CITY OF SACRAMENTO

Permit No: 9807818

1231 I Street, Sacramento, CA 95814

Insp Area: 1

Site Address: 19 LIDO CR SAC
Parcel No: 0790383034

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

CONTRACTOR		***OWNER***		***ARCHITECT***
CARVALHO ROOFING		FRANCIS GEORGE M & BETTY J		
P OB OX 671		19 LIDO CR		
ROCKLIN CA	95677	SACRAMENTO CA	95826	

Nature of Work: STRUCTURAL MODIFICATIONS TO EXISTING ROOF FRAMING SUPPORTING LIGHT WEIGHT TILE ROOFING

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'sAddress_____

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 C 29 39 License Number 614502 Date 8/13/98 Contractor Signature Michael R Carvalho

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 herby authorize representative(s) of this city to enter upon the abovementioned property for inspection purposes.

Date 8/13/98 Applicant/Agent Signature Susan Carvalho

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 Insurance Ins Co Policy Number W98078929

CITY OF SACRAMENTO
AUG 13 1998
PLANNING
NEIGHBORHOOD ASSISTANT SERVICES

____ (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 that, if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

Date 8/13/98 Applicant Signature Susan Carvalho

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

December 4, 1997

Carvalho Roofing
P.O. Box 671
Rocklin, CA 95677
TEL: 916.624-2942
FAX: 916.632.8408

Attn.: Mr. Mike Carvahlo.

re: Job 97222; FRANCIS

Subject: Structural Investigation Report of the Roof for the Residence located 19 Lido Circle, Sacramento, CA 95826

As requested by Mr. Mike Carvahlo, this is a report to determine what needs should be addressed to correct any structural deficiencies of the roof. Paul Zacher visited the site November 26, 1997. The investigation was made to determine the existing condition of the structure.

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 1600 square feet with a first story plate height of 8 feet.

CONSTRUCTION:

Roof:

The roof covering consists of Mission "S" Standard Weight Tile over "infill" skip sheathing. The tile roof was installed in 1991. The living area is conventionally framed with 2x4 rafters spaced at 24" on center with 2x4 purlins supported at no more than 4'-0" on center or 2x6 purlins supported at no more than 6'-0" on center by 2x4 struts bearing on walls below except over the living room. The vaulted ceiling in the living room is constructed of 2x6 rafters spaced at 24" on center. The garage area is framed with 2x4 rafters spaced at 24" on center and 2x6 cross ties spaced at 4'-0" on center.

FINDINGS:

Roof:

The roof structure has been reinforced and substantially complies with the recommendations given in the report by Recher, Dutra and Associates, Structural Engineering, Inc. Deflection (sag) of the rafters is visible in the garage area. The owner also had concern about deflection of the rafters at

John Tang

the North side of the residence near the vaulted ceiling. However, the deflection in this area does not exceed code allowable values.

CONCLUSIONS:

Roof:

Most of the deflection of the rafters occured prior to the placement of the tile as many of the existing rafters were either overspanned, inadequately braced or both. However, the current deflection of the rafters does not compromise the structural integrity of these members as long as they are adequately braced to prevent further displacement.

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. Add a 1/2" OSB gusset plate adjacent to the existing strut and rafter connection and attach it with 8d's at 6" on center at the edges. See details 1 and 2.
2. Provide additional 2x4 struts from the purlins to the bearing walls below. The minimum slope of the struts shall not be less than 45 degrees from the horizontal. See detail 1.
3. Scab a 2x6 rafter adjacent to the existing 2x4 rafters where the span is greater than 7'-6" with 16d's @ 12" on center. See detail 1.

Garage

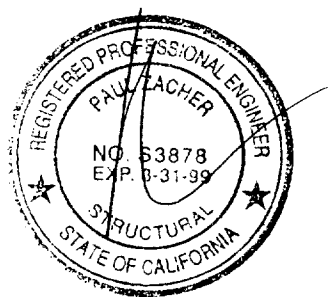
4. Provide 2x4 kickers from the rafters to the double 2x12 below where the span of the existing rafters exceed 7'-6". See detail 1.
5. Provide a ledger to support the 2x12 purlin at the rear of the garage. The ledger shall be 2x12 x 16" long attached to the studs with 14 - 16d's. See detail 1.

