

**CITY OF SACRAMENTO**  
1231 I Street, Sacramento, CA 95814

**Permit No: 0109879**

**Insp Area: 2**  
**Thos Bros: 336H2**

**Site Address: 82 HIDDEN COVE CR SAC**  
Parcel No: 031-0650-034

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

**CONTRACTOR**  
ZIMMERMAN ROOFING INC  
3675 R STREET  
SACRAMENTO, CA 95816

**OWNER**  
CHAN TING CHING/MAN NA  
82 HIDDEN COVE CR  
SACRAMENTO CA 95831

**ARCHITECT**

**Nature of Work: TEAR OFF REROOF W/MONIER TILE 4:12 PITCH 24 SQ**

**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 C51 License Number 557559 Date 8/3/01 Contractor Signature Alma Gonzalez

**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. **PAID** 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: AUG 03 2001  
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 improvements to be constructed do 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.

Date 8-3-01 Applicant/Agent Signature Alma Gonzalez

**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.

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 STAFF FUND Policy Number 713-00-2021 Exp Date 10/01/2001

(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.

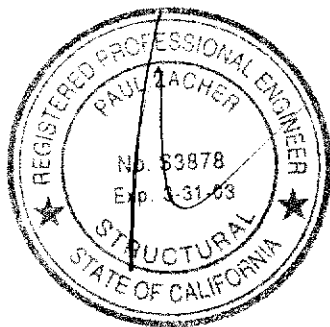
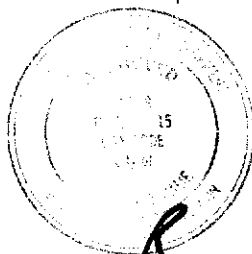
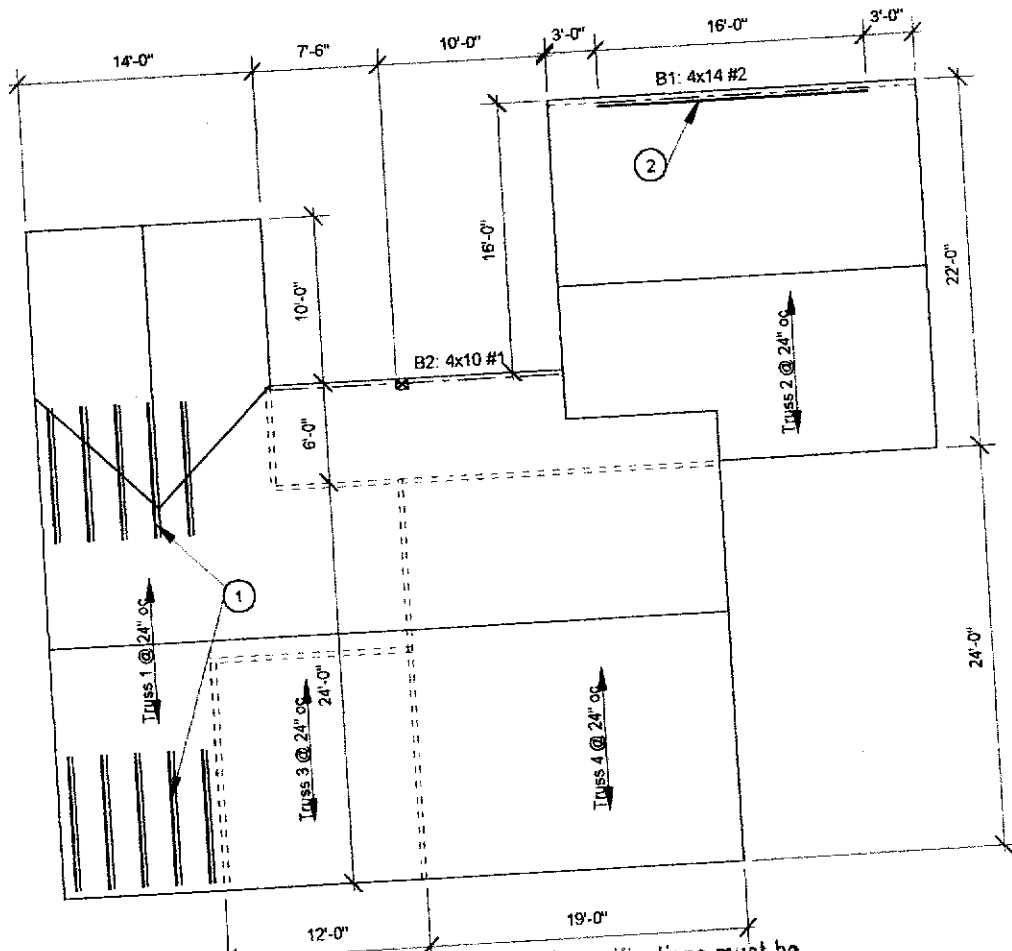
Date 8/3/01 Applicant Signature Alma Gonzalez

**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.**

# 82 HIDDEN COVE CIR.

0107373



This set of plans and specifications must be kept on the job at all times and it is unlawful to make any changes or alterations from the same without written permission from the Building Inspection Division. The approval of this plan and specification SHALL NOT be held to permit or approve the violation of any City Ordinance or State Law.

