

**CITY OF SACRAMENTO**

**Permit No: 9805629**

**1231 I Street, Sacramento, CA 95814**

**Insp Area: 2**

**Site Address: 1 DOWNRIVER CT SAC**

**Sub-Type: RES**

**Parcel No: 0310390072**

**Housing (Y/N): N**

**CONTRACTOR**

ZIMMERMAN ROOFING  
3560 RAMONA AV  
SACRAMENTO, CA

95826

**OWNER**

RICE DONALD A/ALINE Y  
1 DOWNRIVER CT  
SACRAMENTO CA

95831

**ARCHITECT**

**Nature of Work: T/O REROOF WITH TILE**

**CONSTRUCTION LENDING AGENCY :** I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C).

Lender's Name \_\_\_\_\_ Lender's Address \_\_\_\_\_

**LICENSED CONTRACTORS DECLARATION:** I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.

License Class C39 License Number 557559 Date 6-22-98 Contractor Signature [Signature]

**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 6-22-98 Applicant/Agent Signature [Signature]

**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 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 6-22-98 Applicant Signature [Signature]

**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.**

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

June 17, 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 98107: McCULLOUGH

Subject: Structural Investigation Report of the Roof for the Residence located at 1 Down River Court, 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 June 16, 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 1980's vintage.  
Occupancy: Residential.  
No. of Stories: Two.  
Dimensions: Approximately 2200 square feet with a first story plate height of 8 feet.

CONSTRUCTION:



Roof:

The roof covering will consist of Pioneer Light Weight Shake Tile over 1/2" solid sheathing. The living area is framed with pre-engineered trusses spaced at 24" on center except over the vaulted ceiling area. The vaulted ceiling is constructed with 2x6 rafters spaced at 16" on center supported at mid span with a 6x16 beam. The garage area is framed with 2x6 rafters spaced at 24" on center and 2x6 cross ties spaced at 4'-0" on center.

CONCLUSIONS:

Roof

The living area has sufficient structural capacity for the applied live and dead loads. The garage lacks 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.

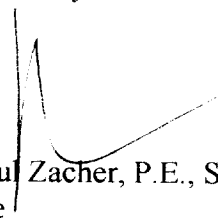
Garage:

1. Scab a 2x6 rafter to the existing 2x6 rafters where the span is greater than 12'-0" 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	6	in 12
Pitch Adjustment Factor	1.12	

**LOCATION: TOP CHORD**

<u>MATERIAL</u>	<u>WEIGHT</u>	
Pioneer Everwest Light Wt	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>1.28</u>	psf
Load	11.2	psf
Roof Pitch Adjustment	<u>1.32</u>	psf
Total Load	12.5	psf

**LOCATION: BOTTOM CHORD**

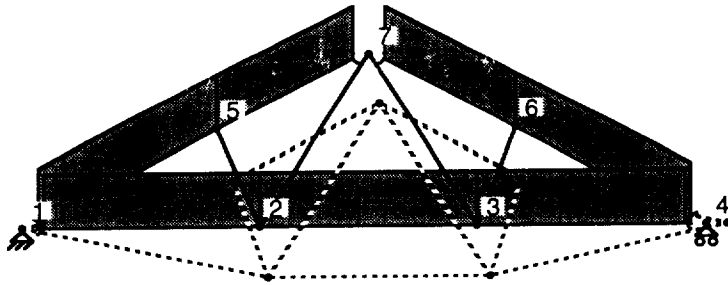
<u>MATERIAL</u>	<u>WEIGHT</u>	
Batt/blown insul	0.50	psf
2x4 truss @ 24" oc	0.64	psf
1/2" Gypboard	<u>2.50</u>	psf
Load	3.6	psf

**LOCATION: ROOF**

<u>MATERIAL</u>	<u>WEIGHT</u>	
Pioneer Everwest Light Wt	7.00	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	10.9	psf
Roof Pitch Adjustment	<u>1.29</u>	psf
Total Load	12.2	psf

**LOCATION: VAULT**

<u>MATERIAL</u>	<u>WEIGHT</u>	
Pioneer Everwest Light Wt	7.00	psf
Roofing felt	0.30	psf
1/2" OSB/ plywood	1.50	psf
1x4 skip sht'g	1.09	psf
2x6 rafters @ 24" oc	1.51	psf
Batt/blown insul	0.50	psf
1/2" Gypboard	<u>2.50</u>	psf
Load	14.4	psf
Roof Pitch Adjustment	<u>1.70</u>	psf
Total Load	16.1	psf



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Input Data

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FRAME MAC file: truss1.