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

MATERIAL	WEIGHT	
Monier Mission "S" Std. Wt.	9.50	psf
Roofing felt	0.30	psf
"Infill" 1x4 skip sht'g	2.19	psf
2x4 rafters @ 24" oc	0.64	psf
Load	12.6	psf
Roof Pitch Adjustment	0.68	psf
Total Load	13.3	psf

LOCATION: VAULT

MATERIAL	WEIGHT	
Monier Mission "S" Std. Wt.	9.50	psf
Roofing felt	0.30	psf
"Infill" 1x4 skip sht'g	1.09	psf
2x6 rafters @ 24" oc	1.00	psf
Batt blown insul	0.50	psf
1/2" Gypboard	2.50	psf
Load	14.9	psf
Roof Pitch Adjustment	0.81	psf
Total Load	15.7	psf

BEAM DESIGN FOR UNIFORM LOAD: RAFTER

(Values for DF Larch #2)			
Width, b	1.5	inches	
Depth, d	3.5	inches	
Length of beam	7.68	feet	
Dead load roof	13.3	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	26.6	plf	
Total live load	32	plf	
Base design values:			
Shear, Fv	95	psi	
Bending, Fb	1000	psi	
Comp. perp. to grain, Fc	625	psi	
Mod of Elasticity, E	1700000	psi	
Load duration factor, Cd	1.25		
Size Factor, Cf	1.50		
Repetitive factor, Cr	1.15		
Dead load reaction	102	lbs	
Live load reaction	123	lbs	
Total load reaction	225	lbs	
Allowable shear, Fv'	119	psi	Horizontal Shear OK
Actual shear, fv	59	psi	
Allowable bending, Fb'	2156	psi	Bending OK
Actual bending, fb	1693	psi	
Allowable live load defl	0.38	inches	Live Load Deflection OK
Actual live load defl	0.27	inches	
Allowable total load defl	0.51	inches	Total Load Deflection OK
Actual total load defl	0.50	inches	
Bearing length req'd	0.24	inches	

BEAM DESIGN FOR UNIFORM LOAD: VAULT

(Values for DF Larch #2)

Width, b	1.5 inches	
Depth, d	5.5 inches	
Length of beam	10.5 feet	
Dead load roof	15.7 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	360	
Toal load defl ratio	240	
Total dead load	31.4 plf	
Total live load	32 plf	
Base design values:		
Shear, Fv	95 psi	
Bending, Fb	1000 psi	
Comp. perp. to grain, Fc	625 psi	
Mod of Elasticity, E	1700000 psi	
Load duration factor, Cd	1.25	
Size Factor, Cf	1.30	
Repetitive factor, Cr	1.15	
Dead load reaction	165 lbs	
Live load reaction	168 lbs	
Total load reaction	333 lbs	
Allowable shear, Fv	119 psi	Horizontal Shear OK
Actual shear, fv	55 psi	
Allowable bending, Fb'	1869 psi	Bending OK
Actual bending, fb	1386 psi	
Allowable live load defl	0.35 inches	Live Load Deflection OK
Actual live load defl	0.25 inches	
Allowable total load defl	0.53 inches	Total Load Deflection OK
Actual total load defl	0.49 inches	
Bearing length req'd	0.36 inches	

COMPOSITE DESIGN, WOOD MEMBER WITH WOOD SIDE PLATE

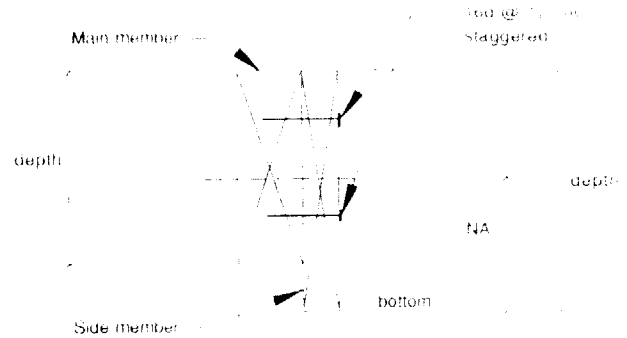
Main member:

Allow shear, Fv	95 psi
Allow bend, Fb =	875 psi
Mod of Elasticity	1700000 psi

Side plate member:

Allow shear, Fv =	95 psi
Allow bend, Fb	1000 psi
Mod of Elasticity =	1700000 psi

Max shear =	0 lbs
Max moment	0 ft lbs
Load duration factor, Cd	1.25
fv	0.0 psi
fb, top	0 psi
fb, bottom	0 psi



	Width (in)	Depth (in)	Area (in^2) (incl n value)	Y (in), Meas. from bottom up	ΣAY	Ioo (in^4)	Ad^2	Ioo + Ad^2
2x12	1.50	11.25	16.88	5.625	94.92	177.98	15.04	193.02
2x6	1.50	5.50	8.25	8.500	70.13	20.80	30.76	51.56
			25.13		165.05	198.78	45.80	244.58

NA=ΣAY/ΣA = 6.57 as measured from the bottom up

S top = 52.25

S bottom = 37.23

Y = the neutral axis of the member

NA = combined neutral axis of the main member plus the side plate

Static Moment, Q = [NA-Y of the side plate]

	Y (in)	A (in^2)	Q (in^3)=YA
Static Moment of Plate, Q	1.78	8.25	14.69

	End point	1/8 point	1/4 point	3/8 point	1/2 point
Shear, V (lb) =	0	0	0	0	0
Horiz t (lb/in) =	0	0	0	0	0

where t= VQ/I

BEAM DESIGN FOR UNIFORM LOAD: PURLIN

(Values for DF Larch #2)

Width, b	1.5 inches	Properties used are those for
Depth, d	11.25 inches	the combined 2x6 & 2x12
Length of beam	10.83 feet	
Dead load roof	13.3 psf	
Live load roof	16 psf	
Contributory width of roof load	9 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	119.7 plf	
Total live load	144 plf	

Base design values:		
Shear, Fv	95 psi	
Bending, Fb	1000 psi	
Comp. perp. to grain, Fc	625 psi	
Mod of Elasticity, E	1700000 psi	
Load duration factor, Cd	1.25	
Size Factor, Cf	1.00	
Repetitive factor, Cr	1.00	
Dead load reaction	648 lbs	
Live load reaction	780 lbs	
Total load reaction	1428 lbs	
Allowable shear, Fv'	119 psi	Horizontal Shear OK
Actual shear, fv	105 psi	
Allowable bending, Fb'	1250 psi	Bending OK
Actual bending, fb	1246 psi	
Allowable live load defl	0.54 inches	Live Load Deflection OK
Actual live load defl	0.11 inches	
Allowable total load defl	0.72 inches	Total Load Deflection OK
Actual total load defl	0.20 inches	
Bearing length req'd	1.52 inches	

BEAM DESIGN FOR UNIFORM LOAD: GARAGE RAFTER

(Values for DF Larch #2)		
Width, b	1.5 inches	
Depth, d	3.5 inches	
Length of beam	11 feet	
Dead load roof	10.1 psf	
Live load roof	0 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	20.2 plf	
Total live load	0 plf	
Base design values:		
Shear, Fv	95 psi	
Bending, Fb	1000 psi	
Comp. perp. to grain, Fc	625 psi	
Mod of Elasticity, E	1700000 psi	
Load duration factor, Cd	1.25	
Size Factor, Cf	1.50	
Repetitive factor, Cr	1.15	
Dead load reaction	111 lbs	
Live load reaction	0 lbs	
Total load reaction	111 lbs	
Allowable shear, Fv	119 psi	Horizontal Shear OK
Actual shear, fv	30 psi	
Allowable bending, Fb'	2156 psi	Bending OK
Actual bending, fb	1197 psi	
Allowable live load defl	0.55 inches	Live Load Deflection OK
Actual live load defl	0.00 inches	
Allowable total load defl	0.73 inches	Total Load Deflection OK
Actual total load defl	0.73 inches	
Bearing length req'd	0.12 inches	

