

CITY OF SACRAMENTO

1231 I Street, Sacramento, CA 95814

Permit No: 0401857

Insp Area: 2

Thos Bros: 336J2

Site Address: 9 WINTERMIST CT SAC

Parcel No: 031-0630-016

Sub-Type: RES

Housing (Y/N): N

CONTRACTOR
CRUZ ROOFING
170 VISTA CREEK CIR
SAC CA 95835

OWNER
BILL JUANG
9 WINTERMIST CT
SACRAMENTO CA 95831

ARCHITECT

Nature of Work: T/O R/R 28 SQW/ WLITE WT CLAY TILE, SEE ENGINEERING.

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 CR License Number 795408 Date 2/16/04 Contractor Signature Susan Cruz

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

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

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

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

Date _____ Owner Signature _____

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

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

Date 2/16/04 Applicant/Agent Signature Susan Cruz

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 NO EMPLOYEES Policy Number _____

(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 2/16/04 Applicant Signature Susan Cruz

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.

PAID
CITY OF SACRAMENTO
FEB 06 2004
NORTH PERMIT
OFFICE

ROOFING QUESTIONNAIRE

Applicant's name: Susan Cruz Phone: 419 9658

Project Address: 9 Wintermist Ct Sac CA

Please check the appropriate boxes. Only check a box if it accurately and completely describes your proposed work, otherwise leave boxes blank.

1. ROOFING TYPE

a. The existing roofing material is composition shingle, wood shake or shingle, tile or metal. The new roofing material shall be:

| Existing | Proposed | |
|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 25 year laminated dimensional composition |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | wood shake or shingle |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | tile |
| <input type="checkbox"/> | <input type="checkbox"/> | metal that simulates one of the above listed materials |

b. The existing roofing material is built up, foam or membrane with a roof pitch of 2:12 or less. The new roofing material shall be:

| Existing | Proposed | |
|--------------------------|--------------------------|----------|
| <input type="checkbox"/> | <input type="checkbox"/> | Built up |
| <input type="checkbox"/> | <input type="checkbox"/> | Foam |
| <input type="checkbox"/> | <input type="checkbox"/> | Membrane |

2. GUTTERS

a. The existing gutters are fascia gutters.
 There is no change proposed to existing gutters.
 New fascia gutters shall be provided.
 Gutters shall be repaired and/or replaced to match existing.

b. The existing gutters are Ogee gutters.
 There is no change proposed to existing gutters.
 New Ogee gutters shall be provided.
 Gutters shall be repaired and/or replaced to match existing.

c. There are no existing gutters.
 No new gutters are proposed.
 New Ogee gutters shall be provided.

3. RAFTER TAILS

a. There are no exposed rafter tails.

b. There are exposed rafter tails.
 There is no change or cutting proposed to existing rafter tails.
 Rafter tails shall be repaired and replaced to match existing.

By signing below, the applicant certifies that this form accurately describes the proposed work.

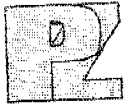
Applicant's signature: Susan Cruz Date: 2/6/04

For City Staff use only

Counter Staff [Signature]

- In a DR District Meets DR criteria? Yes No (route to DR staff)
 In a P area or listed (route to P staff)
 Not in DR/P area

Wang



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

TEL: 916.961.3960
FAX: 916.961.6552

January 8, 2004

0401857

Cruz Roofing
170 Vista Creek Circle
Sacramento, CA 95835
TEL: (916) 419-9658; M: 296-1080
FAX: (916) 419-6958

CITY COPY



Attn.: Mr. Ray Cruz,

re: Job 2004018: WANG

Subject: Structural Investigation Report of the Roof for the Residence located at 9 Wintermist Court, Sacramento, CA 95831.

As requested by Mr. Ray Cruz, this is a report to determine what needs should be addressed to correct any structural deficiencies of the roof. Paul Zacher visited the site January 8, 2004. The investigation was made to determine the existing condition of the structure. All information, data and analysis contained within this report are based on the 1997 Uniform Building Code with 2001 CBC Title 24 Amendments.

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

DESCRIPTION:

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

CITY OF SACRAMENTO
NORTH PERMIT
CENTER

FEB 06 2004

RECEIVED

CONSTRUCTION:

Roof:
The roof covering will consist of a Light Weight Concrete Tile over 7/16" solid sheathing. The roof structure is framed with pre-engineered wood trusses spaced at 24" on center.

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.

1/2m

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Wang



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

TEL: 916.961.3960
FAX: 916.961.6552

RECOMMENDATIONS:

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

Roof Structure:

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

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

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

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

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

Sincerely,

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

DESIGN LOADING:

Roof Pitch 6 in 12
Pitch Adjustment Factor 1.12

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

Live Load on top chord 14.3

LOCATION: TOP CHORD

| <u>MATERIAL</u> | <u>WEIGHT</u> | |
|--------------------|---------------|-----|
| Light Weight Tile | 6.50 | psf |
| Roofing felt | 0.30 | psf |
| 7/16" OSB/ plywood | 1.30 | psf |
| 1x4 skip sht'g | 1.09 | psf |
| 2x4 truss @ 24" oc | <u>0.64</u> | psf |
| Total Load | 9.8 | 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 #: 04_018

Date: 01/08/2004

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

LOADING:

B1

Dr = $14.1 \text{ psf} \times 11'-0" = 155 \text{ plf}$

Lr = $16.0 \text{ psf} \times 11'-0" = 176 \text{ plf}$

4 x 12 #2 + 1-3/4" x 11-1/4" LVL

155 / 176

16'-0"

B2

Dr = $14.1 \text{ psf} \times 17'-0" = 240 \text{ plf}$

Lr = $16.0 \text{ psf} \times 17'-0" = 272 \text{ plf}$

4 x 12 #2 + 1-3/4" x 11-1/4" LVL

240 / 272

12'-0"

Paul Zacher - Structural Engr's
 4701 Lakeside Way
 Fair Oaks, CA 95628
 TEL: (916) 961-3960
 FAX: (916) 961-6552

Title :
 Dsgnr:
 Description :
 Scope :

Job #
 Date: 5:18PM, 8 JAN 04

Rev: 560106
 User: KW-0602844, Ver 5.6.1, 25-Oct-2002
 (c)1983-2002 ENERCALC Engineering Software