*Julal* 10/3/01

**FRAMING NOTES:**

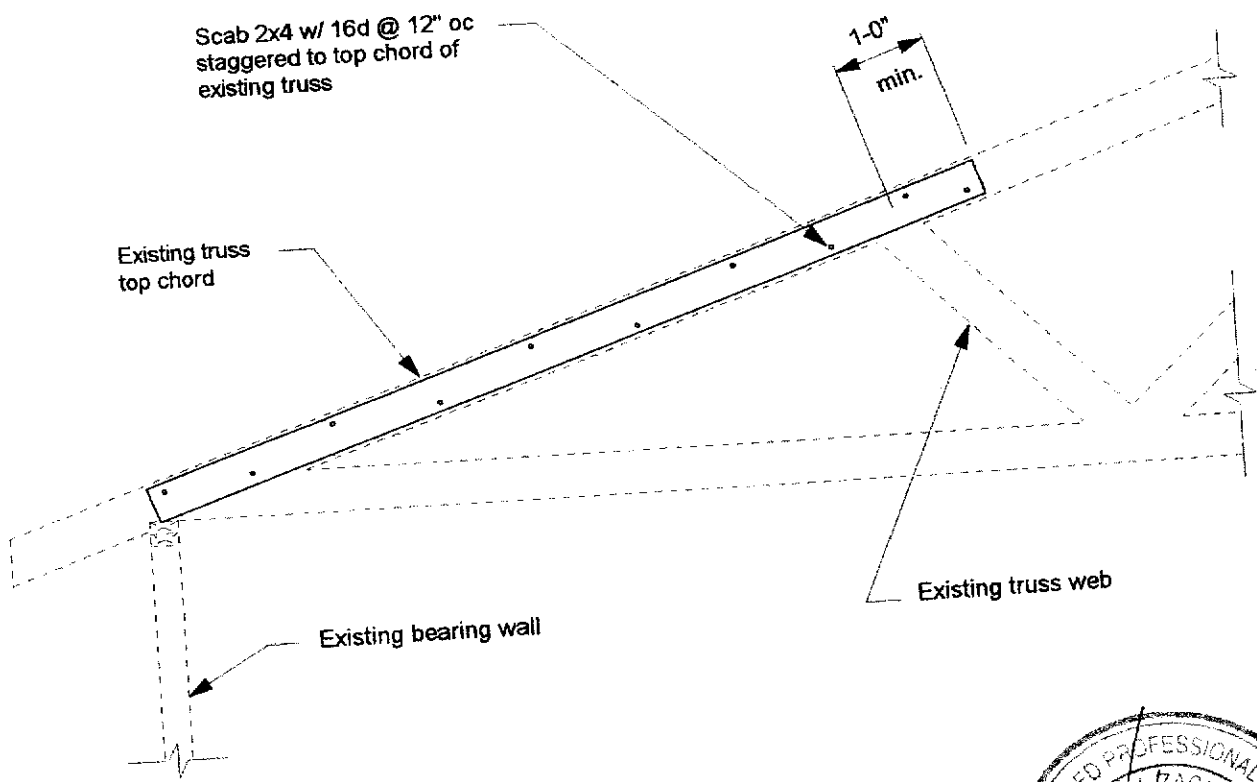
1. Scab a 2x4 x 10'-0" to the top chord of the existing truss (total 10). See detail 2.
2. Scab a 1 3/4" x 11 1/4" LVL to the existing 4x12 beam. See detail 3.

**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 7.0 psf.
- B. All rafters are 2x6 DF#2 and hips and valleys are 2x8 DF#2 unless otherwise noted.
- C. All existing rafter, hips, valleys, rafter ties, and purlins are braced per UBC Section 2320.1 "Roof and Ceiling Framing" unless otherwise shown.
- D. All structural wood members that were observed appear to be in sound condition and without structural defect.

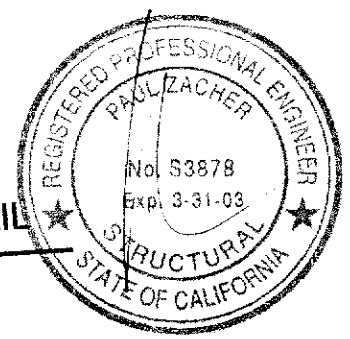
1 ————— **ROOF PLAN - CHAN**  
 Not to Scale