Last modified at 5:44:20 PM on Wed, Jun 17, 1998.

All coord. and distances are in ft.

There are 7 nodes and 11 elements.

There are 18 degrees of freedom; the half-bandwidth is 17.

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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	8.50	0.00	No	No	No	No
3	16.50	0.00	No	No	No	No
4	25.00	0.00	No	Yes	No	No
5	7.00	3.50	No	No	No	No
6	18.00	3.50	No	No	No	No
7	12.50	6.25	No	No	No	No

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Element characteristics:

From, To Nodes	Length ft	Section name	E psi	Include self wt.	Top is on top or left	Hinged at node(s)
1,5	7.83	J2X4	1700000.00	No	Yes	1
1,2	8.50	J2X4	1700000.00	No	Yes	1
2,3	8.00	J2X4	1700000.00	No	Yes	---
2,5	3.81	J2X4	1700000.00	No	Yes	---
2,7	7.42	J2X4	1700000.00	No	Yes	---
3,4	8.50	J2X4	1700000.00	No	Yes	4
3,7	7.42	J2X4	1700000.00	No	Yes	---
3,6	3.81	J2X4	1700000.00	No	Yes	---
4,6	7.83	J2X4	1700000.00	No	Yes	4
5,7	6.15	J2X4	1700000.00	No	Yes	7
6,7	6.15	J2X4	1700000.00	No	Yes	7

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Element characteristics (continued):

From, To Nodes	Area in**2	Depth in	Thickness in	Weight lb/ft	Weight lb
1,5	5.25	3.50	1.50	1.32	10.33
1,2	5.25	3.50	1.50	1.32	11.22
2,3	5.25	3.50	1.50	1.32	10.56
2,5	5.25	3.50	1.50	1.32	5.03
2,7	5.25	3.50	1.50	1.32	9.79
3,4	5.25	3.50	1.50	1.32	11.22
3,7	5.25	3.50	1.50	1.32	9.79
3,6	5.25	3.50	1.50	1.32	5.03
4,6	5.25	3.50	1.50	1.32	10.33
5,7	5.25	3.50	1.50	1.32	8.12
6,7	5.25	3.50	1.50	1.32	8.12

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Element characteristics (continued):

From, To Nodes	Iz in**4	Sec. mod. in**3	Rad. gyr. in	N.A. -edge in	S,T,L
1,5	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
2,5	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

3,6	5.36	3.06	1.01	1.75	S
4,6	5.36	3.06	1.01	1.75	S
5,7	5.36	3.06	1.01	1.75	S
6,7	5.36	3.06	1.01	1.75	S

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Total frame weight: 99.54 lb.

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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)
1,5	Dead 1	0.00	7.83	0.00	25.00	0.00	25.00
1,5	Live 1	0.00	7.83	0.00	32.00	0.00	32.00
1,2	Dead 1	0.00	8.50	0.00	7.20	0.00	7.20
2,3	Dead 1	0.00	8.00	0.00	7.20	0.00	7.20
3,4	Dead 1	0.00	8.50	0.00	7.20	0.00	7.20
4,6	Dead 1	0.00	7.83	0.00	25.00	0.00	25.00
4,6	Live 1	0.00	7.83	0.00	32.00	0.00	32.00
5,7	Dead 1	0.00	6.15	0.00	25.00	0.00	25.00
5,7	Live 1	0.00	6.15	0.00	32.00	0.00	32.00
6,7	Dead 1	0.00	6.15	0.00	25.00	0.00	25.00
6,7	Live 1	0.00	6.15	0.00	32.00	0.00	32.00

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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

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Output Data  
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FRAME MAC file: truss1.  
Last modified at 5:44:20 PM on Wed, Jun 17, 1998.  
All coord. and distances are in ft from the left (bot.) end of the element.  
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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	886.60	---
4	---	886.60	---

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	-0.10	-0.00
3	0.03	-0.10	0.00
4	0.04	0.00	---
5	0.03	-0.10	0.00
6	0.01	-0.10	-0.00
7	0.02	-0.10	0.00