Timber Beam & Joist

c:\documents and settings\paul zacher\desktop

Description RAFTERS AND BEAMS

Timber Member Information

Calculations are designed to 1997 NDS and 1997 UBC Requirements

| | | B1 | B2 |
|----------------------|-----|-------------------|-------------------|
| Timber Section | | 4x12#2 + 1 | 4x12#2 + 1 |
| Beam Width | in | 5.250 | 5.250 |
| Beam Depth | in | 11.250 | 11.250 |
| Le: Unbraced Length | ft | 0.00 | 0.00 |
| Timber Grade | | ustom. DF#2 + LVL | ustom. DF#2 + LVL |
| Fb - Basic Allow | psi | 1,450.0 | 1,450.0 |
| Fv - Basic Allow | psi | 158.0 | 158.0 |
| Elastic Modulus | ksi | 1,666.7 | 1,666.7 |
| Load Duration Factor | | 1.250 | 1.250 |
| Member Type | | Manuf/Pine | Manuf/Pine |
| Repetitive Status | | No | No |

Center Span Data

| Span | ft | 16.00 | 12.00 |
|-----------|------|--------|--------|
| Dead Load | #/ft | 155.00 | 240.00 |
| Live Load | #/ft | 176.00 | 272.00 |

Results Ratio = 0.6332 0.5510

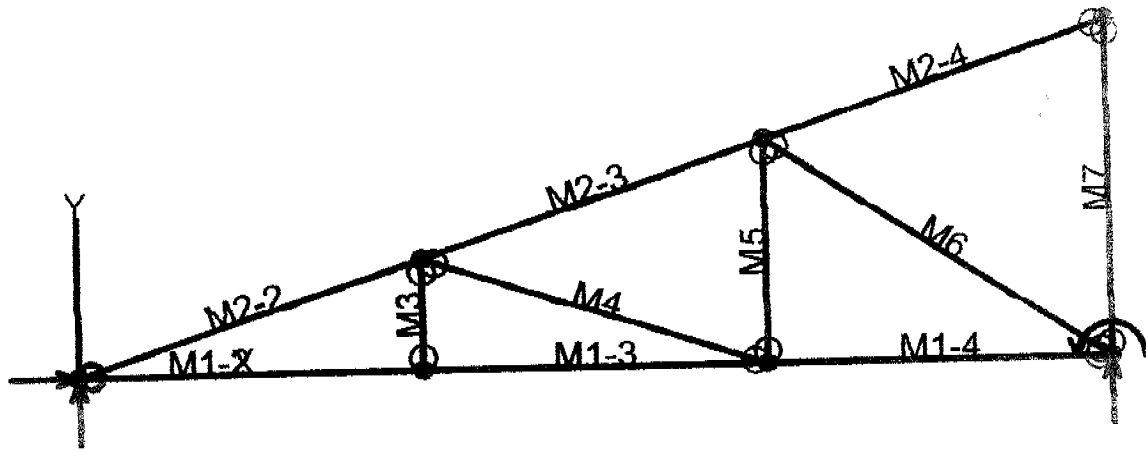
| | | | |
|---------------|------|------------|------------|
| Mmax @ Center | in-k | 127.10 | 110.59 |
| @ X = | ft | 8.00 | 6.00 |
| fb: Actual | psi | 1,147.7 | 998.6 |
| Fb: Allowable | psi | 1,812.5 | 1,812.5 |
| | | Bending OK | Bending OK |
| fv: Actual | psi | 59.7 | 66.2 |
| Fv: Allowable | psi | 197.5 | 197.5 |
| | | Shear OK | Shear OK |

Reactions

| | | | | |
|-------------|------------|-----|----------|----------|
| @ Left End | DL | lbs | 1,240.00 | 1,440.00 |
| | LL | lbs | 1,408.00 | 1,632.00 |
| | Max. DL+LL | lbs | 2,648.00 | 3,072.00 |
| @ Right End | DL | lbs | 1,240.00 | 1,440.00 |
| | LL | lbs | 1,408.00 | 1,632.00 |
| | Max. DL+LL | lbs | 2,648.00 | 3,072.00 |

Deflections

| | | Ratio OK | Deflection OK |
|-------------------|----|----------|---------------|
| Center DL Defl | in | -0.220 | -0.108 |
| L/Defl Ratio | | 872.2 | 1,335.2 |
| Center LL Defl | in | -0.250 | -0.122 |
| L/Defl Ratio | | 768.1 | 1,178.1 |
| Center Total Defl | in | -0.470 | -0.230 |
| Location | ft | 8.000 | 6.000 |
| L/Defl Ratio | | 408.4 | 625.9 |



Truss 1

VisualAnalysis 4.00 Report

Company: Paul Zacher - Structural Engineers Engineer: Paul Zacher

File: C:\Documents and Settings\Paul Zacher\Desktop\Chu04_002\Truss 1.vap

Nodes

| Node | X ft | Y ft | Fix | DX | Fix | DY | Fix | RZ |
|------|---------|---------|-----|----|-----|----|-----|-----|
| N1 | 0.00 | 0.00 | Yes | | Yes | | | No |
| N2 | 21.00 | 0.00 | No | | " | | | Yes |
| N3 | 21.00 | 7.00 | " | | No | | | No |
| N4 | 7.00 | 0.00 | " | | " | | | " |
| N5 | 14.00 | 0.00 | " | | " | | | " |
| N6 | 7.00 | 2.33 | " | | " | | | " |
| N7 | 14.00 | 4.67 | " | | " | | | " |

Member Elements

| Member | Section | Material | Length ft |
|--------|---------|----------|--------------|
| M1-2 | SS2x4 | Wood | 7.00 |
| M1-3 | " | " | 7.00 |
| M1-4 | " | " | 7.00 |
| M2-2 | " | " | 7.38 |
| M2-3 | " | " | 7.38 |
| M2-4 | " | " | 7.38 |
| M3 | " | " | 2.33 |
| M4 | " | " | 7.38 |
| M5 | " | " | 4.67 |
| M6 | " | " | 8.41 |
| M7 | " | " | 7.00 |

Section Properties

| Category | Section | Ax in ² | Ix in ⁴ | Sz(+y) in ³ | Sz(-y) in ³ |
|----------|---------|-----------------------|-----------------------|---------------------------|---------------------------|
| Wood Sha | SS2x4 | 5.25 | 5.36 | 3.06 | 3.06 |

Material Properties

| Material | Strength psi | Elasticity psi | Poisson | Density lb/ft ³ |
|----------|-----------------|-------------------|---------|-------------------------------|
| Wood | -NA- | 1700000.00 | 0.36 | 40.47 |

Load Combination Summary

Equation Case: UBC97 12.8a

Combination: 1D+1Lr

Contributing Cases & Source

Dead Load (Dead loads)

Roof Live Load (Roof Live loads)

Nodal Reactions

| Node | Load Case | FX lb | FY lb | MZ lb-ft |
|------|-------------|----------|----------|-------------|
| N1 | UBC97 12.8a | 0.00 | 615.30 | -NA- |
| N2 | " | -NA- | 615.30 | 0.00 |