BEAM DESIGN FOR UNIFORM LOAD: GARAGE PURLIN

Values for DF Larch #2)			
Width, b	1.5	inches	
Depth, d	11.25	inches	
Length of beam	13	feet	
Dead load roof	3.2	psf	Includes contribution from
Live load roof	16	psf	2x4 rafter
Contributory width of roof load	7.75	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	24.8	plf	
Total live load	124	plf	
Base design values:			
Shear, Fv	95	psi	
Bending, Fb	1000	psi	
Comp. perp. to grain, Fc	625	psi	
Mod of Elasticity, E	1700000	psi	
Load duration factor, Cd	1.25		
Size Factor, Cf	1.00		
Repetitive factor, Cr	1.00		
Dead load reaction	161	lbs	
Live load reaction	806	lbs	
Total load reaction	967	lbs	
Allowable shear, Fv'	119	psi	Horizontal Shear OK
Actual shear, fv	74	psi	
Allowable bending, Fb'	1250	psi	Bending OK
Actual bending, fb	1192	psi	
Allowable live load defl	0.65	inches	Live Load Deflection OK
Actual live load defl	0.26	inches	
Allowable total load defl	0.87	inches	Total Load Deflection OK
Actual total load defl	0.32	inches	
Bearing length req'd	1.03	inches	

PAUL ZACHER - STRUCTURAL ENGINEERS
4701 LAKESIDE WAY
FAIR OAKS, CA 95628
TEL: 916.961.3938
FAX: 916.961.3938

Title :
Dsgnr:
Description :

Job #
Date: 3:48PM, 5 DEC 97

Scope :

General Timber Beam

Description GARAGE BEAM

General Information

Section Name	2-2x12	Center Span	22.00 ft	.....Lu	0.00 ft
Beam Width	3.000 in	Left Cantilever	ft	.....Lu	0.00 ft
Beam Depth	11.250 in	Right Cantilever	ft	.....Lu	0.00 ft
Member Type	Sawn	Douglas Fir - Larch, No.1			
		Fb Allow	1,000.0 psi		
Load Dur Factor	1.250	Fv Allow	95.0 psi		
Beam End Fixity	Pin-Pin	Fc Allow	625.0 psi		
		E	1,700.0 ksi		

Point Loads

Dead Load	161.0 lbs	161.0 lbs	lbs	lbs	lbs	lbs
Live Load	806.0 lbs	806.0 lbs	lbs	lbs	lbs	lbs
..distance	7.000 ft	15.000 ft	0.000 ft	0.000 ft	0.000 ft	0.000 ft

Summary

Overstressed in Bending !

Span= 22.00ft, Beam Width = 3.000in x Depth = 11.25in, Ends are Pin-Pin

Max Stress Ratio	1.027 : 1		
Maximum Moment	6.8 k-ft	Maximum Shear * 1.5	1.5 k
Allowable	6.6 k-ft	Allowable	4.0 k

Max. Positive Moment	6.77 k-ft	at 14.960 ft	Shear:	@ Left	0.97 k
Max. Negative Moment	0.00 k-ft	at 22.000 ft		@ Right	0.97 k
Max @ Left Support	0.00 k-ft		Camber:	@ Left	0.000 in
Max @ Right Support	0.00 k-ft			@ Center	0.253 in
Max M allow	6.59			@ Right	0.000 in
fb 1,283.60 psi	fv 42.98 psi		Reactions...		
Fb 1,250.00 psi	Fv 118.75 psi		Left DL	0.16 k	Max 0.97 k
			Right DL	0.16 k	Max 0.97 k