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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
1,5	0.00	-1616.47	-1616.47	0.00	-307.90	-307.90
1,2	1376.20	0.00	1376.20	262.13	0.00	262.13
2,3	883.42	0.00	883.42	168.27	0.00	168.27
2,5	0.00	-442.23	-442.23	0.00	-84.23	-84.23
2,7	544.76	0.00	544.76	103.76	0.00	103.76
3,4	1376.20	0.00	1376.20	262.13	0.00	262.13
3,7	544.76	0.00	544.76	103.76	0.00	103.76
3,6	0.00	-442.23	-442.23	0.00	-84.23	-84.23
4,6	0.00	-1616.47	-1616.47	0.00	-307.90	-307.90
5,7	0.00	-1413.33	-1413.33	0.00	-269.21	-269.21
6,7	0.00	-1413.33	-1413.33	0.00	-269.21	-269.21

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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
1,5	155.66	-243.34	-243.34	29.65	-46.35	-46.35
1,2	24.46	-36.74	-36.74	4.66	-7.00	-7.00
2,3	28.80	-28.80	-28.80	5.49	-5.49	-5.49
2,5	29.66	0.00	29.66	5.65	0.00	5.65
2,7	0.00	-2.77	-2.77	0.00	-0.53	-0.53
3,4	36.74	-24.46	36.74	7.00	-4.66	7.00
3,7	2.77	0.00	2.77	0.53	0.00	0.53
3,6	0.00	-29.66	-29.66	0.00	-5.65	-5.65
4,6	243.34	-155.66	243.34	46.35	-29.65	46.35
5,7	199.87	-113.63	199.87	38.07	-21.64	38.07
6,7	113.63	-199.87	-199.87	21.64	-38.07	-38.07

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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
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1,5      237.63    -343.09    -343.09    931.90    -1345.47    -1345.47
1,2      41.56     -52.16     -52.16    162.99    -204.54    -204.54
2,3      26.33     -31.27     -31.27    103.25    -122.63    -122.63
2,5      35.02     -77.93     -77.93    137.32    -305.60    -305.60
2,7      14.13      -6.44      14.13     55.41     -25.27     55.41
3,4      41.56     -52.16     -52.16    162.99    -204.54    -204.54
3,7      14.13      -6.44      14.13     55.41     -25.27     55.41
3,6      35.02     -77.93     -77.93    137.32    -305.60    -305.60
4,6      237.63    -343.09    -343.09    931.90    -1345.47    -1345.47
5,7      126.62    -265.17    -265.17    496.57    -1039.87    -1039.87
6,7      126.62    -265.17    -265.17    496.57    -1039.87    -1039.87

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Maximum deflection values:

From, To Node ---	Maximum defl. up (left) inch	Maximum defl. down (rt.) inch	Maximum defl. absolute inch
1,5	0.00	-0.28	-0.28
1,2	0.00	-0.11	-0.11
2,3	0.00	-0.13	-0.13
2,5	0.00	-0.03	-0.03
2,7	0.00	-0.08	-0.08
3,4	0.00	-0.11	-0.11
3,7	0.00	-0.04	-0.04
3,6	0.00	-0.06	-0.06
4,6	0.02	-0.26	-0.26
5,7	0.00	-0.17	-0.17
6,7	0.00	-0.15	-0.15

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**BENDING & COMP: TRUSS 1; MEMBER 1-5**

Grading:

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	7.83 feet	
Max Axial Comp, C	1616 lbs	
Max Reaction, R	243 lbs	
Max Moment, M	343 ft-lbs	
Max LL Deflection	0.13 inches	
Max TL Deflection	0.28 inches	
LL Defl Criteria = L/	240	
TL Defl Criteria = L/	180	↘
Duration factor, Cd	1.25	↘
Repetitive Factor, Cr	1.15	
fc =	308 psi	
Fce=	1041 psi	
Fc*=	1094 psi	
F'c=	737 psi	
fb=	112 psi	
F'b=	1258 psi	
Shear D/C ratio	0.58 < 1.0, Member	OK
Interaction equation:		
(fc/F'c)^2 +		
fb/ (F'b(1-fc/Fce)) =	0.30 < 1.0, Member	OK
Live Load defl ratio	0.33 < 1.0, Member	OK
Total Load defl ratio	0.54 < 1.0, Member	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 feet
Dead load roof	12.5 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	25 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	150 lbs
Live load reaction	192 lbs
Total load reaction	342 lbs

Allowable shear, Fv'	119 psi
Actual shear, fv	57 psi
Allowable bending, Fb'	1635 psi
Actual bending, fb	1628 psi
Allowable live load defl	0.60 inches
Actual live load defl	0.45 inches
Allowable total load defl	0.80 inches
Actual total load defl	0.80 inches
Bearing length req'd	0.36 inches