Member Results

| Member | Fx lb | Vy lb | Mz lb-ft | Dx in | Dy in |
|--------|----------------|----------------|----------------|--------------|--------------|
| M1-2 | 1334.32 | -32.82 | -19.07 | 0.01 | -0.10 |
| " | 1334.32 | -12.76 | 34.09 | 0.01 | -0.10 |
| " | 1334.32 | 7.31 | 40.45 | 0.00 | -0.07 |
| " | 1334.32 | 27.38 | 0.00 | 0.00 | 0.00 |
| M1-3 | 1334.32 | -33.55 | -43.22 | 0.03 | -0.07 |
| " | 1334.32 | -13.48 | 11.63 | 0.02 | -0.09 |
| " | 1334.32 | 6.58 | 19.68 | 0.02 | -0.10 |
| " | 1334.32 | 26.65 | -19.07 | 0.01 | -0.10 |
| M1-4 | 677.52 | -23.93 | 0.00 | 0.03 | 0.00 |
| " | 677.52 | -3.86 | 32.40 | 0.03 | -0.05 |
| " | 677.52 | 16.21 | 17.99 | 0.03 | -0.06 |
| " | 677.52 | 36.27 | -43.22 | 0.03 | -0.07 |
| M2-2 | -1451.7 | 135.80 | 0.00 | 0.00 | 0.00 |
| " | -1414.8 | 25.12 | 197.80 | -0.00 | -0.21 |
| " | -1377.9 | -85.56 | 123.48 | -0.01 | -0.21 |
| " | -1341.0 | -196.23 | -222.95 | -0.01 | -0.10 |
| M2-3 | -768.42 | 162.74 | -222.95 | -0.01 | -0.10 |
| " | -731.52 | 52.06 | 41.10 | -0.02 | -0.11 |
| " | -694.63 | -58.62 | 33.04 | -0.02 | -0.09 |
| " | -657.74 | -169.30 | -247.13 | -0.02 | -0.06 |
| M2-4 | -66.50 | 199.51 | -247.13 | -0.02 | -0.06 |
| " | -29.61 | 88.83 | 107.36 | -0.02 | -0.17 |
| " | 7.28 | -21.85 | 189.74 | -0.02 | -0.18 |
| " | 44.18 | -132.53 | 0.00 | -0.02 | 0.01 |
| M3 | 59.47 | 0.00 | 0.00 | 0.10 | 0.01 |
| " | 59.47 | 0.00 | 0.00 | 0.10 | 0.02 |
| " | 59.47 | 0.00 | 0.00 | 0.10 | 0.02 |
| " | 59.47 | 0.00 | 0.00 | 0.10 | 0.02 |
| M4 | -692.33 | 0.00 | 0.00 | 0.04 | -0.06 |
| " | -692.33 | 0.00 | 0.00 | 0.05 | -0.09 |
| " | -692.33 | 0.00 | 0.00 | 0.05 | -0.08 |
| " | -692.33 | 0.00 | 0.00 | 0.05 | -0.07 |
| M5 | 288.76 | 0.00 | 0.00 | -0.07 | -0.03 |
| " | 288.76 | 0.00 | 0.00 | -0.07 | -0.02 |
| " | 288.76 | 0.00 | 0.00 | -0.07 | -0.01 |
| " | 288.76 | 0.00 | 0.00 | -0.06 | 0.00 |
| M6 | -814.28 | 0.00 | 0.00 | 0.03 | -0.03 |
| " | -814.28 | 0.00 | 0.00 | 0.03 | -0.01 |
| " | -814.28 | 0.00 | 0.00 | 0.03 | 0.02 |
| " | -814.28 | 0.00 | 0.00 | 0.04 | -0.05 |
| M7 | -139.70 | 0.00 | 0.00 | 0.00 | -0.03 |
| " | -139.70 | 0.00 | 0.00 | -0.00 | -0.01 |
| " | -139.70 | 0.00 | 0.00 | -0.00 | 0.00 |
| " | -139.70 | 0.00 | 0.00 | -0.00 | 0.02 |

BENDING & COMP: TRUSS 1 - MEMBER 2-2

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

Grading:

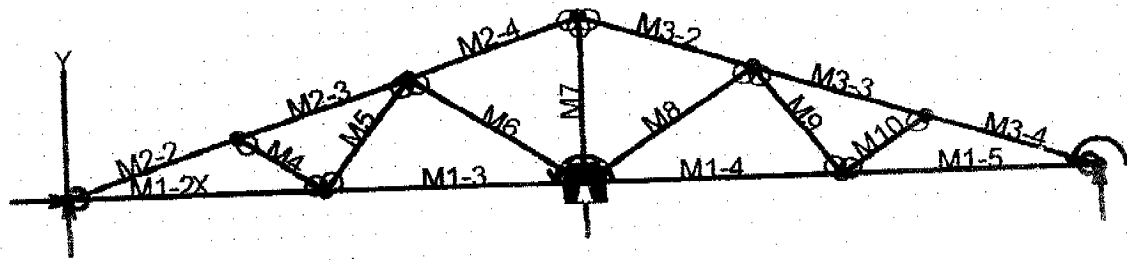
2x or 4x

Doug-fir larch: No. 2

Assumptions:

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

| | |
|-------------------------|--------------------------------|
| Width, b | 1.5 inches |
| Depth, d | 3.5 inches |
| Length | 7.38 feet |
| Max Axial Comp, C | 1341 lbs |
| Max Reaction, R | 196 lbs |
| Max Moment, M | 222 ft-lbs |
| Max LL Deflection | 0.05 inches |
| Max TL Deflection | 0.10 inches |
| LL Defl Criteria = L/ | 240 |
| TL Defl Criteria = L/ | 180 |
| Duration factor, Cd | 1.25 |
| Repetitive Factor, Cr | 1.15 |
| Size Factor, Cf bending | 1.5 1.5 for 2x4, 1.3 for 2x6 |
| Size Factor, Cf comp | 1.15 1.15 for 2x4, 1.1 for 2x6 |
| Buckling Factor, CT = | 1.20 |
| fc = | 255 psi |
| Fce = | 958 psi |
| Fc* = | 2084 psi |
| F'e = | 844 psi |
| fb = | 870 psi |
| F'b = Fb* = | 2156 psi |
| Shear D/C ratio | 0.47 < 1.0, Member OK |
| Interaction equation: | |
| (fc/F'e)^2 + | |
| fb / (F'b(1-fc/Fce)) = | 0.64 < 1.0, Member OK |
| Live Load defl ratio | 0.14 < 1.0, Member OK |
| Total Load defl ratio | 0.20 < 1.0, Member OK |