Deflections

Center Span...	Dead Load	Total Load	Left Cantilever...	Dead Load	Total Load
Deflection	-0.168 in	-1.012 in	Deflection	0.000 in	0.000 in
Location	11.000 ft	11.000 ft	...Length/Defl	0.0	0.0
Length/Defl	1,567.5	260.99	**Right Cantilever...**		
			Deflection	0.000 in	0.000 in
			...Length/Defl	0.0	0.0

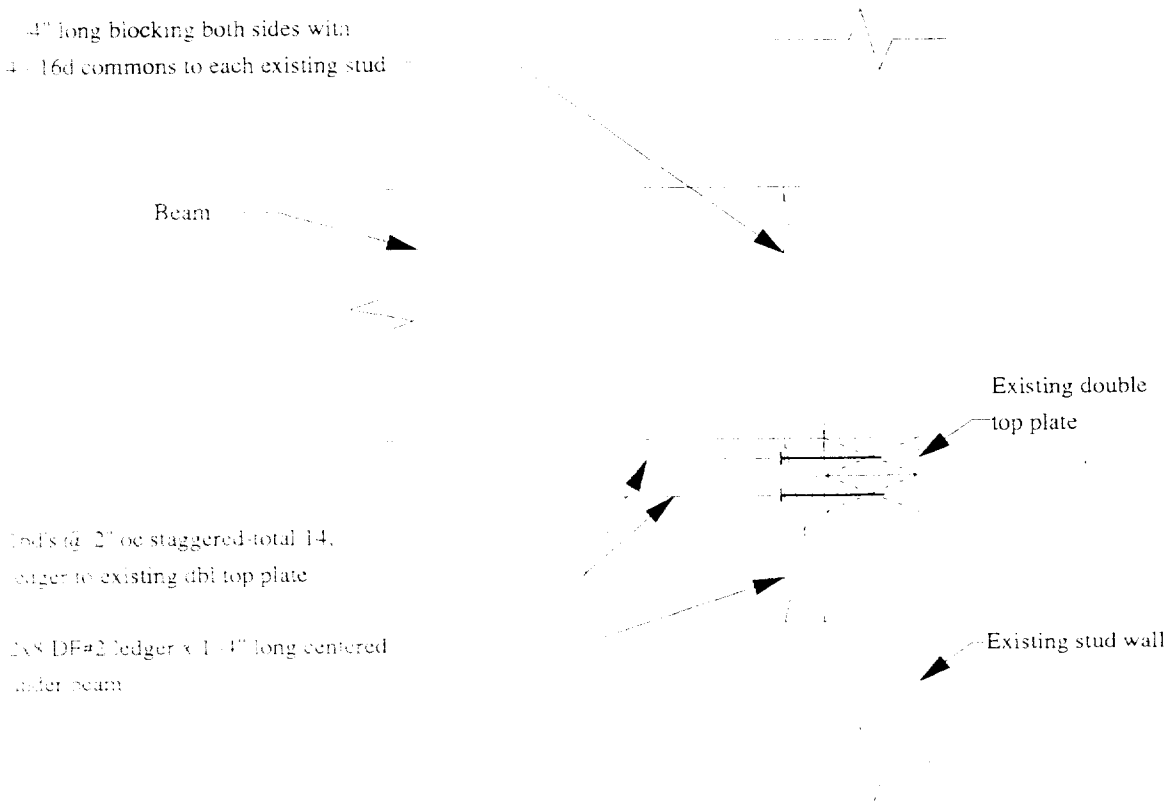
LEDGER DESIGN:

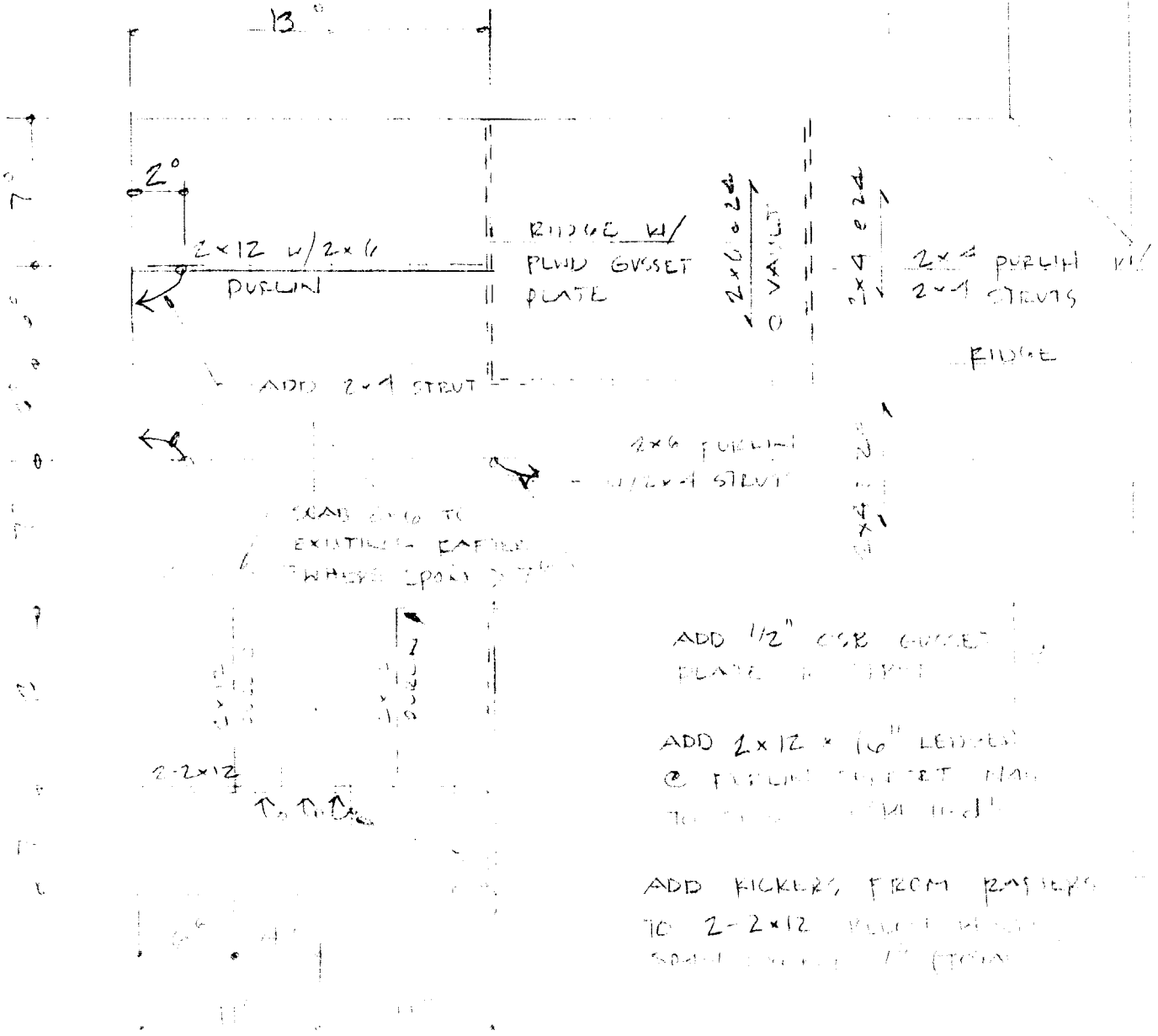
WOOD TO WOOD CONNECTION: Ledger to double top plate

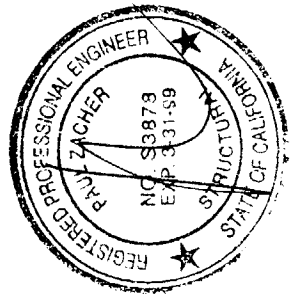
Assumptions:

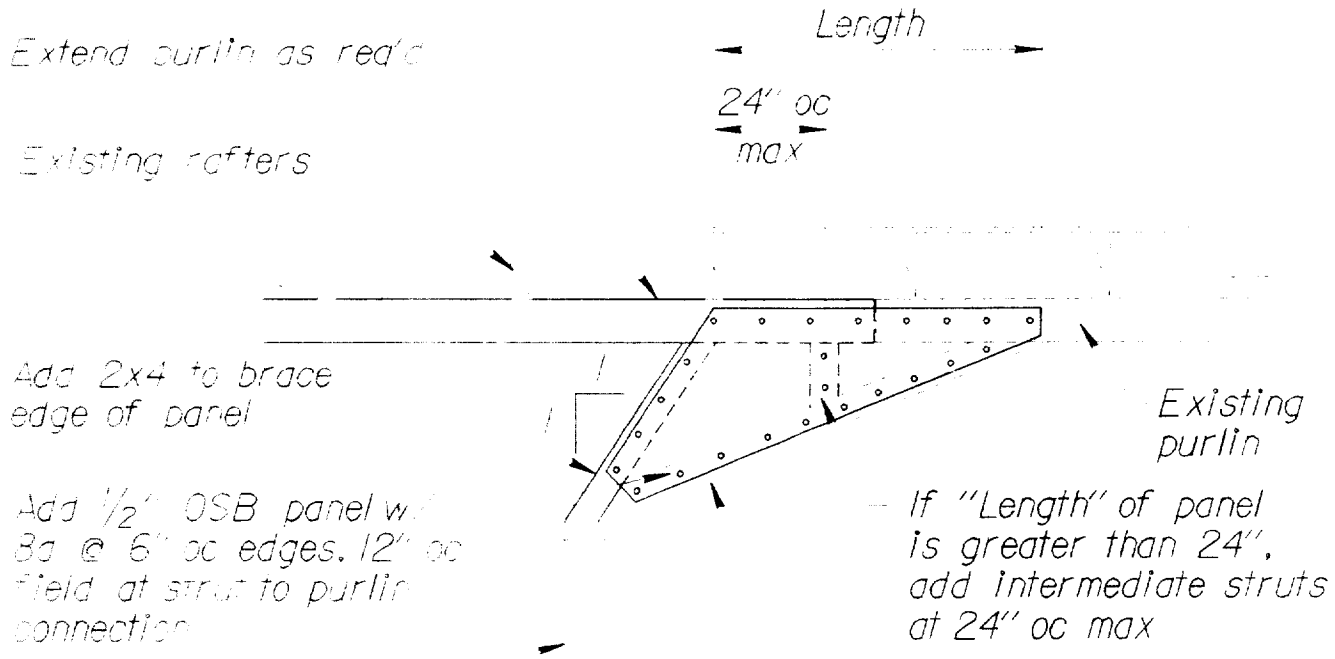
1. Point load from beam is equally distributed to each supporting stud.
2. Allowable foundation pressure is 1000 plf

Ledger width, b	1.5	inches	
Ledger depth, d	7.25	inches	
Maximum reaction	1143	lbs	
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	1.20		
Allowable shear, Fv'	119	psi	Horizontal Shear OK
Actual shear, fv	63	psi	
Allowable bending, Fb'	1313	psi	Bending OK
Actual bending, fb	174	psi	
Length of ledger required	1.143	feet	
Length of ledger used	1.33	feet	
Number of nails required	14	16d sinkers ledger to top plate	




13°
2°
2×12 w/2×6
PURLIN
RIDGE W/
PLATE GUSSET
PLATE
2×6 @ 24" VALLEY
2×4 @ 24"
2×4 PURLIN W/
2×4 STRUTS
RIDGE
ADD 2×4 STRUT
2×6 PURLIN
W/2×4 STRUT
2-2×12
ADD 1/2" OSB GUSSET
ADD 2×12 × 16" LEDGER
ADD KICKERS FROM PURLINS
TO 2-2×12


REGISTERED PROFESSIONAL ENGINEER
PAUL ZACHER
NO. 33879
EXP. 3-31-99
STRUCTURAL
STATE OF CALIFORNIA



NOTE:
Add 2x4 shims as req'd w/ 16d @ 8" oc to existing member

2 GUSSET PLATE DETAIL

NO SCALE