Horizontal Shear OK  
 Bending OK  
 Live Load Deflection OK  
 Total Load Deflection OK

**BEAM DESIGN FOR UNIFORM LOAD: 2-2x6**

(Values for DF Larch #2)

Width, b	3 inches
Depth, d	5.5 inches
Length of beam	15 feet
Dead load roof	12.5 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	25 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	188 lbs
Live load reaction	240 lbs
Total load reaction	428 lbs

Allowable shear, Fv'	119 psi
Actual shear, fv	36 psi
Allowable bending, Fb'	1635 psi
Actual bending, fb	1272 psi
Allowable live load defl	0.75 inches
Actual live load defl	0.55 inches
Allowable total load defl	1.00 inches
Actual total load defl	0.98 inches

Bearing length req'd 0.23 inches

Horizontal Shear OK

Bending OK

Live Load Deflection OK

Total Load Deflection OK

**BEAM DESIGN FOR UNIFORM LOAD: 2x6 vault**

(Values for DF Larch #2)

Width, b	1.5 inches
Depth, d	5.5 inches
Length of beam	11 feet
Dead load roof	16.1 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	32.2 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	177 lbs
Live load reaction	176 lbs
Total load reaction	353 lbs

Allowable shear, Fv'	119 psi
Actual shear, fv	59 psi
Allowable bending, Fb'	1635 psi
Actual bending, fb	1541 psi
Allowable live load defl	0.55 inches
Actual live load defl	0.32 inches
Allowable total load defl	0.73 inches
Actual total load defl	0.64 inches

Bearing length req'd 0.38 inches

Horizontal Shear OK

Bending OK

Live Load Deflection OK

Total Load Deflection OK

**BEAM DESIGN FOR UNIFORM LOAD:**

(Values for DF Larch #1)

Width, b	5.5 inches
Depth, d	15.5 inches
Length of beam	23.5 feet
Dead load roof	16.1 psf
Live load roof	16 psf
Contributory width of roof load	10.5 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	360
Total load defl ratio	240
Total dead load	169.05 plf
Total live load	168 plf

Base design values:

Shear, $F_v$	85 psi
Bending, $F_b$	1350 psi
Comp. perp. to grain, $F_c$	625 psi
Mod of Elasticity, E	1700000 psi
Load duration factor, $C_d$	1.25
Size Factor, $C_f$	0.97

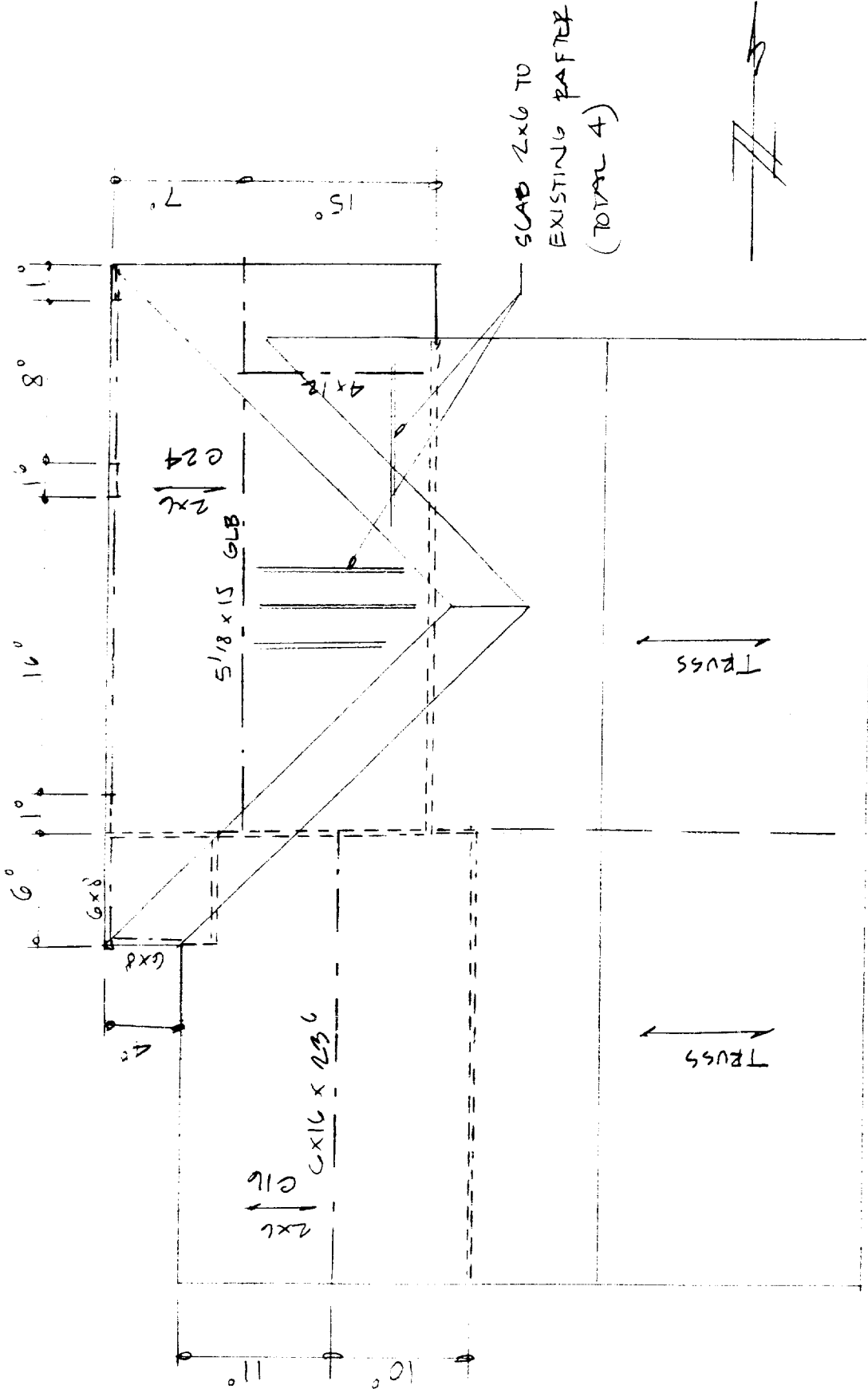
Dead load reaction	1986 lbs
Live load reaction	1974 lbs
Total load reaction	3960 lbs