Truss 2

VisualAnalysis 4.00 Report

Company: Paul Zacher - Structural Engineers Engineer: Paul Zacher

File: C:\Documents and Settings\Paul Zacher\Desktop\Chu04_002\Truss 2.vap

Nodes

| Node | X ft | Y ft | Fix | DX | Fix | DY | Fix | RZ |
|------|---------|---------|-----|----|-----|----|-----|----|
| N1 | 0.00 | 0.00 | Yes | | Yes | | No | |
| N2 | 44.00 | 0.00 | No | | " | | Yes | |
| N3 | 22.00 | 7.33 | " | | No | | No | |
| N4 | 11.00 | 0.00 | " | | " | | " | |
| N5 | 22.00 | 0.00 | " | | Yes | | Yes | |
| N6 | 33.00 | 0.00 | " | | No | | No | |
| N7 | 7.33 | 2.44 | " | | " | | " | |
| N8 | 14.67 | 4.89 | " | | " | | " | |
| N9 | 29.33 | 4.89 | " | | " | | " | |
| N10 | 36.67 | 2.44 | " | | " | | " | |

Member Elements

| Member | Section | Material | Length ft |
|--------|---------|----------|--------------|
| M1-2 | SS2x4 | Wood | 11.00 |
| M1-3 | " | " | 11.00 |
| M1-4 | " | " | 11.00 |
| M1-5 | " | " | 11.00 |
| M2-2 | " | " | 7.73 |
| M2-3 | " | " | 7.73 |
| M2-4 | " | " | 7.73 |
| M3-2 | " | " | 7.73 |
| M3-3 | " | " | 7.73 |
| M3-4 | " | " | 7.73 |
| M4 | " | " | 4.41 |
| M5 | " | " | 6.11 |
| M6 | " | " | 8.81 |
| M7 | " | " | 7.33 |
| M8 | " | " | 8.81 |
| M9 | " | " | 6.11 |
| M10 | " | " | 4.41 |

Section Properties

| Category | Section | Ax in ² | Iz in ⁴ | Sz (+y) in ³ | Sz (-y) in ³ |
|----------|---------|-----------------------|-----------------------|----------------------------|----------------------------|
| Wood Sha | SS2x4 | 5.25 | 5.36 | 3.06 | 3.06 |

Material Properties

| Material | Strength psi | Elasticity psi | Poisson | Density lb/ft ³ |
|----------|-----------------|-------------------|---------|-------------------------------|
| Wood | -NA- | 1700000.00 | 0.36 | 40.47 |

Load Combination Summary

Equation Case: UBC97 12.8a

Combination: 1D+1Lr

Contributing Cases & Source

Dead Load (Dead loads)

Roof Live Load (Roof Live loads)

Nodal Reactions

| Node | Load Case | FX lb | FY lb | MZ lb-ft |
|------|-------------|----------|----------|-------------|
| N1 | UBC97 12.8a | 0.00 | 358.29 | -NA- |
| N2 | " | -NA- | 358.29 | 0.00 |
| N5 | " | -NA- | 1861.81 | 0.00 |

Member Results

| Member | Fx lb | Vy lb | Mz lb-ft | Dx in | Dy in |
|--------|----------|----------|-------------|----------|----------|
| M1-2 | 518.56 | -56.86 | -105.12 | 0.01 | -0.03 |
| " | 518.56 | -25.32 | 45.50 | 0.01 | -0.14 |
| " | 518.56 | 6.21 | 80.54 | 0.00 | -0.16 |
| " | 518.56 | 37.74 | 0.00 | 0.00 | 0.00 |
| M1-3 | -162.62 | -45.20 | -81.98 | 0.01 | 0.00 |
| " | -162.62 | -13.66 | 25.89 | 0.01 | -0.05 |
| " | -162.62 | 17.87 | 18.17 | 0.01 | -0.05 |
| " | -162.62 | 49.40 | -105.12 | 0.01 | -0.03 |
| M1-4 | -162.62 | -49.40 | -105.12 | 0.00 | -0.03 |
| " | -162.62 | -17.87 | 18.17 | 0.00 | -0.05 |
| " | -162.62 | 13.66 | 25.89 | 0.00 | -0.05 |
| " | -162.62 | 45.20 | -81.98 | 0.01 | 0.00 |
| M1-5 | 518.56 | -37.74 | 0.00 | 0.01 | 0.00 |
| " | 518.56 | -6.21 | 80.54 | 0.01 | -0.16 |
| " | 518.56 | 25.32 | 45.50 | 0.01 | -0.14 |
| " | 518.56 | 56.86 | -105.12 | 0.00 | -0.03 |
| M2-2 | -593.30 | 140.20 | 0.00 | 0.00 | 0.00 |
| " | -554.66 | 24.24 | 211.73 | -0.00 | -0.21 |
| " | -516.03 | -91.71 | 124.81 | -0.00 | -0.19 |
| " | -477.39 | -207.67 | -260.76 | -0.01 | -0.04 |
| M2-3 | -181.45 | 172.56 | -260.76 | -0.01 | -0.04 |
| " | -142.81 | 56.61 | 34.36 | -0.01 | -0.04 |
| " | -104.18 | -59.35 | 30.83 | -0.01 | -0.04 |
| " | -65.54 | -175.30 | -271.35 | -0.01 | -0.02 |
| M2-4 | 824.32 | 209.04 | -271.35 | -0.01 | -0.02 |
| " | 862.95 | 93.08 | 117.75 | -0.00 | -0.17 |
| " | 901.58 | -22.87 | 208.20 | -0.00 | -0.21 |
| " | 940.22 | -138.83 | 0.00 | 0.00 | -0.01 |
| M3-2 | 824.32 | -209.04 | -271.35 | 0.02 | -0.02 |
| " | 862.95 | -93.08 | 117.75 | 0.01 | -0.17 |
| " | 901.58 | 22.87 | 208.20 | 0.01 | -0.20 |
| " | 940.22 | 138.83 | 0.00 | 0.01 | -0.01 |
| M3-3 | -181.45 | -172.56 | -260.76 | 0.02 | -0.04 |
| " | -142.81 | -56.61 | 34.36 | 0.02 | -0.04 |
| " | -104.18 | 59.35 | 30.83 | 0.02 | -0.03 |
| " | -65.54 | 175.30 | -271.35 | 0.02 | -0.02 |
| M3-4 | -593.30 | -140.20 | 0.00 | 0.01 | 0.00 |
| " | -554.66 | -24.24 | 211.73 | 0.01 | -0.21 |
| " | -516.03 | 91.71 | 124.81 | 0.01 | -0.19 |
| " | -477.39 | 207.67 | -260.76 | 0.02 | -0.04 |
| M4 | -481.83 | 0.00 | 0.00 | 0.03 | -0.03 |