24

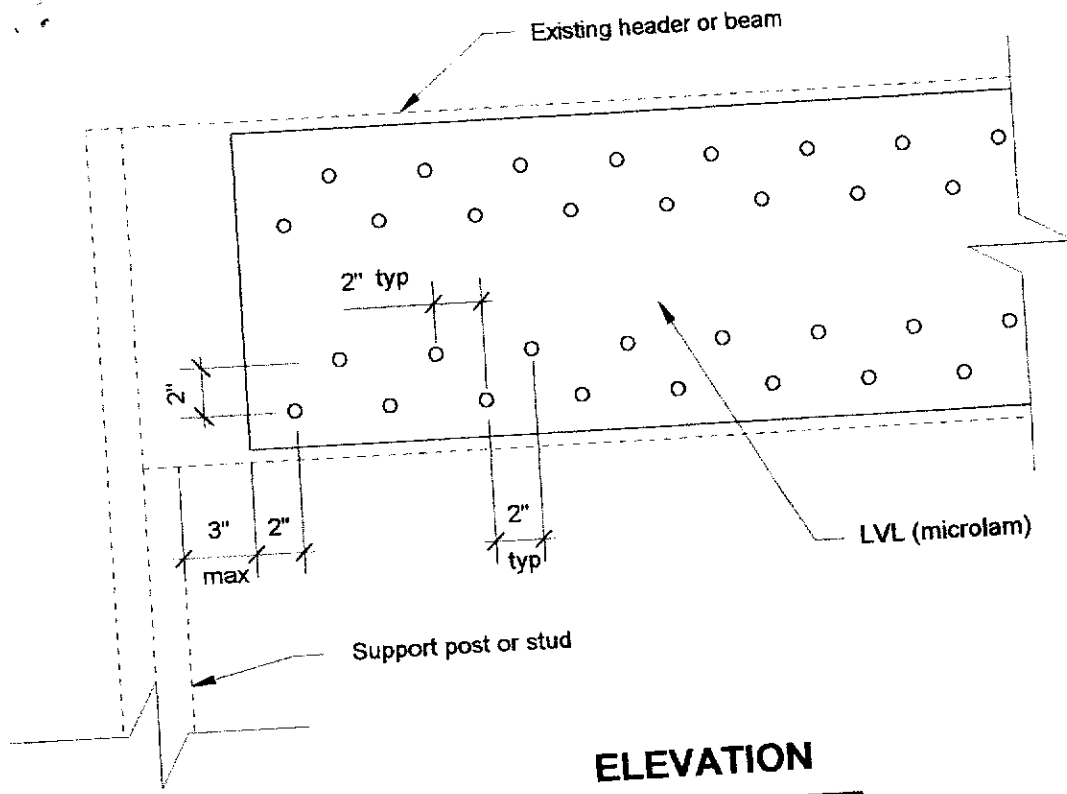


2 TRUSS REINFORCEMENT DETAIL

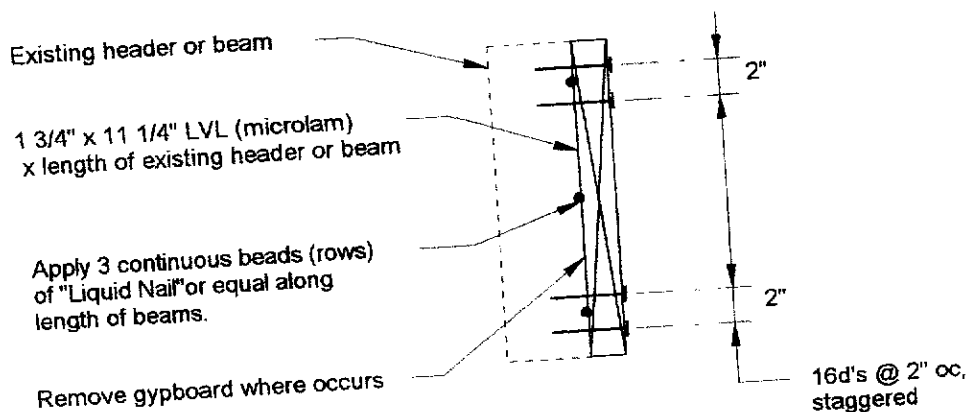
scale: 1/2" = 1'-0"



25



**ELEVATION**

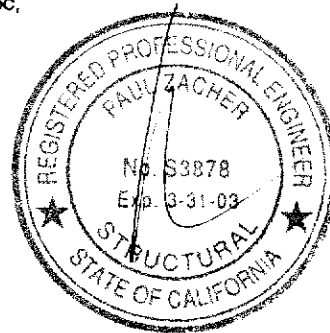


**SECTION**

**HEADER DETAIL**

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

3



Chan

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

TEL: 916.961.3960  
FAX: 916.961.6552



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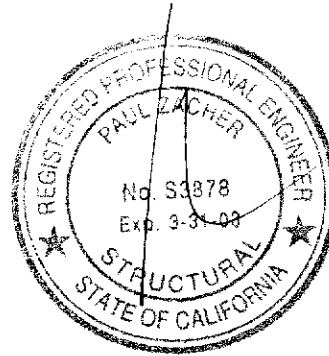
July 12, 2001

Zimmerman Roofing  
3675 R Street  
Sacramento, CA 95816  
TEL: 916.454.3667  
FAX: 916.455.3784

Attn.: Mr. Jeff Tucker,

re: Job 2001\_146: CHAN

Subject: Structural Investigation Report of the Roof for the Residence located at 82 Hidden Cove Circle, Sacramento, CA 95831.



As requested by Mr. Jeff Tucker, 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 12, 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 1980'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 living and garage areas currently lack sufficient structural capacity for the applied live and dead loads. See "Recommendations" for location and repair to bring the living and garage areas up to the required capacity.