Allowable shear, $F_v'$	106 psi	Horizontal Shear	OK
Actual shear, $f_v$	62 psi		
Allowable bending, $F_b'$	1640 psi	Bending	OK
Actual bending, $f_b$	1268 psi		
Allowable live load defl	0.78 inches	Live Load Deflection	OK
Actual live load defl	0.40 inches		
Allowable total load defl	1.18 inches	Total Load Deflection	OK
Actual total load defl	0.80 inches		
Bearing length req'd	1.15 inches		

**GLULAM BEAM DESIGN FOR UNIFORM LOAD:**

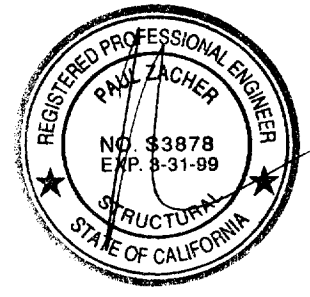
(Values for 24F-V4 DF/DF)

Width	5.125 inches	
Depth	15 inches	
Length of beam	27.5 feet	
Dead load roof	12.5 psf	
Live load roof	16 psf	
Contributory width of roof load	11 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	137.5 plf	
Total live load	176 plf	
Base design values:		
Shear, Fv	165 psi	
Bending, Fb	2400 psi	
Comp. perp. to grain, Fc	650 psi	
Mod of Elasticity, E	1800000 psi	
Load duration factor, Cd	1.25	
Volume factor, Cv	0.95	
Dead load reaction	1891 lbs	
Live load reaction	2420 lbs	
Total load reaction	4311 lbs	
Allowable shear, Fv'	206 psi	Horizontal Shear OK
Actual shear, fv	76 psi	
Allowable bending, Fb'	2856 psi	Bending OK
Actual bending, fb	1850 psi	
Allowable live load defl	1.38 inches	Live Load Deflection OK
Actual live load defl	0.87 inches	
Allowable total load defl	1.83 inches	Total Load Deflection OK
Actual total load defl	1.55 inches	
Camber req'd	1.023 inches	
Bearing length req'd	1.29 inches	



# ROOF PLAN

N.T.S.







DEPARTMENT OF  
PLANNING AND DEVELOPMENT

CITY OF SACRAMENTO  
CALIFORNIA

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SACRAMENTO, CA  
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916-264-7619  
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McCullough  
I Down River  
95831

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 Pioneer Shake tile
2. TILE WEIGHT PER SQUARE 730 lbs
3. WEIGHT OF ROOF SYSTEM PER SQUARE 180
4. TOTAL WEIGHT OF ROOF SYSTEM 910 lbs
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

See attached engineering  
report