12

| Member | Fx lb | Vy lb | Mz lb-ft | Dx in | Dy in |
|--------|----------|----------|-------------|----------|----------|
| " | -481.83 | 0.00 | 0.00 | 0.03 | -0.03 |
| " | -481.83 | 0.00 | 0.00 | 0.03 | -0.03 |
| " | -481.83 | 0.00 | 0.00 | 0.03 | -0.02 |
| M5 | 466.89 | 0.00 | 0.00 | -0.02 | -0.03 |
| " | 466.89 | 0.00 | 0.00 | -0.02 | -0.02 |
| " | 466.89 | 0.00 | 0.00 | -0.02 | -0.02 |
| " | 466.89 | 0.00 | 0.00 | -0.02 | -0.02 |
| M6 | -823.76 | 0.00 | 0.00 | 0.00 | 0.00 |
| " | -823.76 | 0.00 | 0.00 | 0.01 | -0.02 |
| " | -823.76 | 0.00 | 0.00 | 0.01 | -0.01 |
| " | -823.76 | 0.00 | 0.00 | 0.01 | -0.00 |
| M7 | -857.82 | 0.00 | 0.00 | -0.01 | -0.01 |
| " | -857.82 | 0.00 | 0.00 | -0.01 | -0.01 |
| " | -857.82 | 0.00 | 0.00 | -0.00 | -0.01 |
| " | -857.82 | 0.00 | 0.00 | 0.00 | -0.01 |
| M8 | -823.76 | 0.00 | 0.00 | -0.01 | -0.03 |
| " | -823.76 | 0.00 | 0.00 | -0.00 | -0.02 |
| " | -823.76 | 0.00 | 0.00 | 0.00 | -0.01 |
| " | -823.76 | 0.00 | 0.00 | 0.00 | -0.00 |
| M9 | 466.89 | 0.00 | 0.00 | 0.03 | -0.02 |
| " | 466.89 | 0.00 | 0.00 | 0.03 | -0.01 |
| " | 466.89 | 0.00 | 0.00 | 0.03 | -0.01 |
| " | 466.89 | 0.00 | 0.00 | 0.03 | -0.01 |
| M10 | -481.83 | 0.00 | 0.00 | -0.02 | -0.03 |
| " | -481.83 | 0.00 | 0.00 | -0.02 | -0.03 |
| " | -481.83 | 0.00 | 0.00 | -0.02 | -0.03 |
| " | -481.83 | 0.00 | 0.00 | -0.02 | -0.03 |

BENDING & COMP: TRUSS 2 - MEMBER 2-2

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

Grading:

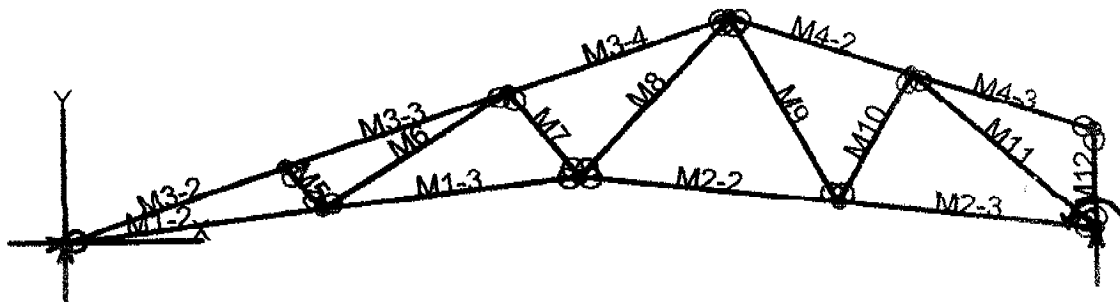
2x or 4x

Doug-fir larch: No. 2

Assumptions:

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

| | |
|-------------------------|--------------------------------|
| Width, b | 1.5 inches |
| Depth, d | 3.5 inches |
| Length | 7.73 feet |
| Max Axial Comp, C | 477 lbs |
| Max Reaction, R | 207 lbs |
| Max Moment, M | 260 ft-lbs |
| Max LL Deflection | 0.02 inches |
| Max TL Deflection | 0.04 inches |
| LL Defl Criteria = L/ | 240 |
| TL Defl Criteria = L/ | 180 |
| Duration factor, Cd | 1.25 |
| Repetitive Factor, Cr | 1.15 |
| Size Factor, Cf bending | 1.5 1.5 for 2x4, 1.3 for 2x6 |
| Size Factor, Cf comp | 1.15 1.15 for 2x4, 1.1 for 2x6 |
| Buckling Factor, CT = | 1.21 |
| fc = | 91 psi |
| Fce = | 881 psi |
| Fc* = | 2084 psi |
| F'c = | 786 psi |
| fb = | 1019 psi |
| F'b = Fb* = | 2156 psi |
| Shear D/C ratio | 0.50 < 1.0, Member OK |
| Interaction equation: | |
| (fc/F'c) ² + | |
| fb / (F'b(1-fc/Fce)) = | 0.54 < 1.0, Member OK |
| Live Load defl ratio | 0.05 < 1.0, Member OK |
| Total Load defl ratio | 0.08 < 1.0, Member OK |



Truss 3

VisualAnalysis 4.00 Report

Company: Paul Zacher - Structural Engineers Engineer: Paul Zacher

File: C:\Documents and Settings\Paul Zacher\Desktop\Chu04_002\Truss 3.vap

Nodes

| Node | X ft | Y ft | Fix | DX | Fix | DY | Fix | RZ |
|------|---------|---------|-----|----|-----|----|-----|-----|
| N1 | 0.00 | 0.00 | Yes | | Yes | | | No |
| N2 | 22.00 | 7.33 | No | | No | | | " |
| N3 | 34.00 | 3.33 | " | | " | | | " |
| N4 | 17.00 | 2.00 | " | | " | | | " |
| N5 | 34.00 | 0.00 | " | | Yes | | | Yes |
| N6 | 8.50 | 1.00 | " | | No | | | No |
| N7 | 25.50 | 1.00 | " | | " | | | " |
| N8 | 28.00 | 5.33 | " | | " | | | " |
| N9 | 7.33 | 2.44 | " | | " | | | " |
| N10 | 14.67 | 4.89 | " | | " | | | " |

Member Elements

| Member | Section | Material | Length ft |
|--------|---------|----------|--------------|
| M1-2 | SS2x4 | Wood | 8.56 |
| M1-3 | " | " | 8.56 |
| M2-2 | " | " | 8.56 |
| M2-3 | " | " | 8.56 |
| M3-2 | SS2x6 | " | 7.73 |
| M3-3 | " | " | 7.73 |
| M3-4 | " | " | 7.73 |
| M4-2 | SS2x4 | " | 6.32 |
| M4-3 | " | " | 6.32 |
| M5 | SS2x6 | " | 1.86 |
| M6 | " | " | 7.29 |
| M7 | " | " | 3.71 |
| M8 | " | " | 7.31 |
| M9 | " | " | 7.23 |
| M10 | " | " | 5.00 |
| M11 | " | " | 8.03 |
| M12 | " | " | 3.33 |

