

CITY OF SACRAMENTO

Permit No: 9804135

1231 I Street, Sacramento, CA 95814

Insp Area: 2

Site Address: 966 SUNWIND WY SAC

Sub-Type: RES

Parcel No: 0310700019

Housing (Y/N): N

CONTRACTOR

ZIMMERMAN ROOFING
3560 RAMONA AV
SACRAMENTO, CA

OWNER

HADLEY JOHN R/VIRGINIA D
966 SUNWIND WY
SACRAMENTO CA

ARCHITECT

95831

Nature of Work: T/O&REROOF 35SQS LT WT TILE(SOME FRAMING.SO SEE ATTACHMNT)

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 C39 License Number 557559 Date 5-22-98 Contractor Signature Lilly Coy

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

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

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

I am exempt under Sec. _____ B & PC for this reason: _____

Date 5-22-98 Owner Signature _____

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

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

Date 5-22-98 Applicant/Agent Signature Lilly Coy

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.

X 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 970002021

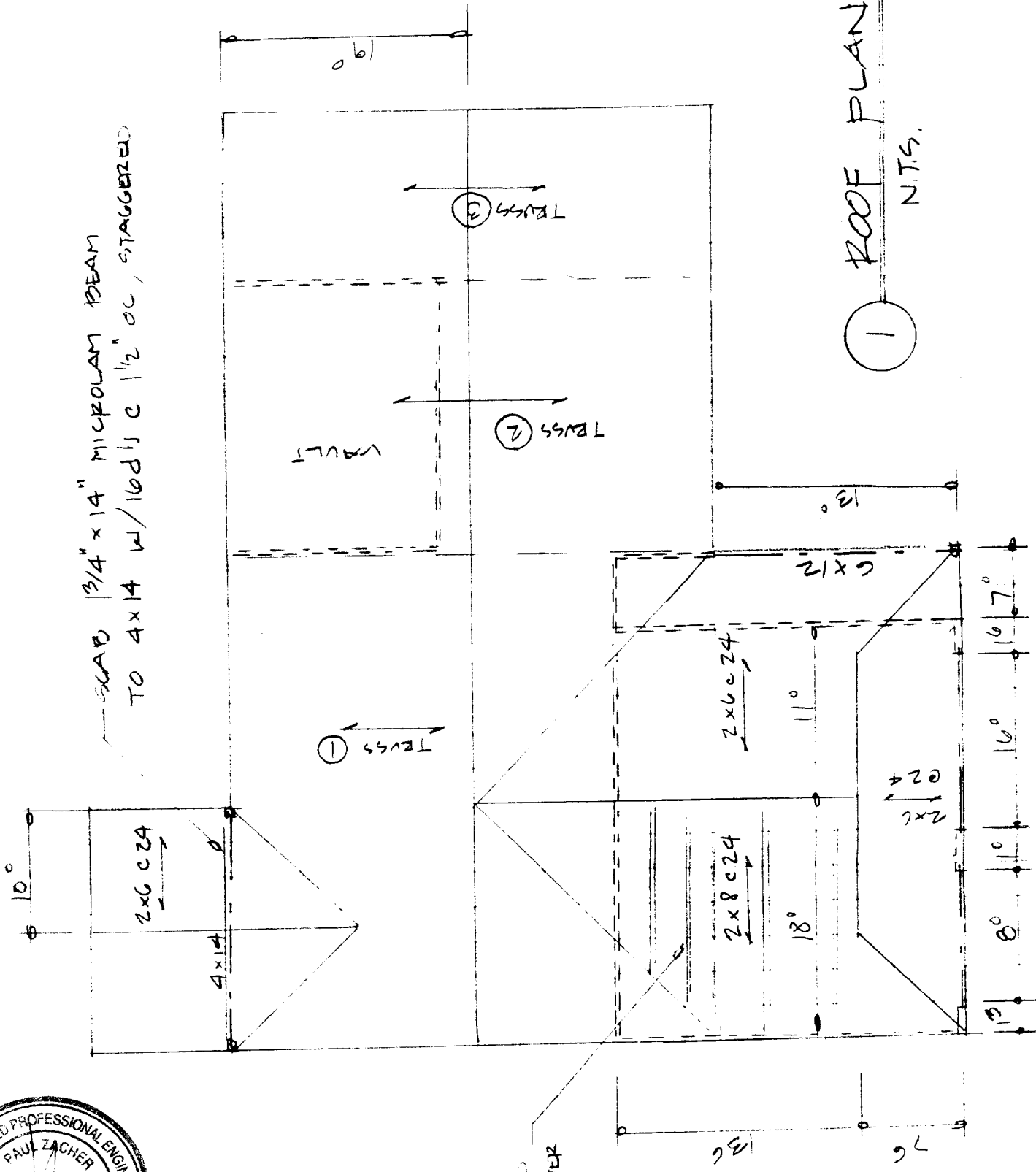
(This section need not be completed if the permit is for \$100 or less) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California and agree that if I should become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

Date 5-22-98 Applicant Signature Lilly Coy

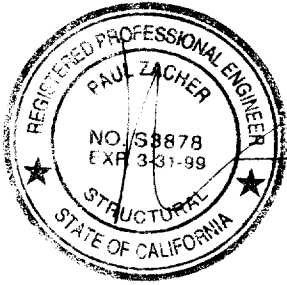
WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000) IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST AND ATTORNEY'S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

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

SCAB 3/4" x 14" MICROLAM BEAM
TO 4x14 W/16D/C 1/2" OC, STAGGERED



1 ROOF PLAN
N.T.S.



SCAB 2x8 TO
EXISTING RAFTER
(APPROX 7)



DEPARTMENT OF
PLANNING AND DEVELOPMENT

CITY OF SACRAMENTO
CALIFORNIA

1231 I STREET
ROOM 200
SACRAMENTO, CA
95814-2998
Permit Services
916-264-7619
FAX 916-264-7046

TILE ROOF WORKSHEET

This worksheet must be filled out whenever any type of tile roof is applied for.

