
"	1619.16	24.1776	0.0000	-0.0000
M2	1619.16	-39.31	-48.99	-0.0826
"	1619.16	-16.37	25.0974	-0.1324
"	1619.16	6.5597	38.1827	-0.1551
"	1619.16	29.4930	-9.7347	-0.1330
M3	-274.28	-34.97	-53.57	-0.0000
"	-274.28	-12.04	8.9576	-0.0336
"	-274.28	10.8940	10.4848	-0.0618
"	-274.28	33.8273	-48.99	-0.0826
M4	-274.28	-16.87	-0.0000	-0.0000
"	-274.28	0.3287	16.4566	-0.0058
"	-274.28	17.5287	-1.4008	-0.0013
"	-274.28	34.7287	-53.57	-0.0000
M5	-1742.95	108.63	0.0000	-0.0000
"	-1706.82	0.2308	114.18	-0.0936
"	-1670.68	-108.17	0.4018	-0.1070
"	-1634.55	-216.57	-341.33	-0.1353
M6	-786.73	257.27	-341.33	-0.1353
"	-738.49	112.74	177.75	-0.3900
"	-690.25	-31.79	291.53	-0.4278
"	-642.01	-176.33	0.0000	-0.0791
M7	-788.30	-261.98	-381.02	0.0041
"	-740.06	-117.44	151.29	-0.2634
"	-691.82	27.0892	278.30	-0.3533
"	-643.58	171.62	0.0000	-0.0768
M8	255.00	-102.36	0.0000	0.0080
"	291.13	6.0442	100.95	-0.0269
"	327.26	114.44	-26.06	0.0072
"	363.40	222.84	-381.02	0.0041
M9	56.9154	-0.0000	-0.0000	0.0131
"	56.9154	-0.0000	-0.0000	0.0184
"	56.9154	-0.0000	-0.0000	0.0238
"	56.9154	-0.0000	0.0000	0.0292
M10	-983.71	0.0000	0.0000	-0.1218
"	-983.71	0.0000	0.0000	-0.1055
"	-983.71	0.0000	0.0000	-0.0891
"	-983.71	0.0000	0.0000	-0.0728
M11	76.9458	0.0000	0.0000	-0.0305
"	76.9458	0.0000	0.0000	-0.0215
"	76.9458	0.0000	0.0000	-0.0126

"	76.9458	0.0000	0.0000	-0.0037
M12	968.00	0.0000	0.0000	-0.0876
"	968.00	0.0000	0.0000	-0.0610
"	968.00	0.0000	0.0000	-0.0345
"	968.00	0.0000	0.0000	-0.0080
M13	-1059.16	0.0000	0.0000	0.0216
"	-1059.16	0.0000	0.0000	0.0236
"	-1059.16	0.0000	0.0000	0.0256
"	-1059.16	0.0000	0.0000	0.0275

BENDING & COMP: TRUSS 3 - MEMBER 5

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

Grading:

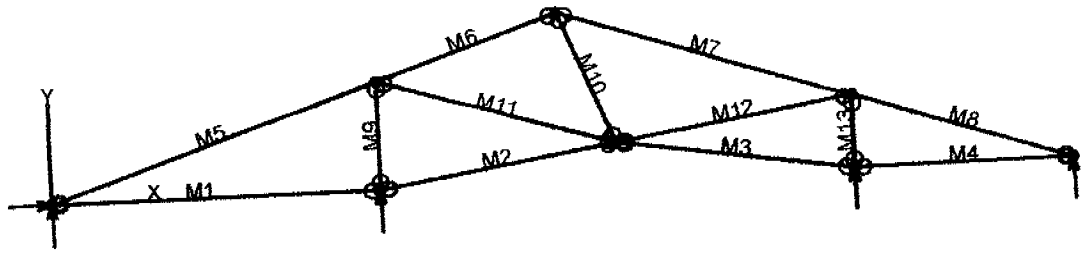
2x or 4x

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	6.32 feet
Max Axial Comp, C	1634 feet
Max Reaction, R	216 feet
Max Moment, M	341 feet
Max LL Deflection	0.06 feet
Max TL Deflection	0.13 feet
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 =	1.17
fc =	311 psi
Fce =	1275 psi
Fc* =	2084 psi
F'c =	1057 psi
fb =	1336 psi /
F'b = Fb* =	2156 psi
Shear D/C ratio	0.52 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	0.91 < 1.0, Member OK
fb / (F'b(1-fc/Fce)) =	0.19 < 1.0, Member OK
Live Load defl ratio	
Total Load defl ratio	0.31 < 1.0, Member OK



VisualAnalysis 3.50.c Report

08/22/01 11:55:03

Project: Truss 4

File: C:\Program Files\IES\VA35\truss 4.vap

Company: PK Associates Engineers

Engineer: Paul Zacher

Default Units: Feet, Pounds, Degrees, °Fahrenheit, Seconds.