Chan



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.

Living Area:

1. Scab a 2x4 DF#2 x 10'-0" long rafter to the top chord of the existing truss. See details 1 and 2.

Garage:

2. Scab a 1 3/4" x 11 1/4" LVL to the existing header. See details 1 and 3.

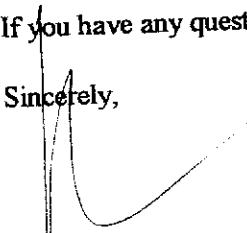
It shall be noted that small hairline cracking may occur at exterior stucco and interior gypboard finished walls that are load bearing or distributing roof strut loads. These cracks are a natural occurrence as the existing structure re-distributes the new roof weight. They are cosmetic in nature and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

**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	<u>0.64</u>	psf
	Load	10.5    psf
Roof Pitch Adjustment	<u>0.57</u>	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	<u>2.50</u>	psf
	Load	4.3      psf

P.K. Zacher, S.E.

Job #: 01-146

Date: 7/12/01

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

LOADING

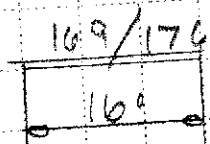
B1

OP = 15.4 P.F. @ 110 = 169 p.f.

LP = 16.0 " " " = 170

4 x 14" 2 +

1 3/4 x 11 1/4 LVL



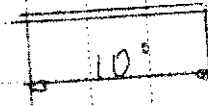
B2

OP = 15.4 P.F. @ 30 = 46 p.f.

LP = 16.0 " " " = 48

4 x 10" 1

40/48





Paul Zacher - Structural Engineers  
 4701 Lakeside Way  
 Fair Oaks  
 TEL: (916) 961-3960  
 FAX: (916) 961-6552

Title :  
 Dsgnr:  
 Description :

Job #  
 Date: 2:58PM, 12 JUL 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 BEAMS

Calculations are designed to 1997 NDS and 1997 UBC Requirements

#### Timber Member Information

		B1	B2
Timber Section		4x12 + 1.7	4x10
Beam Width	in	5.250	3.500
Beam Depth	in	11.250	9.250
Le: Unbraced Length	ft	2.00	0.00
Timber Grade		stom, DF#2 + LVL Douglas Fir - Larch,	
Fb - Basic Allow	psi	1,450.0	1,000.0
Fv - Basic Allow	psi	158.0	95.0
Elastic Modulus	ksi	1,666.7	1,700.0
Load Duration Factor		1.250	1.250
Member Type		Manuf/Pine	Sawn
Repetitive Status		No	No

#### Center Span Data

Span	ft	16.00	10.00
Dead Load	#/ft	169.00	46.00
Live Load	#/ft	176.00	48.00

#### Results

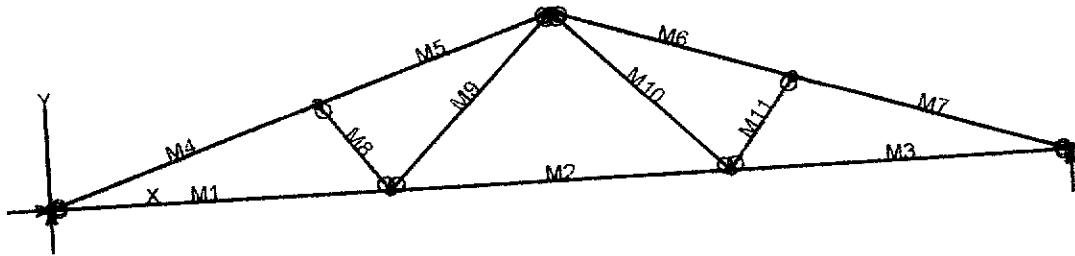
		Ratio =	0.6613	0.1883
Mmax @ Center	in-k	132.48	14.10	
@ X =	ft	8.00	5.00	
fb : Actual	psi	1,196.3	282.5	
Fb : Allowable	psi	1,809.1	1,500.0	
		Bending OK	Bending OK	
fv : Actual	psi	62.2	18.5	
Fv : Allowable	psi	197.5	118.8	
		Shear OK	Shear OK	

#### Reactions

@ Left End	DL	lbs	1,352.00	230.00
	LL	lbs	1,408.00	240.00
	Max. DL+LL	lbs	2,760.00	470.00
@ Right End	DL	lbs	1,352.00	230.00
	LL	lbs	1,408.00	240.00
	Max. DL+LL	lbs	2,760.00	470.00

#### Deflections

		Ratio OK	Deflection OK
Center DL Defl	in	-0.240	-0.026
L/Defl Ratio		799.9	4,550.0
Center LL Defl	in	-0.250	-0.028
L/Defl Ratio		768.1	4,360.4
Center Total Defl	in	-0.490	-0.054
Location	ft	8.000	5.000
L/Defl Ratio		391.8	2,226.6