If the answer to question #5 is yes, a written engineering report from a registered engineer must be provided with each application.

1. BRAND AND MODEL OF TILE Plyer - Haverdale
2. TILE WEIGHT PER SQUARE _____
3. WEIGHT OF ROOF SYSTEM PER SQUARE _____
4. TOTAL WEIGHT OF ROOF SYSTEM _____
5. DOES TOTAL WEIGHT OF ROOF SYSTEM EXCEED 750# PER SQUARE? YES NO
6. ROOF SLOPE 4/12

PLEASE PROVIDE A SEPARATE WORKSHEET FOR EACH APPLICATION INVOLVING A TILE ROOF

Paul Zacher-Structural Engineer
4701 Lakeside Way
Fair Oaks, CA 95628
TEL: 916.961.3960
FAX: 916.961.3960

May 12, 1998

Zimmerman Roofing
3560 Ramona Avenue
Sacramento, CA 95826
TEL: 916.454.3667
FAX: 916.455.3784
TEL (Jeff): 916.392.1971
FAX (Jeff): 916.392.6853
FAX (Framer): 916.383.5308

Attn.: Mr. Jeff Tucker,

re: Job 98077: HADLEY

Subject: Structural Investigation Report of the Roof for the Residence located at 966 Sunwind Way, 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 May 12, 1998. The investigation was made to determine the existing condition of the structure. All information, data and analysis contained within this report is based on the 1994 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 1800 square feet with a first story plate height of 8 feet.

CONSTRUCTION:

Roof:

The roof covering will consist of Pioneer Hacienda Light Weight Tile over 1/2" solid sheathing. The living and garage areas are framed with a combination of pre-engineered trusses spaced at 24" on center and conventional framing of 2x6 or 2x8 rafters spaced at 24" on center with 2x6 purlins supported at no more than 6'-0" on center by 2x4 struts bearing on walls below.

1/21

CONCLUSIONS:

Roof:

The living and garage areas lack sufficient structural capacity for the applied live and dead loads.

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 1 3/4" x 14" microlam beam to the existing 4x14 beam and nail both together with 16d's @ 1 1/2 " oc staggered. The top of the microlam may be "clipped" as required at the bearing wall. See detail 1.

Garage:

2. Scab a 2x8 rafter adjacent to the existing 2x8 rafters with 16d's @ 12" on center.

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 which 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>	
Pioneer Hacienda Light Wt	5.60	psf
Roofing felt	0.30	psf
1x4 skip sht'g	1.09	psf
1/2" OSB/ plywood	1.50	psf
2x6 rafters @ 24" oc	<u>1.00</u>	psf
	Load	9.5 psf
Roof Pitch Adjustment	<u>0.51</u>	psf
Total Load	10.0	psf

LOCATION: TOP CHORD

<u>MATERIAL</u>	<u>WEIGHT</u>	
Pioneer Hacienda Light Wt	5.60	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>1.28</u>	psf
	Load	9.8 psf
Roof Pitch Adjustment	<u>0.53</u>	psf
Total Load	10.3	psf

LOCATION: BOTTOM CHORD

<u>MATERIAL</u>	<u>WEIGHT</u>	
Batt/blown insul	0.50	psf
2x4 truss @ 24" oc	0.64	psf
1/2" Gypboard	<u>2.50</u>	psf
	Load	3.6 psf

BEAM DESIGN FOR UNIFORM LOAD: 2-2x8

(Values for DF Larch #2)

Width, b	3 inches
Depth, d	7.25 inches
Length of beam	18 feet
Dead load roof	10 psf
Live load roof	16 psf
Contributory width of roof load	2 feet
Dead load floor	0 psf
Live load floor	0 psf
Contributory width of floor load	0 feet
Dead load wall	0 plf
Live load defl ratio	240
Toal load defl ratio	180
Total dead load	20 plf
Total live load	32 plf

Base design values:

Shear, F_v	95 psi
Bending, F_b	875 psi
Comp. perp. to grain, F_c	625 psi
Mod of Elasticity, E	1600000 psi
Load duration factor, C_d	1.25
Size Factor, C_f	1.30
Repetitive factor, C_r	1.15

Dead load reaction	180 lbs
Live load reaction	288 lbs
Total load reaction	468 lbs

Allowable shear, F_v'	119 psi
Actual shear, f_v	30 psi
Allowable bending, F_b'	1635 psi
Actual bending, f_b	962 psi
Allowable live load defl	0.90 inches
Actual live load defl	0.50 inches
Allowable total load defl	1.20 inches
Actual total load defl	0.81 inches

Bearing length req'd 0.25 inches

Horizontal Shear OK

Bending OK

Live Load Deflection OK

Total Load Deflection OK

BEAM DESIGN FOR UNIFORM LOAD: 2x6

(Values for DF Larch #2)

Width, b	1.5 inches
Depth, d	5.5 inches
Length of beam	12.33 feet
Dead load roof	10 psf
Live load roof	16 psf
Contributory width of roof load	2 feet
Dead load floor	0 psf
Live load floor	0 psf
Contributory width of floor load	0 feet
Dead load wall	0 plf
Live load defl ratio	240
Total load defl ratio	180
Total dead load	20 plf
Total live load	32 plf
Base design values:	
Shear, Fv	95 psi
Bending, Fb	875 psi
Comp. perp. to grain, Fc	625 psi
Mod of Elasticity, E	1600000 psi
Load duration factor, Cd	1.25
Size Factor, Cf	1.30
Repetitive factor, Cr	1.15
Dead load reaction	123 lbs
Live load reaction	197 lbs
Total load reaction	321 lbs
Allowable shear, Fv'	119 psi
Actual shear, fv	54 psi
Allowable bending, Fb'	1635 psi
Actual bending, fb	1568 psi
Allowable live load defl	0.62 inches
Actual live load defl	0.50 inches
Allowable total load defl	0.82 inches
Actual total load defl	0.81 inches
Bearing length req'd	0.34 inches

Horizontal Shear OK

Bending OK

Live Load Deflection OK

Total Load Deflection OK

COMPOSITE DESIGN: WOOD MEMBER WITH WOOD SIDE PLATE

Main member.