Section Properties

| Category | Section | Ax in ² | Iz in ⁴ | Sz (+y) in ³ | Sz (-y) in ³ |
|----------|---------|-----------------------|-----------------------|----------------------------|----------------------------|
| Wood Sha | SS2x4 | 5.25 | 5.36 | 3.06 | 3.06 |
| " | SS2x6 | 8.25 | 20.80 | 7.56 | 7.56 |

Material Properties

| Material | Strength psi | Elasticity psi | Poisson | Density lb/ft ³ |
|----------|-----------------|-------------------|---------|-------------------------------|
| Wood | -NA- | 1700000.00 | 0.36 | 40.47 |

10

| Material | Strength | Elasticity | Poisson | Density |
|----------|----------|------------|---------|--------------------|
| | psi | psi | psi | lb/ft ³ |

Load Combination Summary

Equation Case: UBC97 12.8a

Combination: 1D+1Lr

Contributing Cases & Source

Dead Load (Dead loads)

Roof Live Load (Roof Live loads)

Nodal Reactions

| Node | Load Case | FX lb | FY lb | MZ lb-ft |
|------|-------------|----------|----------|-------------|
| N1 | UBC97 12.8a | 0.00 | 996.20 | -NA- |
| N5 | " | -NA- | 996.20 | 0.00 |

Member Results

| Member | Fx lb | Vy lb | Mz lb-ft | Dx in | Dy in |
|--------|----------------|----------------|----------------|----------|--------------|
| M1-2 | 3661.16 | 33.44 | 0.00 | 0.00 | 0.00 |
| " | 3664.00 | 9.24 | 60.85 | 0.01 | -0.23 |
| " | 3666.85 | -14.96 | 52.68 | 0.03 | -0.37 |
| " | 3669.70 | -39.16 | -24.49 | 0.04 | -0.45 |
| M1-3 | 2707.54 | 39.16 | -24.49 | 0.04 | -0.45 |
| " | 2710.38 | 14.96 | 52.68 | 0.05 | -0.51 |
| " | 2713.23 | -9.24 | 60.85 | 0.06 | -0.50 |
| " | 2716.08 | -33.44 | 0.00 | 0.07 | -0.40 |
| M2-2 | 1305.15 | -44.68 | -71.76 | 0.18 | -0.20 |
| " | 1307.99 | -20.48 | 21.17 | 0.17 | -0.30 |
| " | 1310.84 | 3.71 | 45.09 | 0.17 | -0.37 |
| " | 1313.69 | 27.91 | 0.00 | 0.16 | -0.37 |
| M2-3 | 1112.59 | -27.91 | 0.00 | 0.19 | 0.02 |
| " | 1115.44 | -3.71 | 45.09 | 0.19 | -0.10 |
| " | 1118.29 | 20.48 | 21.17 | 0.18 | -0.16 |
| " | 1121.13 | 44.68 | -71.76 | 0.18 | -0.20 |
| M3-2 | -3892.9 | 168.86 | 0.00 | 0.00 | 0.00 |
| " | -3854.3 | 52.91 | 285.58 | -0.01 | -0.23 |
| " | -3815.7 | -63.05 | 272.51 | -0.02 | -0.37 |
| " | -3777.0 | -179.00 | -39.20 | -0.03 | -0.44 |
| M3-3 | -3655.7 | 145.13 | -39.20 | -0.03 | -0.44 |
| " | -3617.1 | 29.18 | 185.24 | -0.03 | -0.48 |
| " | -3578.4 | -86.78 | 111.04 | -0.04 | -0.47 |
| " | -3539.8 | -202.73 | -261.81 | -0.05 | -0.43 |
| M3-4 | -2472.5 | 207.80 | -261.81 | -0.05 | -0.43 |
| " | -2433.9 | 91.85 | 124.10 | -0.05 | -0.42 |
| " | -2395.3 | -24.11 | 211.37 | -0.06 | -0.38 |
| " | -2356.6 | -140.06 | 0.00 | -0.07 | -0.29 |
| M4-2 | -1351.0 | -176.46 | -216.04 | 0.11 | -0.14 |
| " | -1319.4 | -81.59 | 55.89 | 0.11 | -0.24 |
| " | -1287.8 | 13.28 | 127.91 | 0.12 | -0.30 |
| " | -1256.1 | 108.14 | 0.00 | 0.12 | -0.27 |
| M4-3 | -36.05 | -108.14 | 0.00 | 0.11 | 0.04 |
| " | -4.43 | -13.28 | 127.91 | 0.11 | -0.10 |
| " | 27.20 | 81.59 | 55.89 | 0.11 | -0.13 |
| " | 58.82 | 176.46 | -216.04 | 0.11 | -0.14 |
| M5 | -346.10 | 0.00 | 0.00 | 0.40 | -0.20 |
| " | -346.10 | 0.00 | 0.00 | 0.40 | -0.19 |

| Member | Fx lb | Vy lb | Mz lb-ft | Dx in | Dy in |
|--------|----------|----------|-------------|----------|----------|
| " | -346.10 | 0.00 | 0.00 | 0.40 | -0.19 |
| " | -346.10 | 0.00 | 0.00 | 0.40 | -0.18 |
| M6 | 861.54 | 0.00 | 0.00 | -0.15 | -0.42 |
| " | 861.54 | 0.00 | 0.00 | -0.15 | -0.42 |
| " | 861.54 | 0.00 | 0.00 | -0.15 | -0.41 |
| " | 861.54 | 0.00 | 0.00 | -0.15 | -0.40 |
| M7 | -657.71 | 0.00 | 0.00 | 0.38 | -0.20 |
| " | -657.71 | 0.00 | 0.00 | 0.38 | -0.18 |
| " | -657.71 | 0.00 | 0.00 | 0.38 | -0.17 |
| " | -657.71 | 0.00 | 0.00 | 0.38 | -0.15 |
| M8 | 1430.47 | 0.00 | 0.00 | -0.20 | -0.35 |
| " | 1430.47 | 0.00 | 0.00 | -0.20 | -0.31 |
| " | 1430.47 | 0.00 | 0.00 | -0.20 | -0.27 |
| " | 1430.47 | 0.00 | 0.00 | -0.19 | -0.22 |
| M9 | -156.06 | 0.00 | 0.00 | 0.27 | -0.12 |
| " | -156.06 | 0.00 | 0.00 | 0.27 | -0.07 |
| " | -156.06 | 0.00 | 0.00 | 0.27 | -0.02 |
| " | -156.06 | 0.00 | 0.00 | 0.27 | 0.03 |
| M10 | 235.36 | 0.00 | 0.00 | -0.12 | -0.25 |
| " | 235.36 | 0.00 | 0.00 | -0.12 | -0.21 |
| " | 235.36 | 0.00 | 0.00 | -0.11 | -0.17 |
| " | 235.36 | 0.00 | 0.00 | -0.11 | -0.13 |
| M11 | -1482.3 | 0.00 | 0.00 | 0.14 | 0.13 |
| " | -1482.3 | 0.00 | 0.00 | 0.15 | -0.01 |
| " | -1482.3 | 0.00 | 0.00 | 0.15 | 0.06 |
| " | -1482.3 | 0.00 | 0.00 | 0.16 | -0.08 |
| M12 | -113.99 | 0.00 | 0.00 | 0.00 | -0.19 |
| " | -113.99 | 0.00 | 0.00 | -0.00 | -0.17 |
| " | -113.99 | 0.00 | 0.00 | -0.00 | -0.14 |
| " | -113.99 | 0.00 | 0.00 | -0.00 | -0.12 |