# VisualAnalysis 3.50.c Report

07/12/01 14:29:15

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
N1	0.00	0.00	Yes	Yes	No	
N2	10.00	0.00	No	No	"	"
N3	20.00	0.00	"	"	"	"
N4	30.00	0.00	"	Yes	"	"
N5	8.00	2.67	"	No	"	"
N6	22.00	2.67	"	"	"	"
N7	15.00	5.00	"	"	"	"

## Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	10.00
M2	"	"	10.00
M3	"	"	10.00
M4	"	"	8.43
M5	"	"	7.38
M6	"	"	7.38
M7	"	"	8.43
M8	"	"	3.34
M9	"	"	7.07
M10	"	"	7.07
M11	"	"	3.34

## 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-	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	985.98	-NA-
N4	"	-NA-	985.98	-NA-

## Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	2302.48	-49.86	-68.61	-0.2749
"	2302.48	-21.19	49.5759	-0.2873
"	2302.48	7.4722	72.4463	-0.2116
"	<b>2302.48</b>	36.1389	0.0000	-0.0000
M2	1471.10	-43.00	-68.61	-0.2749
"	1471.10	-14.33	26.7055	-0.3147
"	1471.10	14.3333	26.7055	-0.3147
"	1471.10	43.0000	-68.61	-0.2749
M3	2302.48	-36.14	-0.0000	-0.0000
"	2302.48	-7.4722	72.4463	-0.2116
"	2302.48	21.1944	49.5759	-0.2873
"	2302.48	49.8611	-68.61	-0.2749
M4	<b>-2484.75</b>	172.06	0.0000	-0.0000
"	-2436.51	27.5233	<b>279.52</b>	-0.3936
"	-2388.28	-117.01	153.73	<b>-0.4189</b>
"	-2340.04	<b>-261.54</b>	<b>-377.36</b>	-0.2629
M5	-2173.51	240.85	-377.36	-0.2630
"	-2131.41	114.38	58.6581	-0.3530
"	-2089.32	-12.08	184.44	-0.4043
"	-2047.22	-138.55	0.0000	-0.2738
M6	-2173.51	-240.85	-377.36	-0.2372
"	-2131.41	-114.38	58.6581	-0.3272
"	-2089.32	12.0843	184.44	-0.3785
"	-2047.22	138.55	0.0000	-0.2480
M7	-2484.75	-172.06	0.0000	<b>0.0259</b>
"	-2436.51	-27.52	279.52	-0.3678
"	-2388.28	117.01	153.73	-0.3930
"	-2340.04	<b>261.54</b>	-377.36	-0.2371
M8	-527.56	0.0000	0.0000	-0.1400
"	-527.56	0.0000	0.0000	-0.1296
"	-527.56	0.0000	0.0000	-0.1192
"	-527.56	0.0000	0.0000	-0.1089
M9	728.45	0.0000	0.0000	-0.2233
"	728.45	0.0000	0.0000	-0.2209
"	728.45	0.0000	0.0000	-0.2186
"	728.45	0.0000	0.0000	-0.2162
M10	728.45	-0.0000	0.0000	-0.1655
"	728.45	-0.0000	-0.0000	-0.1632
"	728.45	-0.0000	-0.0000	-0.1608
"	728.45	-0.0000	-0.0000	-0.1585
M11	-527.56	0.0000	0.0000	-0.2054
"	-527.56	0.0000	0.0000	-0.1950
"	-527.56	0.0000	0.0000	-0.1846
"	-527.56	0.0000	0.0000	-0.1743

# **BENDING & COMP: TRUSS 1 - MEMBER 4**

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

## Grading:

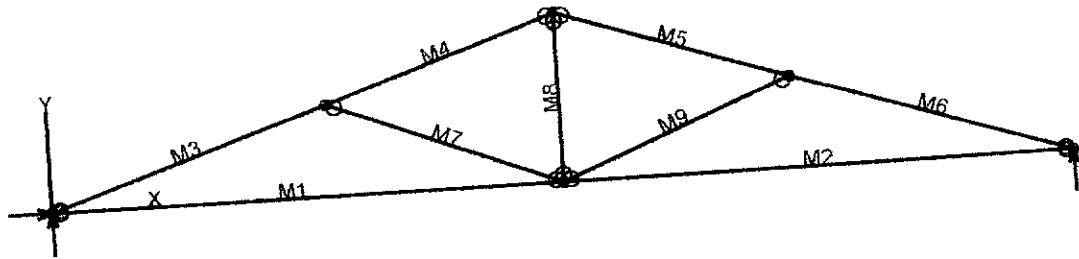
2x or 4x

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	3 inches
Depth, d	3.5 inches
Length	8.43 feet
Max Axial Comp, C	2340 feet
Max Reaction, R	261 feet
Max Moment, M	377 feet
Max LL Deflection	0.13 feet
Max TL Deflection	0.26 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 =	1.23
fc =	223 psi
Fce =	752 psi
Fc* =	2084 psi
F'c =	685 psi
fb =	739 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.31 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	0.59 < 1.0, Member OK
fb / (F'b(1-fc/Fce)) =	0.31 < 1.0, Member OK
Live Load defl ratio	
Total Load defl ratio	0.46 < 1.0, Member OK