Allow shear, $F_v = 9.5$ psi
 Allow bend, $F_b = 1000$ psi
 Mod of Elasticity = 17000000 psi

Side plate member.

Allow shear, $F_v = 285$ psi
 Allow bend, $F_b = 2600$ psi
 Mod of Elasticity = 18000000 psi

Max shear = 5227 lbs
 Max moment = 29450 ft-lbs

Load duration factor, $C_d = 1.25$

$I_v = 39.0$ psi
 $I_b, \text{ top} = 1894$ psi
 $I_b, \text{ bottom} = 1572$ psi

	Width (in)	Depth (in)	Area (in ²) (incl n value)	Y (in). Meas. from bottom up	ΣAY	lo_0 (in ⁴)	Ad^2	$lo_0 + Ad^2$
4x14	3.50	13.25	46.38	6.625	307.23	678.48	0.84	679.32
2X12	1.75	14.00	25.94	7.000	181.59	400.17	1.50	401.67
			72.32		488.82	1078.64	2.34	1080.98

$NA = \Sigma AY / \Sigma A = 6.76$ as measured from the bottom up

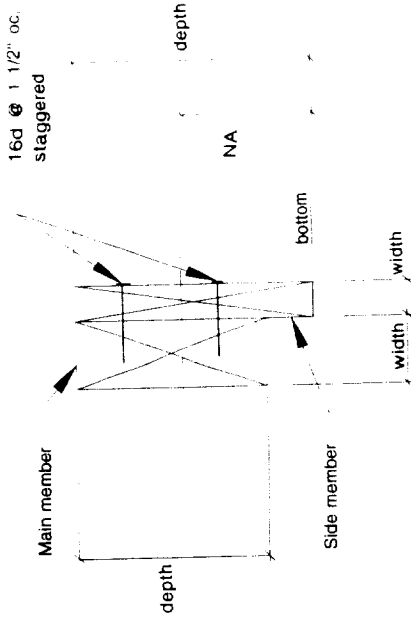
$S_{top} = 166.55$
 $S_{bottom} = 159.92$

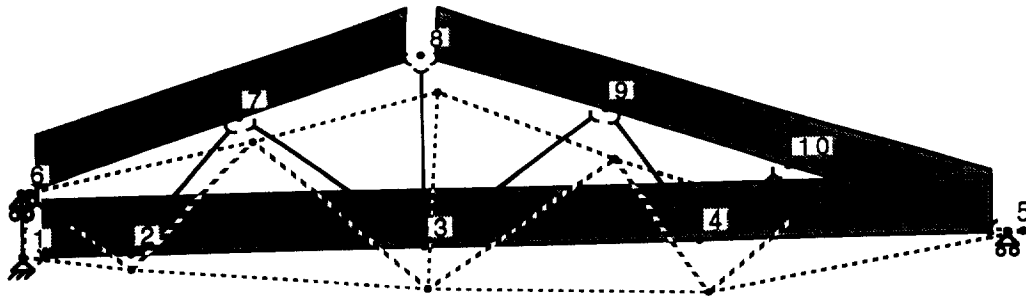
Y = the neutral axis of the member
 NA = combined neutral axis of the main member plus the side plate
 Static Moment, $Q = INA - Y$ of the side plate

Static Moment of Plate, Q	Y (in)	A (in ²)	Q (in ³)=YA
	0.24	25.94	6.24

Shear, V (lb)	End point	1/8 point	1/4 point	3/8 point	1/2 point
Horiz t (lb/in) = where $t = VQ/I$	5227	3920	2614	1307	0
	30	23	15	8	0

Therefore, nail the 1 3/4" X 14" LVL side plate to the existing 4x14 header with 16d commons at 1 1/2" oc staggered





Input Data

FRAME MAC file: truss1.
 Last modified at 1:18:31 AM on Wed, May 13, 1998.
 All coord. and distances are in ft.
 There are 10 nodes and 17 elements.
 There are 26 degrees of freedom; the half-bandwidth is 19.

Node information:

Node No.	Location ft (X)	Location ft (X) (Y)	Restraint (FX)	Restraint (FY)	Restraint (MZ)	Hinge
1	0.00	0.00	Yes	Yes	No	No
2	3.50	0.00	No	No	No	No
3	13.00	0.00	No	No	No	No
4	22.00	0.00	No	No	No	No
5	32.00	0.00	No	Yes	No	No
6	0.00	2.00	No	Yes	No	No
7	7.00	4.33	No	No	No	No
8	13.00	6.33	No	No	No	No
9	19.00	4.33	No	No	No	No
10	25.00	2.33	No	No	No	No

Element characteristics:

From, To Nodes	Length ft	Section name	E psi	Include self wt.	Top is on top or left	Hinged at node(s)
1,6	2.00	J2X4	1700000.00	No	Yes	---
1,2	3.50	J2X4	1700000.00	No	Yes	1
2,3	9.50	J2X4	1700000.00	No	Yes	---
2,6	4.03	J2X4	1700000.00	No	Yes	2,6
2,7	5.57	J2X4	1700000.00	No	Yes	2,7
3,4	9.00	J2X4	1700000.00	No	Yes	---
3,7	7.40	J2X4	1700000.00	No	Yes	3,7
3,8	6.33	J2X4	1700000.00	No	Yes	3,8
3,9	7.40	J2X4	1700000.00	No	Yes	3,9
4,5	10.00	J2X4	1700000.00	No	Yes	5
4,9	5.27	J2X4	1700000.00	No	Yes	4,9
4,10	3.80	J2X4	1700000.00	No	Yes	4,10
5,10	7.38	J2X4	1700000.00	No	Yes	5
6,7	7.38	J2X4	1700000.00	No	Yes	6
7,8	6.32	J2X4	1700000.00	No	Yes	8
8,9	6.32	J2X4	1700000.00	No	Yes	8
9,10	6.32	J2X4	1700000.00	No	Yes	---