Nodes

Node	X ft	Y ft	Fix DX	Fix DY	Fix RZ
N1	0.00	0.00	Yes	Yes	No
N2	9.00	0.00	No	"	"
N3	15.50	1.00	"	No	"
N4	22.00	0.00	"	Yes	"
N5	28.00	0.00	"	"	"
N6	9.00	3.00	"	No	"
N7	14.00	4.67	"	"	"
N8	22.00	2.00	"	"	"

Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	9.00
M2	"	"	6.58
M3	"	"	6.58
M4	"	"	6.00
M5	"	"	9.49
M6	"	"	5.27
M7	"	"	8.43
M8	"	"	6.32
M9	"	"	3.00
M10	"	"	3.96
M11	"	"	6.80
M12	"	"	6.58
M13	"	"	2.00

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: Equation Case 1
 Combination: +1D+1L+1Lr
 Contributing Cases & Source

Service Case 1 (Dead loads)
 Service Case 2 (Roof Live loads)

Member Uniform Loads

This item is empty. Check the selection state, or report properties.

Nodal Reactions

Node	Load Case	FX lbs	FY lbs	MZ lb-ft
N1	Equation Case 1	0.00	242.81	-NA-
N2	"	-NA-	783.06	-NA-
N4	"	-NA-	684.67	-NA-
N5	"	-NA-	131.38	-NA-

Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	-13.28	-38.70	0.0000	-0.0000
"	-13.28	-12.90	77.2065	-0.1208
"	-13.28	12.9000	77.2065	-0.1208
"	-13.28	38.7000	0.0000	-0.0000
M2	-17.73	27.9500	0.0000	0.0000
"	-14.86	9.3167	40.7451	-0.0379
"	-12.00	-9.3167	40.7451	-0.0418
"	-9.1315	-27.95	0.0000	-0.0116
M3	-15.73	-27.95	0.0000	0.0005
"	-12.87	-9.3167	40.7451	-0.0374
"	-9.9984	9.3167	40.7451	-0.0413
"	-7.1317	27.9500	0.0000	-0.0111
M4	-11.30	-25.80	0.0000	-0.0000
"	-11.30	-8.6000	34.3140	-0.0239
"	-11.30	8.6000	34.3140	-0.0239
"	-11.30	25.8000	0.0000	-0.0000
M5	-51.95	197.83	0.0000	-0.0000
"	2.2485	35.2349	367.23	-0.5250
"	56.4485	-127.37	221.56	-0.4347
"	110.65	-289.97	-437.01	-0.0032
M6	-351.62	218.40	-437.01	-0.0032
"	-321.45	128.07	-133.01	0.0507
"	-291.28	37.7339	12.6637	0.0197
"	-261.11	-52.60	0.0000	-0.0117
M7	-335.33	-260.94	-372.29	-0.0009
"	-287.09	-116.41	157.11	-0.2519
"	-238.85	28.1236	281.21	-0.3165
"	-190.61	172.66	0.0000	-0.0105
M8	-22.67	-103.74	0.0000	0.0010
"	13.4649	4.6648	103.86	-0.0366
"	49.5983	113.06	-20.24	-0.0026
"	85.7316	221.46	-372.29	-0.0009
M9	-714.04	-0.0000	-0.0000	-0.0002
"	-714.04	-0.0000	-0.0000	0.0003
"	-714.04	-0.0000	-0.0000	0.0008
"	-714.04	-0.0000	0.0000	0.0014
M10	-76.27	0.0000	0.0000	-0.0030
"	-76.27	0.0000	0.0000	-0.0028
"	-76.27	0.0000	0.0000	-0.0027
"	-76.27	0.0000	0.0000	-0.0026
M11	290.44	-0.0000	-0.0000	-0.0105
"	290.44	-0.0000	-0.0000	-0.0078

"	290.44	-0.0000	-0.0000	-0.0051
"	290.44	-0.0000	0.0000	-0.0024
M12	249.67	-0.0000	0.0000	-0.0116
"	249.67	-0.0000	-0.0000	-0.0084
"	249.67	-0.0000	-0.0000	-0.0052
"	249.67	-0.0000	-0.0000	-0.0020
M13	-628.86	0.0000	0.0000	0.0022
"	-628.86	0.0000	0.0000	0.0025
"	-628.86	0.0000	0.0000	0.0028
"	-628.86	0.0000	0.0000	0.0032