# VisualAnalysis 3.50.c Report

07/12/01 14:38:43

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	Fix	DY	Fix	RZ
N1	0.00	0.00	Yes		Yes		No	
N2	11.00	0.00	No		No		"	
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	"	"	3.67
M9	"	"	5.39

## 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-	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	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
M9	-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



### BENDING & COMP: TRUSS 2 - MEMBER 3

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

#### Grading:

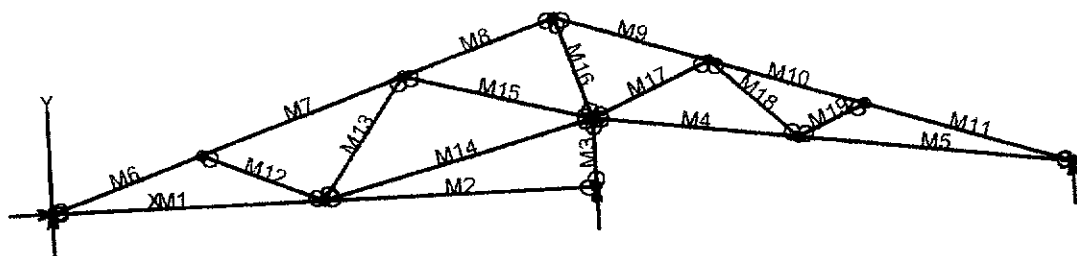
2x or 4x

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	
Total Load defl ratio	0.33 < 1.0, Member OK



# VisualAnalysis 3.50.c Report

07/12/01 14:44:25

Project: Truss 3

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
N1	0.00	0.00	Yes	Yes	No
N2	8.00	0.00	No	No	"
N3	16.00	0.00	"	Yes	"
N4	16.00	2.00	"	No	"
N5	22.00	1.14	"	"	"
N6	30.00	0.00	"	Yes	"
N7	4.50	1.50	"	No	"
N8	24.00	2.00	"	"	"
N9	10.50	3.50	"	"	"
N10	19.50	3.50	"	"	"
N11	15.00	5.00	"	"	"

## Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	8.00
M2	"	"	8.00
M3	"	"	2.00
M4	"	"	6.06
M5	"	"	8.08
M6	"	"	4.74
M7	"	"	6.32
M8	"	"	4.74
M9	"	"	4.74
M10	"	"	4.74
M11	"	"	6.32
M12	"	"	3.81
M13	"	"	4.30
M14	"	"	8.25
M15	"	"	5.70
M16	"	"	3.16
M17	"	"	3.81
M18	"	"	3.44
M19	"	"	2.18

## 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>
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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	360.03	-NA-
N3	"	-NA-	1341.93	-NA-
N6	"	-NA-	271.22	-NA-

## Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	711.99	-41.94	-60.33	-0.0343
"	711.99	-19.01	20.7838	-0.0532
"	711.99	3.9256	40.8932	-0.0507
"	711.99	26.8590	0.0000	-0.0000
M2	0.0000	-26.86	-0.0000	-0.0000
"	0.0000	-3.9256	40.8932	-0.0507
"	0.0000	19.0077	20.7838	-0.0532
"	0.0000	41.9410	-60.33	-0.0343
M3	-1315.07	0.0000	0.0000	-0.0077
"	-1315.07	0.0000	0.0000	-0.0055
"	-1315.07	0.0000	0.0000	-0.0034
"	-1315.07	0.0000	0.0000	-0.0012
M4	-350.32	-33.43	-46.24	-0.0333
"	-347.86	-16.23	3.8392	-0.0281
"	-345.39	0.9716	19.2519	-0.0220
"	-342.93	18.1716	0.0000	-0.0033
M5	520.73	-28.68	-0.0000	0.0007
"	524.00	-5.7447	46.2062	-0.0602
"	527.27	17.1886	30.7934	-0.0645
"	530.53	40.1220	-46.24	-0.0333
M6	-780.81	90.9234	0.0000	-0.0000
"	-753.71	9.6234	79.1679	-0.0381
"	-726.61	-71.68	30.1105	-0.0437
"	-699.51	-152.98	-147.17	-0.0399
M7	-347.45	159.97	-147.17	-0.0399
"	-311.31	51.5701	75.2396	-0.0817
"	-275.18	-56.83	69.6953	-0.0759
"	-239.05	-165.23	-163.80	-0.0270
M8	748.68	156.48	-163.80	-0.0270
"	775.78	75.1831	19.0219	-0.0331
"	802.88	-6.1169	73.6236	-0.0351
"	829.98	-87.42	0.0000	-0.0073
M9	1030.74	-144.48	-106.85	-0.0168
"	1057.84	-63.18	56.9899	-0.0412