Element characteristics (continued):

From, To Nodes	Area in**2	Depth in	Thickness in	Weight lb/ft	Weight lb
1,6	5.25	3.50	1.50	1.32	2.64
1,2	5.25	3.50	1.50	1.32	4.62
2,3	5.25	3.50	1.50	1.32	12.54
2,6	5.25	3.50	1.50	1.32	5.32
2,7	5.25	3.50	1.50	1.32	7.35
3,4	5.25	3.50	1.50	1.32	11.88
3,7	5.25	3.50	1.50	1.32	9.77
3,8	5.25	3.50	1.50	1.32	8.36
3,9	5.25	3.50	1.50	1.32	9.77
4,5	5.25	3.50	1.50	1.32	13.20
4,9	5.25	3.50	1.50	1.32	6.95
4,10	5.25	3.50	1.50	1.32	5.01
5,10	5.25	3.50	1.50	1.32	9.74
6,7	5.25	3.50	1.50	1.32	9.74

7,8	5.25	3.50	1.50	1.32	8.35
8,9	5.25	3.50	1.50	1.32	8.35
9,10	5.25	3.50	1.50	1.32	8.35

Element characteristics (continued):

From, To Nodes	Iz in**4	Sec. mod. in**3	Rad. gyr. in	N.A.-edge in	S, T, L
1,6	5.36	3.06	1.01	1.75	S
1,2	5.36	3.06	1.01	1.75	S
2,3	5.36	3.06	1.01	1.75	S
2,6	5.36	3.06	1.01	1.75	S
2,7	5.36	3.06	1.01	1.75	S
3,4	5.36	3.06	1.01	1.75	S
3,7	5.36	3.06	1.01	1.75	S
3,8	5.36	3.06	1.01	1.75	S
3,9	5.36	3.06	1.01	1.75	S
4,5	5.36	3.06	1.01	1.75	S
4,9	5.36	3.06	1.01	1.75	S
4,10	5.36	3.06	1.01	1.75	S
5,10	5.36	3.06	1.01	1.75	S
6,7	5.36	3.06	1.01	1.75	S
7,8	5.36	3.06	1.01	1.75	S
8,9	5.36	3.06	1.01	1.75	S
9,10	5.36	3.06	1.01	1.75	S

Total frame weight: 141.93 lb.

Element loads (only those that are in applied groups are listed):

From, To Nodes	Group	From 1st ft	Dist. Len/ lb-ft	MagX, L lb (FX)	MagY, L lb (FY)	MagX, R lb (FX)	MagY, R lb (FY)
1,2	Dead 1	0.00	3.50	0.00	7.20	0.00	7.20
2,3	Dead 1	0.00	9.50	0.00	7.20	0.00	7.20
3,4	Dead 1	0.00	9.00	0.00	7.20	0.00	7.20
4,5	Dead 1	0.00	10.00	0.00	7.20	0.00	7.20
5,10	Dead 1	0.00	7.38	0.00	20.60	0.00	20.60
5,10	Live 1	0.00	7.38	0.00	32.00	0.00	32.00
6,7	Dead 1	0.00	7.38	0.00	20.60	0.00	20.60
6,7	Live 1	0.00	7.38	0.00	32.00	0.00	32.00
7,8	Dead 1	0.00	6.32	0.00	20.60	0.00	20.60
7,8	Live 1	0.00	6.32	0.00	32.00	0.00	32.00
8,9	Dead 1	0.00	6.32	0.00	20.60	0.00	20.60
8,9	Live 1	0.00	6.32	0.00	32.00	0.00	32.00
9,10	Dead 1	0.00	6.32	0.00	20.60	0.00	20.60
9,10	Live 1	0.00	6.32	0.00	32.00	0.00	32.00

General load factor: 1.000

Load factors (suffix denotes whether the group is currently applied):

Group	Dead	Live	Wind	Snow	Misc.
1	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
2	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
3	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
4	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
5	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y

Output Data

FRAME MAC file: truss1.

Last modified at 1:18:31 AM on Wed, May 13, 1998.

All coord. and distances are in ft from the left (bot.) end of the element.

Support reactions: (pos. force is to right or up; pos. moment is ccw.)

Node No.	Reaction lb (FX)	Reaction lb (FY)	Reaction lb-ft (MZ)
1	0.00	2.50	---
5	---	1002.27	---
6	---	999.77	---

Node deformations: (positive is to right, up, or counterclockwise.)

Node No.	Deflection inch (FX)	Deflection inch (FY)	Rotation radians (MZ)
1	0.00	0.00	-0.00
2	0.00	-0.07	-0.00
3	0.02	-0.18	-0.00
4	0.04	-0.24	-0.00
5	0.07	0.00	---
6	0.03	0.00	-0.00
7	0.06	-0.12	0.00
8	0.07	-0.18	---
9	0.04	-0.23	0.00
10	0.02	-0.22	-0.00

Maximum tension and tensile stress values (compression is negative):

From, To Node	Maximum tension lb	Minimum tension lb	Max. abs. tension lb	Maximum ten. str. psi	Minimum ten. str. psi	Max. abs. stress psi
1,6	0.00	0.00	0.00	0.00	0.00	0.00
1,2	0.00	0.00	0.00	0.00	0.00	0.00
2,3	1324.52	0.00	1324.52	252.29	0.00	252.29
2,6	1078.69	0.00	1078.69	205.46	0.00	205.46
2,7	0.00	-617.15	-617.15	0.00	-117.55	-117.55
3,4	1824.74	0.00	1824.74	347.57	0.00	347.57
3,7	0.00	-116.20	-116.20	0.00	-22.13	-22.13
3,8	565.92	0.00	565.92	107.79	0.00	107.79
3,9	0.00	-733.07	-733.07	0.00	-139.63	-139.63
4,5	2428.73	0.00	2428.73	462.62	0.00	462.62
4,9	428.21	0.00	428.21	81.56	0.00	81.56
4,10	0.00	-455.99	-455.99	0.00	-86.85	-86.85
5,10	0.00	-2611.03	-2611.03	0.00	-497.34	-497.34
6,7	0.00	-1035.35	-1035.35	0.00	-197.21	-197.21
7,8	0.00	-1364.64	-1364.64	0.00	-259.93	-259.93
8,9	0.00	-1359.04	-1359.04	0.00	-258.87	-258.87
9,10	0.00	-2235.18	-2235.18	0.00	-425.75	-425.75