BENDING & COMP: TRUSS 4 - MEMBER 5

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

Grading:

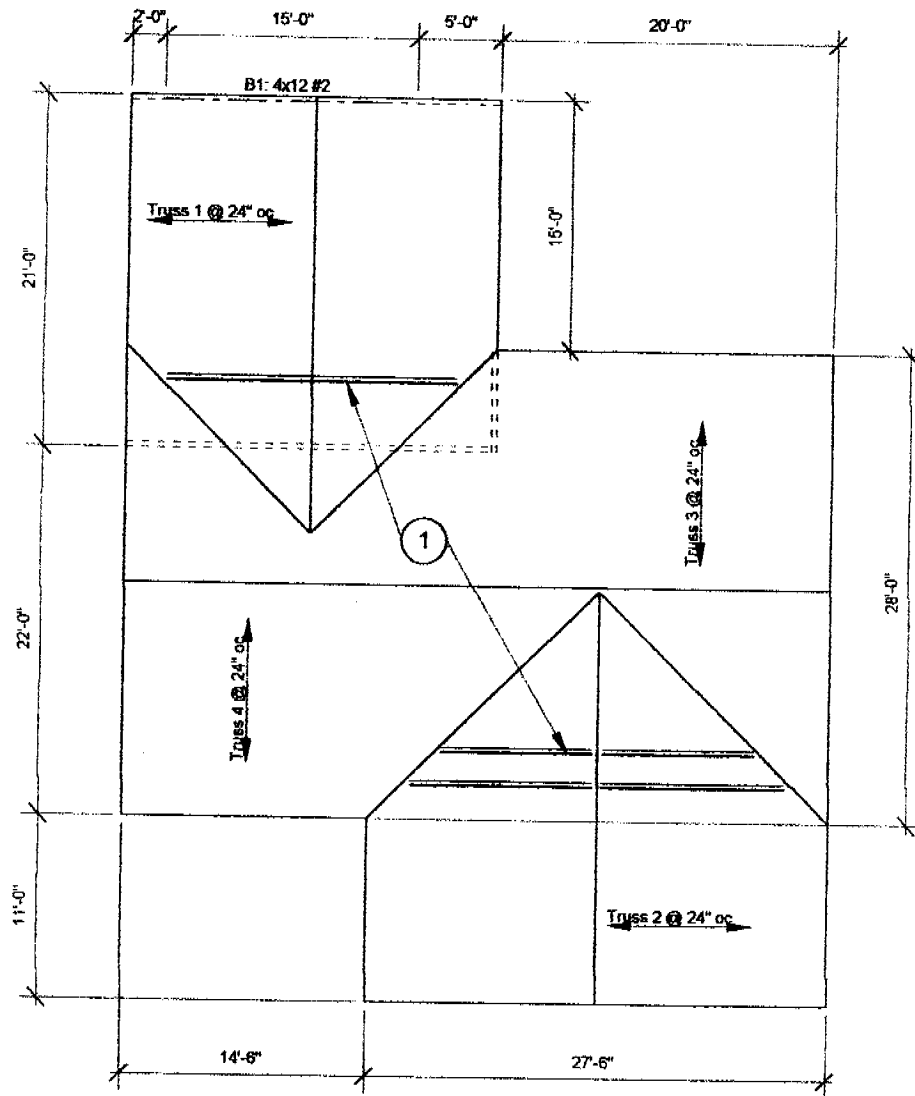
2x or 4x

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	9.49 feet
Max Axial Comp, C	110 feet
Max Reaction, R	289 feet
Max Moment, M	437 feet
Max LL Deflection	0.2 feet
Max TL Deflection	0.43 feet
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 =	1.26
fc =	21 psi
Fce =	608 psi
Fc* =	2084 psi
F'c =	565 psi
fb =	1712 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.70 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	
fb / (F'b(1-fc/Fce)) =	0.82 < 1.0, Member OK
Live Load defl ratio	0.42 < 1.0, Member OK
Total Load defl ratio	0.68 < 1.0, Member OK



FRAMING NOTES:

1. Scab a 2x6 to existing 2x4 rafters where the span is greater than 7'-9" (total 6).

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



ROOF PLAN - ANTONIO

Not to Scale

24