"	1084.94	18.1234	92.6076	-0.0436
"	<b>1112.04</b>	99.4234	0.0000	-0.0071
M10	-120.17	-135.21	<b>-169.77</b>	-0.0397
"	-93.07	-53.91	-20.57	-0.0207
"	-65.97	27.3859	0.3999	-0.0164
"	-38.87	108.69	-106.85	-0.0168
M11	-592.92	-135.76	0.0000	0.0015
"	-556.79	-27.36	<b>171.37</b>	<b>-0.1249</b>
"	-520.66	81.0430	114.78	-0.1229
"	-484.52	<b>189.44</b>	-169.77	-0.0397
M12	-471.05	-0.0000	0.0000	-0.0329
"	-471.05	-0.0000	-0.0000	-0.0314
"	-471.05	-0.0000	-0.0000	-0.0300
"	-471.05	-0.0000	-0.0000	-0.0285
M13	298.73	-0.0000	0.0000	-0.0262
"	298.73	-0.0000	-0.0000	-0.0233
"	298.73	-0.0000	-0.0000	-0.0204
"	298.73	-0.0000	-0.0000	-0.0176
M14	108.64	0.0000	0.0000	-0.0351
"	108.64	0.0000	0.0000	-0.0247
"	108.64	0.0000	0.0000	-0.0142
"	108.64	0.0000	0.0000	-0.0037
M15	-896.73	-0.0000	0.0000	-0.0265
"	-896.73	-0.0000	-0.0000	-0.0187
"	-896.73	-0.0000	-0.0000	-0.0109
"	-896.73	-0.0000	-0.0000	-0.0031
M16	-834.18	0.0000	0.0000	-0.0000
"	-834.18	0.0000	0.0000	0.0007
"	-834.18	0.0000	0.0000	0.0014
"	-834.18	0.0000	0.0000	<b>0.0022</b>
M17	-741.45	0.0000	0.0000	-0.0188
"	-741.45	0.0000	0.0000	-0.0138
"	-741.45	0.0000	0.0000	-0.0088
"	-741.45	0.0000	0.0000	-0.0037
M18	568.34	0.0000	0.0000	-0.0279
"	568.34	0.0000	0.0000	-0.0223
"	568.34	0.0000	0.0000	-0.0168
"	568.34	0.0000	0.0000	-0.0112
M19	-488.01	0.0000	0.0000	-0.0356
"	-488.01	0.0000	0.0000	-0.0330
"	-488.01	0.0000	0.0000	-0.0304
"	-488.01	0.0000	0.0000	-0.0278

### BENDING & COMP: TRUSS 3 - MEMBER 11

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

#### Grading:

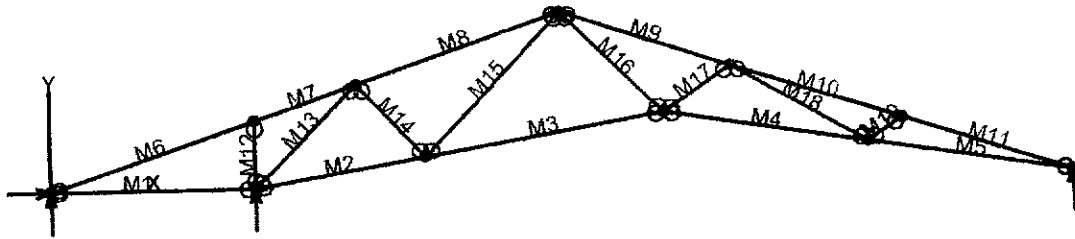
2x or 4x

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	484 feet
Max Reaction, R	189 feet
Max Moment, M	169 feet
Max LL Deflection	0.01 feet
Max TL Deflection	0.03 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 =	92 psi
Fce =	1275 psi
Fc* =	2084 psi
F'c =	1057 psi
fb =	662 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.45 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	
fb / (F'b(1-fc/Fce)) =	0.34 < 1.0, Member OK
Live Load defl ratio	0.03 < 1.0, Member OK
Total Load defl ratio	0.07 < 1.0, Member OK



# VisualAnalysis 3.50.c Report

07/12/01 14:50:24

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	6.00	0.00	No					
N3	11.00	0.83	"		No			
N4	18.00	2.00	"		"			
N5	24.00	1.00	"		"			
N6	30.00	0.00	"		Yes			
N7	6.00	2.00	"		No			
N8	9.00	3.00	"		"			
N9	15.00	5.00	"		"			
N10	20.00	3.33	"		"			
N11	25.00	1.67	"		"			

## Member Elements

Member	Section	Material	Length ft
M1	SS2x4	Wood	6.00
M2	"	"	5.07
M3	"	"	7.10
M4	"	"	6.08
M5	"	"	6.08
M6	"	"	6.32
M7	"	"	3.16
M8	"	"	6.32
M9	"	"	5.27
M10	"	"	5.27
M11	"	"	2.00
M12	"	"	4.24
M13	"	"	2.95
M14	"	"	5.78
M15	"	"	4.24
M16	"	"	2.40
M17	"	"	4.63
M18	"	"	1.20
M19	"	"	