Maximum shear and shear stress values:

From, To Node	Maximum shear lb	Minimum shear lb	Max. abs. shear lb	Maximum shr. str. psi	Minimum shr. str. psi	Max. abs. stress psi
1,6	0.00	0.00	0.00	0.00	0.00	0.00
1,2	2.50	-22.70	-22.70	0.48	-4.32	-4.32
2,3	32.52	-35.88	-35.88	6.19	-6.83	-6.83
2,6	0.00	0.00	0.00	0.00	0.00	0.00
2,7	0.00	0.00	0.00	0.00	0.00	0.00
3,4	33.06	-31.74	33.06	6.30	-6.05	6.30

3,7	0.00	0.00	0.00	0.00	0.00	0.00
3,8	0.00	0.00	0.00	0.00	0.00	0.00
3,9	0.00	0.00	0.00	0.00	0.00	0.00
4,5	40.54	-31.46	40.54	7.72	-5.99	7.72
4,9	0.00	0.00	0.00	0.00	0.00	0.00
4,10	0.00	0.00	0.00	0.00	0.00	0.00
5,10	214.12	-154.08	214.12	40.79	-29.35	40.79
6,7	145.02	-223.18	-223.18	27.62	-42.51	-42.51
7,8	203.38	-112.22	203.38	38.74	-21.37	38.74
8,9	129.01	-186.59	-186.59	24.57	-35.54	-35.54
9,10	151.56	-164.04	-164.04	28.87	-31.25	-31.25

 Maximum moment and bending stress values:

From, To Node	Maximum moment lb-ft	Minimum moment lb-ft	Max. abs. moment lb-ft	Maximum ben. str. psi	Minimum ben. str. psi	Max. abs. stress psi
1,6	0.00	0.00	0.00	0.00	0.00	0.00
1,2	0.43	-35.34	-35.34	1.71	-138.60	-138.60
2,3	38.10	-51.30	-51.30	149.41	-201.17	-201.17
2,6	0.00	0.00	0.00	0.00	0.00	0.00
2,7	0.00	0.00	0.00	0.00	0.00	0.00
2,7	0.00	0.00	0.00	96.41	-201.17	-201.17
3,4	24.59	-51.30	-51.30	0.00	0.00	0.00
3,7	0.00	0.00	0.00	0.00	0.00	0.00
3,8	0.00	0.00	0.00	0.00	0.00	0.00
3,9	0.00	0.00	0.00	0.00	0.00	0.00
3,9	0.00	0.00	0.00	269.55	-178.00	269.55
4,5	68.74	-45.39	68.74	0.00	0.00	0.00
4,9	0.00	0.00	0.00	0.00	0.00	0.00
4,10	0.00	0.00	0.00	0.00	0.00	0.00
4,10	0.00	0.00	0.00	0.00	0.00	0.00
5,10	237.83	-221.51	237.83	932.67	-868.66	932.67
6,7	210.71	-288.29	-288.29	826.30	-1130.55	-1130.55
7,8	126.18	-288.29	-288.29	494.81	-1130.55	-1130.55
8,9	166.78	-182.06	-182.06	654.03	-713.95	-713.95
9,10	48.11	-221.51	-221.51	188.67	-868.66	-868.66

 Maximum deflection values:

From, To Node	Maximum defl. up (left) inch	Maximum defl. down (rt.) inch	Maximum defl. absolute inch
1,6	0.00	-0.03	-0.03
1,2	0.00	-0.07	-0.07
2,3	0.00	-0.19	-0.19
2,3	0.00	-0.06	-0.06
2,6	0.02	-0.13	-0.13
2,7	0.00	-0.24	-0.24
3,4	0.00	-0.14	-0.14
3,7	0.00	-0.07	-0.07
3,8	0.00	-0.21	-0.21
3,9	0.00	-0.26	-0.26
4,5	0.00	-0.10	-0.10
4,9	0.00	-0.21	-0.21
4,10	0.00	-0.31	-0.31
5,10	0.02	-0.25	-0.25
6,7	0.00	-0.24	-0.24
7,8	0.00	-0.29	-0.29
8,9	0.00	-0.21	-0.21
9,10	0.00	-0.21	-0.21

BENDING & COMP: TRUSS 1; MEMBER 5-10Grading:

2x or 4x

Doug-fir larch: No. 2

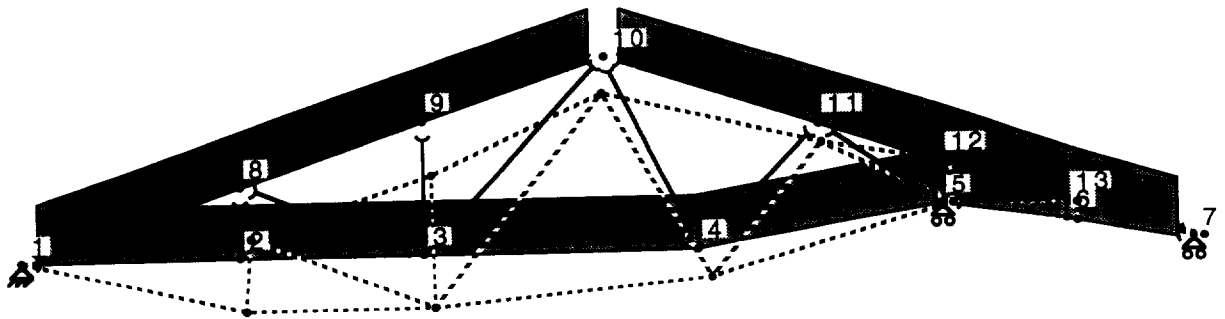
Assumptions:

Lateral support at points of bearing

SPS or gypboard attached to 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	2611 lbs
Max Reaction, R	214 lbs
Max Moment, M	238 ft-lbs
Max LL Deflection	0.19 inches
Max TL Deflection	0.31 inches
LL Defl Criteria = L/	240
TL Defl Criteria = L/	180
Duration factor, Cd	1.25
Repetitive Factor, Cr	1.15
fc =	497 psi
Fce=	1171 psi
Fc*=	1094 psi
F'c=	781 psi
fb=	78 psi
F'b=	1258 psi
Shear D/C ratio	0.51 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	
fb/ (F'b(1-fc/Fce)) =	0.51 < 1.0, Member OK
Live Load defl ratio	0.51 < 1.0, Member OK
Total Load defl ratio	0.63 < 1.0, Member OK



Input Data

FRAME MAC file: truss2.
 Last modified at 1:41:56 AM on Wed, May 13, 1998.
 All coord. and distances are in ft.
 There are 13 nodes and 23 elements.
 There are 35 degrees of freedom; the half-bandwidth is 25.

Node information:

Node No.	Location ft (X)	Location ft (X) (Y)	Restraint (FX)	Restraint (FY)	Restraint (MZ)	Hinge
1	0.00	0.00	Yes	Yes	No	No
2	7.00	0.00	No	No	No	No
3	13.00	0.00	No	No	No	No
4	22.00	0.00	No	No	No	No
5	30.00	1.33	No	Yes	No	No
6	34.00	0.67	No	No	No	No
7	38.00	0.00	No	Yes	No	No
8	7.00	2.33	No	No	No	No
9	13.00	4.33	No	No	No	No
10	19.00	6.33	No	No	No	No
11	26.00	4.00	No	No	No	No
12	30.00	2.67	No	No	No	No
13	34.00	1.33	No	No	No	No

Element characteristics:

From, To Nodes	Length ft	Section name	E psi	Include self wt.	Top is on top or left	Hinged at node(s)
1,8	7.38	J2X4	1700000.00	No	Yes	1
1,2	7.00	J2X4	1700000.00	No	Yes	1
2,3	6.00	J2X4	1700000.00	No	Yes	---
2,8	2.33	J2X4	1700000.00	No	Yes	2,8
3,4	9.00	J2X4	1700000.00	No	Yes	---
3,8	6.44	J2X4	1700000.00	No	Yes	3,8
3,9	4.33	J2X4	1700000.00	No	Yes	3,9
3,10	8.72	J2X4	1700000.00	No	Yes	3,10
4,5	8.11	J2X4	1700000.00	No	Yes	---
4,10	7.00	J2X4	1700000.00	No	Yes	4,10
4,11	5.66	J2X4	1700000.00	No	Yes	4,11
5,6	4.05	J2X4	1700000.00	No	Yes	---
5,11	4.81	J2X4	1700000.00	No	Yes	5,11
5,12	1.34	J2X4	1700000.00	No	Yes	5,12
5,13	4.00	J2X4	1700000.00	No	Yes	5,13
6,7	4.06	J2X4	1700000.00	No	Yes	7
6,13	0.66	J2X4	1700000.00	No	Yes	---
7,13	4.22	J2X4	1700000.00	No	Yes	7
8,9	6.32	J2X4	1700000.00	No	Yes	---
9,10	6.32	J2X4	1700000.00	No	Yes	10
10,11	7.38	J2X4	1700000.00	No	Yes	10
11,12	4.22	J2X4	1700000.00	No	Yes	---
12,13	4.22	J2X4	1700000.00	No	Yes	---

Element characteristics (continued):

From, To Nodes	Area in**2	Depth in	Thickness in	Weight lb/ft	Weight lb
1,8	5.25	3.50	1.50	1.32	9.74
1,2	5.25	3.50	1.50	1.32	9.24
2,3	5.25	3.50	1.50	1.32	7.92
2,8	5.25	3.50	1.50	1.32	3.08
3,4	5.25	3.50	1.50	1.32	11.88

3,8	5.25	3.50	1.50	1.32	8.50
3,9	5.25	3.50	1.50	1.32	5.72
3,10	5.25	3.50	1.50	1.32	11.51
4,5	5.25	3.50	1.50	1.32	10.70
4,10	5.25	3.50	1.50	1.32	9.25
4,11	5.25	3.50	1.50	1.32	7.47
5,6	5.25	3.50	1.50	1.32	5.35
5,11	5.25	3.50	1.50	1.32	6.35
5,12	5.25	3.50	1.50	1.32	1.77
5,13	5.25	3.50	1.50	1.32	5.28
6,7	5.25	3.50	1.50	1.32	5.35
6,13	5.25	3.50	1.50	1.32	0.87
7,13	5.25	3.50	1.50	1.32	5.56
8,9	5.25	3.50	1.50	1.32	8.35
9,10	5.25	3.50	1.50	1.32	8.35
10,11	5.25	3.50	1.50	1.32	9.74
11,12	5.25	3.50	1.50	1.32	5.56
12,13	5.25	3.50	1.50	1.32	5.57

Element characteristics (continued):

From, To Nodes	Iz in**4	Sec. mod. in**3	Rad. gyr. in	N.A.-edge in	S,T,L
1,8	5.36	3.06	1.01	1.75	S
1,2	5.36	3.06	1.01	1.75	S
2,3	5.36	3.06	1.01	1.75	S
2,8	5.36	3.06	1.01	1.75	S
3,4	5.36	3.06	1.01	1.75	S
3,8	5.36	3.06	1.01	1.75	S
3,9	5.36	3.06	1.01	1.75	S
3,10	5.36	3.06	1.01	1.75	S
4,5	5.36	3.06	1.01	1.75	S
4,10	5.36	3.06	1.01	1.75	S
4,11	5.36	3.06	1.01	1.75	S
5,6	5.36	3.06	1.01	1.75	S
5,11	5.36	3.06	1.01	1.75	S
5,12	5.36	3.06	1.01	1.75	S
5,13	5.36	3.06	1.01	1.75	S
6,7	5.36	3.06	1.01	1.75	S
6,13	5.36	3.06	1.01	1.75	S
7,13	5.36	3.06	1.01	1.75	S
8,9	5.36	3.06	1.01	1.75	S
9,10	5.36	3.06	1.01	1.75	S
10,11	5.36	3.06	1.01	1.75	S
11,12	5.36	3.06	1.01	1.75	S
12,13	5.36	3.06	1.01	1.75	S

Total frame weight: 163.10 lb.