BENDING & COMP: TRUSS 3 - MEMBER 3-3

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

Grading:

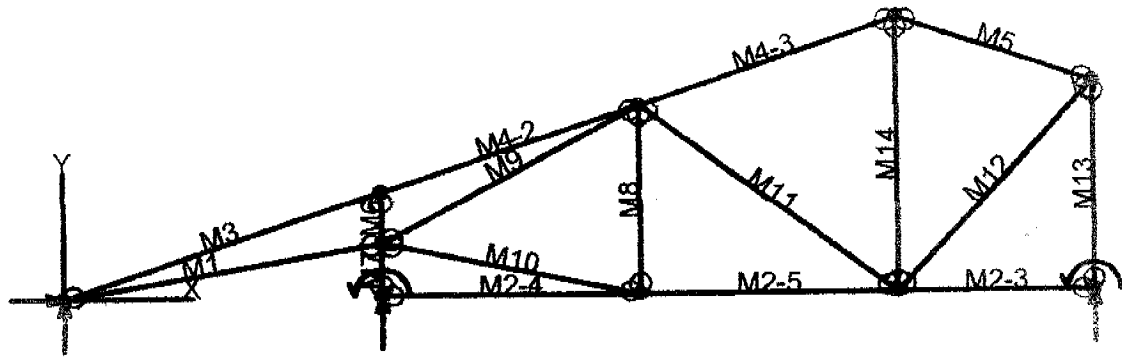
2x or 4x

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 | 5.5 inches |
| Length | 7.73 feet |
| Max Axial Comp, C | 3539 lbs |
| Max Reaction, R | 202 lbs |
| Max Moment, M | 261 ft-lbs |
| Max LL Deflection | 0.21 inches |
| Max TL Deflection | 0.43 inches |
| LL Defl Criteria = L/ | 240 |
| TL Defl Criteria = L/ | 180 |
| Duration factor, Cd | 1.25 |
| Repetitive Factor, Cr | 1.15 |
| Size Factor, Cf bending | 1.3 1.5 for 2x4, 1.3 for 2x6 |
| Size Factor, Cf comp | 1.1 1.15 for 2x4, 1.1 for 2x6 |
| Buckling Factor, CT = | 1.21 |
| fc = | 429 psi |
| Fce = | 2174 psi |
| Fc* = | 1994 psi |
| F'c = | 1436 psi |
| fb = | 414 psi |
| F'b = Fb* = | 1869 psi |
| Shear D/C ratio | 0.31 < 1.0, Member OK |
| Interaction equation: | |
| (fc/F'c) ² + | |
| fb / (F'b(1-fc/Fce)) = | 0.37 < 1.0, Member OK |
| Live Load defl ratio | 0.54 < 1.0, Member OK |
| Total Load defl ratio | 0.83 < 1.0, Member OK |



BENDING & COMP: TRUSS 4 - MEMBER 3

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

Grading:

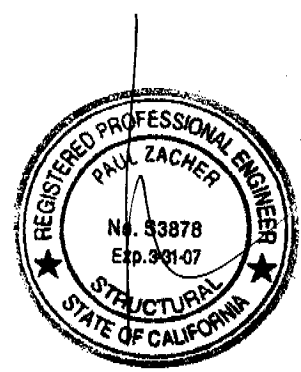
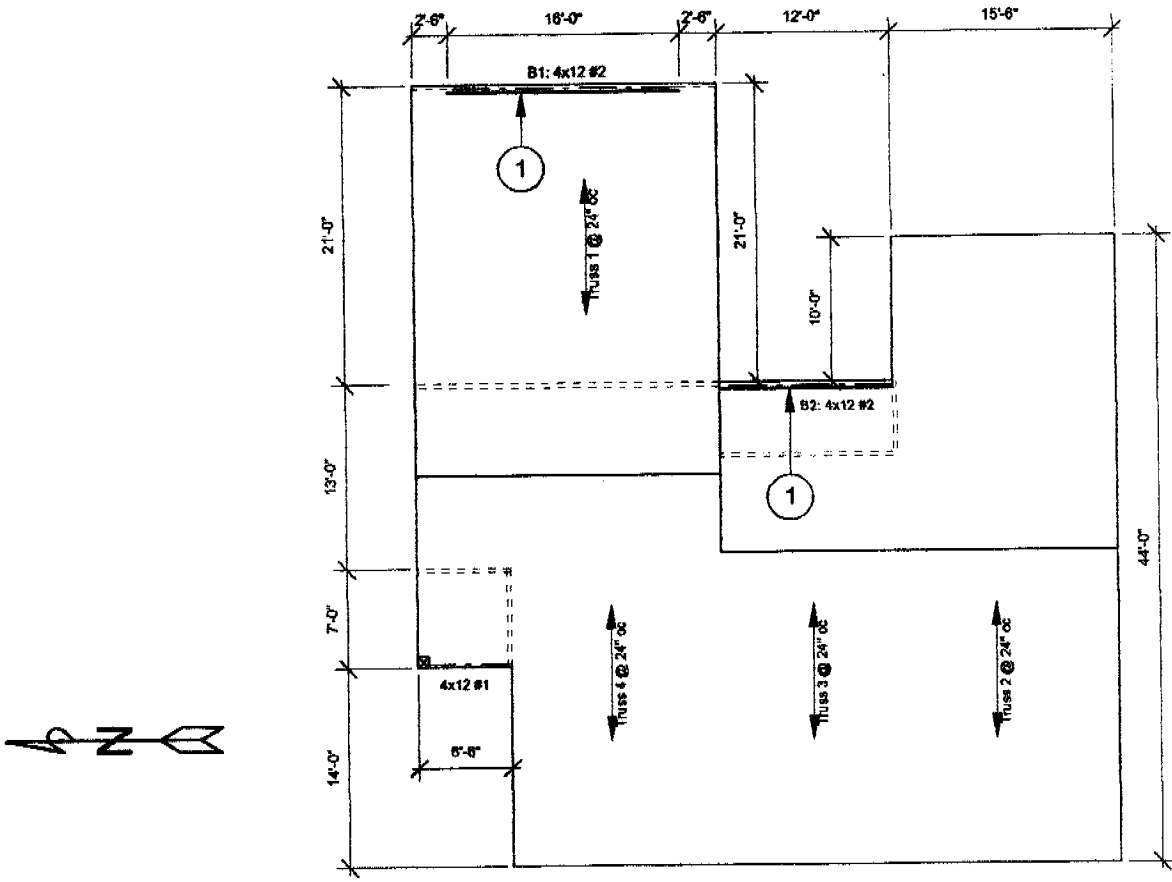
2x or 4x