## 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>



## 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	-433.56	-NA-
N2	"	-NA-	1775.85	-NA-
N6	"	-NA-	632.52	-NA-

## Member Results

Member	Axial lbs	Vy lbs	Mz lb-ft	Dy in
M1	-1785.94	-25.80	0.0000	-0.0000
"	-1785.94	-8.6000	34.3140	-0.0239
"	-1785.94	8.6000	34.3140	-0.0239
"	-1785.94	25.8000	0.0000	0.0000
M2	-442.43	13.3012	0.0000	0.0024
"	-440.04	-1.0322	10.3045	-0.0438
"	-437.66	-15.37	-3.5486	-0.0855
"	-435.27	-29.70	-41.56	-0.1302
M3	586.35	35.9562	-41.56	-0.1302
"	589.70	15.8895	19.6436	-0.2119
"	593.04	-4.1771	33.4967	-0.2769
"	596.39	-24.24	0.0000	-0.3106
M4	1901.10	-16.85	54.4283	-0.3572
"	1903.96	0.3480	71.0729	-0.3857
"	1906.83	17.5480	52.9301	-0.3611
"	1909.70	34.7480	0.0000	-0.2975
M5	2786.62	-34.75	0.0000	0.0214
"	2789.49	-17.55	52.9301	-0.1485
"	2792.35	-0.3480	71.0729	-0.2794
"	2795.22	16.8520	54.4283	-0.3572
M6	1839.55	128.97	0.0000	0.0000
"	1875.68	20.5732	157.06	-0.0987
"	1911.82	-87.83	86.1731	-0.0810
"	1947.95	-196.23	-212.67	-0.0063
M7	1849.12	100.25	-212.67	-0.0063
"	1867.19	46.0519	-135.71	-0.0078
"	1885.26	-8.1481	-115.73	-0.0389
"	1903.32	-62.35	-152.74	-0.0953
M8	-79.61	186.75	-152.74	-0.0953
"	-43.47	78.3508	126.13	-0.2537
"	-7.3402	-30.05	177.04	-0.3214
"	28.7931	-138.45	0.0000	-0.2559
M9	-1512.92	-162.87	-144.26	-0.3033
"	-1482.75	-72.53	62.1611	-0.3039

	-1452.58	17.8007	110.25	-0.2755
"	-1422.41	108.13	0.0000	-0.1903
M10	-2662.34	-114.26	-32.38	-0.3247
"	-2632.35	-23.93	88.5690	-0.3546
"	-2602.36	66.4037	51.2743	-0.3403
"	-2572.37	156.74	-144.26	-0.3036
M11	-2947.20	-129.36	0.0000	0.0412
"	-2917.03	-39.03	147.54	-0.1573
"	-2886.86	51.3083	136.75	-0.2771
"	-2856.68	141.64	-32.38	-0.3245
M12	-312.52	-0.0000	-0.0000	-0.0144
"	-312.52	-0.0000	-0.0000	-0.0039
"	-312.52	-0.0000	-0.0000	0.0067
"	-312.52	-0.0000	0.0000	0.0173
M13	-1911.60	-0.0000	-0.0000	-0.0102
"	-1911.60	-0.0000	-0.0000	0.0252
"	-1911.60	-0.0000	-0.0000	0.0606
"	-1911.60	-0.0000	0.0000	<b>0.0960</b>
M14	664.53	-0.0000	-0.0000	-0.0858
"	664.53	-0.0000	-0.0000	-0.0629
"	664.53	-0.0000	-0.0000	-0.0401
"	664.53	-0.0000	0.0000	-0.0172
M15	-819.95	0.0000	0.0000	-0.2376
"	-819.95	0.0000	0.0000	-0.1898
"	-819.95	0.0000	0.0000	-0.1419
"	-819.95	0.0000	0.0000	-0.0941
M16	1130.13	-0.0000	-0.0000	-0.1899
"	1130.13	-0.0000	-0.0000	-0.1576
"	1130.13	-0.0000	-0.0000	-0.1254
"	1130.13	-0.0000	0.0000	-0.0931
M17	-593.98	-0.0000	-0.0000	-0.3144
"	-593.98	-0.0000	-0.0000	-0.3025
"	-593.98	-0.0000	-0.0000	-0.2906
"	-593.98	-0.0000	0.0000	-0.2786
M18	709.10	0.0000	0.0000	-0.2967
"	709.10	0.0000	0.0000	-0.2857
"	709.10	0.0000	0.0000	-0.2748
"	709.10	0.0000	0.0000	-0.2639
M19	-317.41	-0.0000	0.0000	-0.3323
"	-317.41	-0.0000	-0.0000	-0.3256
"	-317.41	-0.0000	-0.0000	-0.3189
"	-317.41	-0.0000	-0.0000	-0.3122

### BENDING & COMP: TRUSS 4 - MEMBER 11

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	5.27 feet
Max Axial Comp, C	2856 feet
Max Reaction, R	141 feet
Max Moment, M	32 feet
Max LL Deflection	0.16 feet
Max TL Deflection	0.32 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 =	1.15
fc =	544 psi
Fce =	1789 psi
Fc* =	2084 psi
F'c =	1326 psi
fb =	125 psi
F'b = Fb* =	2156 psi
Shear D/C ratio	0.34 < 1.0, Member OK
Interaction equation: (fc/F'c) <sup>2</sup> +	
fb / (F'b(1-fc/Fce)) =	0.25 < 1.0, Member OK
Live Load defl ratio	0.61 < 1.0, Member OK
Total Load defl ratio	0.91 < 1.0, Member OK