Element loads (only those that are in applied groups are listed):

From, To Nodes	Group	From 1st ft	Dist. Len/ lb-ft	MagX,L lb (FX)	MagY,L lb (FY)	MagX,R lb (FX)	MagY,R lb (FY)
1,8	Dead 1	0.00	7.38	0.00	20.60	0.00	20.60
1,8	Live 1	0.00	7.38	0.00	32.00	0.00	32.00
1,2	Dead 1	0.00	7.00	0.00	7.20	0.00	7.20
2,3	Dead 1	0.00	6.00	0.00	7.20	0.00	7.20
3,4	Dead 1	0.00	9.00	0.00	7.20	0.00	7.20
4,5	Dead 1	0.00	8.11	0.00	7.20	0.00	7.20
5,6	Dead 1	0.00	4.05	0.00	7.20	0.00	7.20
6,7	Dead 1	0.00	4.06	0.00	7.20	0.00	7.20
7,13	Dead 1	0.00	4.22	0.00	20.60	0.00	20.60
7,13	Live 1	0.00	4.22	0.00	32.00	0.00	32.00
8,9	Dead 1	0.00	6.32	0.00	20.60	0.00	20.60

8,9	Live 1	0.00	6.32	0.00	32.00	0.00	32.00
9,10	Dead 1	0.00	6.32	0.00	20.60	0.00	20.60
9,10	Live 1	0.00	6.32	0.00	32.00	0.00	32.00
10,11	Dead 1	0.00	7.38	0.00	20.60	0.00	20.60
10,11	Live 1	0.00	7.38	0.00	32.00	0.00	32.00
11,12	Dead 1	0.00	4.22	0.00	20.60	0.00	20.60
11,12	Live 1	0.00	4.22	0.00	32.00	0.00	32.00
12,13	Dead 1	0.00	4.22	0.00	20.60	0.00	20.60
12,13	Live 1	0.00	4.22	0.00	32.00	0.00	32.00

General load factor: 1.000

Load factors (suffix denotes whether the group is currently applied):

Group	Dead	Live	Wind	Snow	Misc.
1	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
2	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
3	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
4	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y
5	1.000Y	1.000Y	1.000Y	1.000Y	1.000Y

Output Data

FRAME MAC file: truss2.

Last modified at 1:41:56 AM on Wed, May 13, 1998.

All coord. and distances are in ft from the left (bot.) end of the element.

Support reactions: (pos. force is to right or up; pos. moment is ccw.)

Node No.	Reaction lb (FX)	Reaction lb (FY)	Reaction lb-ft (MZ)
1	0.00	902.24	---
5	---	1369.30	---
7	---	110.44	---

Node deformations: (positive is to right, up, or counterclockwise.)

Node No.	Deflection inch (FX)	Deflection inch (FY)	Rotation radians (MZ)
1	0.00	0.00	---
2	0.02	-0.20	-0.00
3	0.04	-0.19	-0.00
4	0.05	-0.11	0.00
5	0.04	0.00	0.00
6	0.04	-0.01	0.00
7	0.04	0.00	---
8	0.04	-0.20	0.00
9	0.03	-0.20	-0.00
10	-0.01	-0.14	---
11	0.01	-0.07	0.00
12	0.03	-0.00	-0.00
13	0.03	-0.01	0.00

Maximum tension and tensile stress values (compression is negative):

From, To Node	Maximum tension lb	Minimum tension lb	Max. abs. tension lb	Maximum ten. str. psi	Minimum ten. str. psi	Max. abs. stress psi
1,8	0.00	-2312.76	-2312.76	0.00	-440.53	-440.53
1,2	2145.82	0.00	2145.82	408.73	0.00	408.73
2,3	2145.82	0.00	2145.82	408.73	0.00	408.73
2,8	39.16	0.00	39.16	7.46	0.00	7.46
3,4	917.73	0.00	917.73	174.81	0.00	174.81
3,8	0.00	-653.26	-653.26	0.00	-124.43	-124.43
3,9	0.00	-355.97	-355.97	0.00	-67.80	-67.80
3,10	899.98	0.00	899.98	171.42	0.00	171.42
4,5	767.34	0.00	767.34	146.16	0.00	146.16
4,10	0.00	-173.84	-173.84	0.00	-33.11	-33.11
4,11	129.34	0.00	129.34	24.64	0.00	24.64
5,6	0.00	-49.70	-49.70	0.00	-9.47	-9.47
5,11	0.00	-1792.54	-1792.54	0.00	-341.44	-341.44
5,12	0.00	-188.61	-188.61	0.00	-35.93	-35.93
5,13	0.00	-688.76	-688.76	0.00	-131.19	-131.19
6,7	78.10	0.00	78.10	14.88	0.00	14.88
6,13	29.05	0.00	29.05	5.53	0.00	5.53
7,13	0.00	-105.27	-105.27	0.00	-20.05	-20.05
8,9	0.00	-1674.80	-1674.80	0.00	-319.01	-319.01
9,10	0.00	-1682.17	-1682.17	0.00	-320.41	-320.41
10,11	0.00	-960.54	-960.54	0.00	-182.96	-182.96
11,12	826.21	0.00	826.21	157.37	0.00	157.37
12,13	816.01	0.00	816.01	155.43	0.00	155.43

Maximum shear and shear stress values:

From, To	Maximum	Minimum	Max. abs.	Maximum	Minimum	Max. abs.
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Node ---	shear lb	shear lb	shear lb	shr. str. psi	shr. str. psi	stress psi
1,8	153.80	-214.40	-214.40	29.30	-40.84	-40.84
1,2	25.90	-24.50	25.90	4.93	-4.67	4.93
2,3	14.66	-28.54	-28.54	2.79	-5.44	-5.44
2,8	0.00	0.00	0.00	0.00	0.00	0.00
3,4	32.19	-32.61	-32.61	6.13	-6.21	-6.21
3,8	0.00	0.00	0.00	0.00	0.00	0.00
3,9	0.00	0.00	0.00	0.00	0.00	0.00
3,10	0.00	0.00	0.00	0.00	0.00	0.00
4,5	26.39	-31.21	-31.21	5.03	-5.95	-5.95
4,10	0.00	0.00	0.00	0.00	0.00	0.00
4,11	0.00	0.00	0.00	0.00	0.00	0.00
5,6	36.68	0.00	36.68	6.99	0.00	6.99
5,11	0.00	0.00	0.00	0.00	0.00	0.00
5,12	0.00	0.00	0.00	0.00	0.00	0.00
5,13	0.00	0.00	0.00	0.00	0.00	0.00
6,7	16.06	-12.74	16.06	3.06	-2.43	3.06
6,13	0.00	-124.68	-124.68	0.00	-23.75	-23.75
7,13	129.50	-80.90	129.50	24.67	-15.41	24.67
8,9	164.42	-151.18	164.42	31.32	-28.80	31.32
9,10	186.52	-129.08	186.52	35.53	-24.59	35.53
10,11	152.60	-215.60	-215.60	29.07	-41.07	-41.07
11,12	142.39	-68.01	142.39	27.12	-12.95	27.12
12,13	109.14	-101.26	109.14	20.79	-19.29	20.79

Maximum moment and bending stress values:

From, To Node ---	Maximum moment lb-ft	Minimum moment lb-ft	Max. abs. moment lb-ft	Maximum ben. str. psi	Minimum ben. str. psi	Max. abs. stress psi
1,8	236.98	-223.54	236.98	929.35	-876.61	929.35
1,2	46.57	0.00	46.57	182.64	0.00	182.64
2,3	19.80	-36.77	-36.77	77.65	-144.20	-144.20
2,8	0.00	0.00	0.00	0.00	0.00	0.00
3,4	35.20	-38.64	-38.64	138.04	-151.51	-151.51
3,8	0.00	0.00	0.00	0.00	0.00	0.00
3,9	0.00	0.00	0.00	0.00	0.00	0.00
3,10	0.00	0.00	0.00	0.00	0.00	0.00
4,5	10.37	-58.22	-58.22	40.68	-228.31	-228.31
4,10	0.00	0.00	0.00	0.00	0.00	0.00
4,11	0.00	0.00	0.00	0.00	0.00	0.00
5,6	32.12	-58.22	-58.22	125.96	-228.31	-228.31
5,11	0.00	0.00	0.00	0.00	0.00	0.00
5,12	0.00	0.00	0.00	0.00	0.00	0.00
5,13	0.00	0.00	0.00	0.00	0.00	0.00
6,7	11.43	-6.74	11.43	44.81	-26.43	44.81
6,13	38.86	-43.43	-43.43	152.39	-170.32	-170.32
7,13	65.56	-102.43	-102.43	257.11	-401.69	-401.69
8,9	47.35	-223.54	-223.54	185.68	-876.61	-876.61
9,10	166.94	-181.65	-181.65	654.68	-712.37	-712.37
10,11	233.30	-232.39	233.30	914.90	-911.34	914.90
11,12	0.00	-232.39	-232.39	0.00	-911.34	-911.34
12,13	43.80	-75.60	-75.60	171.76	-296.49	-296.49

Maximum deflection values:

From, To Node ---	Maximum defl. up (left) inch	Maximum defl. down (rt.) inch	Maximum defl. absolute inch
1,8	0.00	-0.32	-0.32
1,2	0.00	-0.20	-0.20
2,3	0.00	-0.21	-0.21

2,8	0.00	-0.04	-0.04
3,4	0.00	-0.20	-0.20
3,8	0.00	-0.17	-0.17
3,9	0.00	-0.04	-0.04
3,10	0.00	-0.16	-0.16
4,5	0.00	-0.12	-0.12
4,10	0.00	-0.07	-0.07
4,11	0.00	-0.11	-0.11
5,6	0.01	-0.01	0.01
5,11	0.02	-0.05	-0.05
5,12	0.00	-0.04	-0.04
5,13	0.00	-0.01	-0.01
6,7	0.01	-0.01	-0.01
6,13	0.00	-0.04	-0.04
7,13	0.01	-0.01	0.01
8,9	0.00	-0.20	-0.20
9,10	0.00	-0.27	-0.27
10,11	0.00	-0.32	-0.32
11,12	0.01	-0.06	-0.06
12,13	0.01	-0.01	0.01

BENDING & COMP: TRUSS 2; MEMBER 1-8Grading:

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

Assumptions:

Lateral support at points of bearing

SPS or gypboard attached to 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	2313 lbs
Max Reaction, R	214 lbs
Max Moment, M	237 ft-lbs
Max LL Deflection	0.19 inches
Max TL Deflection	0.32 inches
LL Defl Criteria = L/	240
TL Defl Criteria = L/	180
Duration factor, Cd	1.25
Repetitive Factor, Cr	1.15
fc =	441 psi
Fce=	1171 psi
Fc*=	1094 psi
F'c=	781 psi
fb=	77 psi
F'b=	1258 psi
Shear D/C ratio	0.51 < 1.0, Member OK
Interaction equation:	
(fc/F'c)^2 +	
fb/ (F'b(1-fc/Fce)) =	0.42 < 1.0, Member OK
Live Load defl ratio	0.51 < 1.0, Member OK
Total Load defl ratio	0.65 < 1.0, Member OK