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 | 5.5 inches |
| Length | 11.07 feet |
| Max Axial Comp, C | 113 lbs |
| Max Reaction, R | 35 lbs |
| Max Moment, M | 437 ft-lbs |
| Max LL Deflection | 0.11 inches |
| Max TL Deflection | 0.22 inches |
| LL Defl Criteria = L/ | 240 |
| TL Defl Criteria = L/ | 180 |
| Duration factor, Cd | 1.25 |
| Repetitive Factor, Cr | 1.15 |
| Size Factor, Cf bending | 1.3 1.5 for 2x4, 1.3 for 2x6 |
| Size Factor, Cf comp | 1.1 1.15 for 2x4, 1.1 for 2x6 |
| Buckling Factor, CT = | 1.30 |
| fc = | 14 psi |
| Fce= | 1141 psi |
| Fc*= | 1994 psi |
| F'c= | 961 psi |
| fb= | 693 psi |
| F'b=Fb*= | 1869 psi |
| Shear D/C ratio | 0.05 < 1.0, Member OK |
| Interaction equation: | |
| (fc/F'c) ² + | |
| fb/ (F'b(1-fc/Fce)) = | 0.38 < 1.0, Member OK |
| Live Load defl ratio | 0.20 < 1.0, Member OK |
| Total Load defl ratio | 0.30 < 1.0, Member OK |



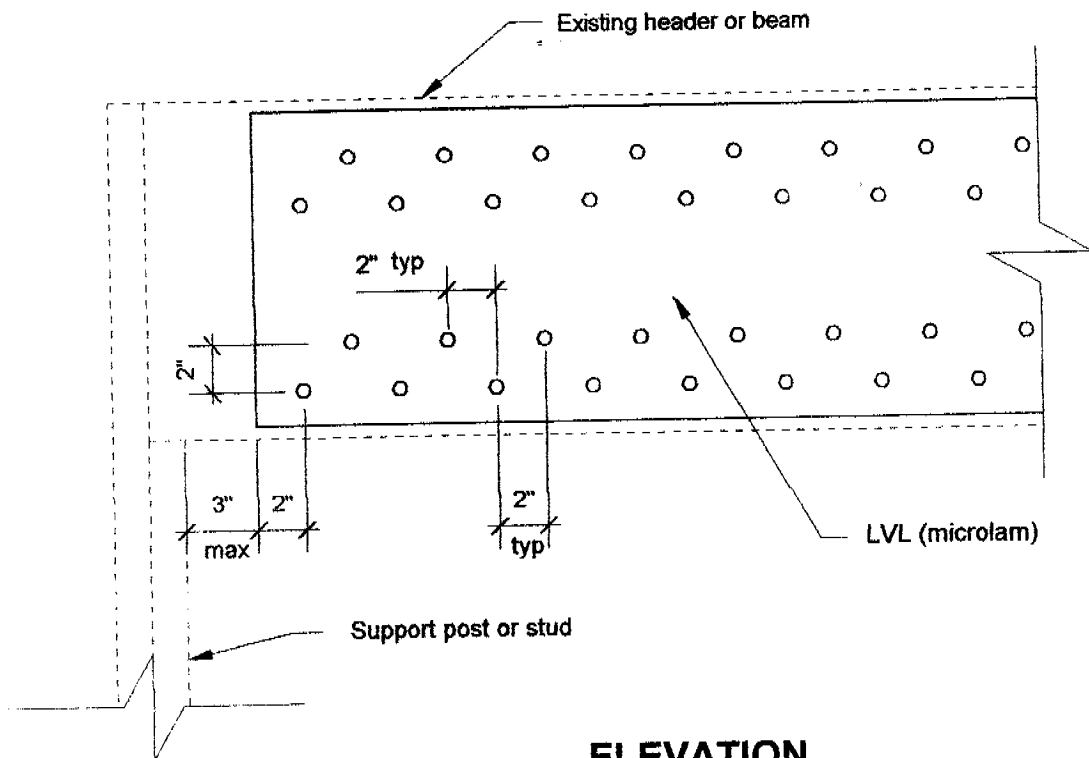
FRAMING NOTES:

1. Scab a 1 3/4" x 11 1/4" LVL to the existing 4x12 beam. See detail 2.

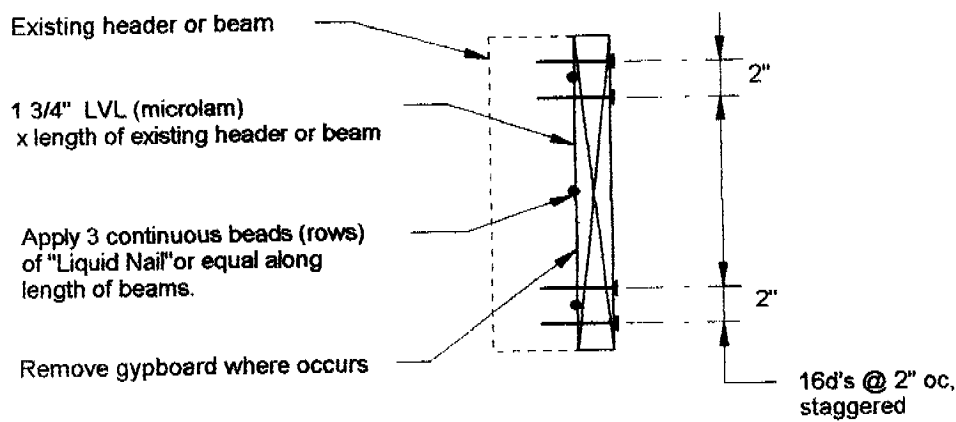
Notes:

- A. This is a reroof project. The new roofing material shall be a Light Weight Concrete Tile. The tile shall weigh less than or equal to 7.3 psf.
- B. All structural wood members that were observed appear to be in sound condition and without structural defect.

1 ROOF PLAN - WANG
Not to Scale 22



ELEVATION



SECTION

2

HEADER DETAIL

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

23

