

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

**Permit No: 0107662**  
**Insp Area: 2**

**Site Address: 114 NORTHLITE CR SAC**  
Parcel No: 030-0540-004

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

**CONTRACTOR**  
RIVERA ROOFING  
13975 FLAGSTAFF DR  
SLOUGHOUSE CA 95683

**OWNER**  
BRIGHT  
114 NORTHLITE CIR  
SACRAMENTO, CA 95831

**ARCHITECT**

**Nature of Work: REROOF, TEAR-OFF OLD TILE, RESHEET, INSTALL 47 SQ HEAVY WEIGHT 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 \_\_\_\_\_ License Number 706968 Date 6/18/01 Contractor 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: PERMITS DEPARTMENT  
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 above-mentioned property for inspection purposes.

Date 6/18/01 Applicant/Agent 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 AMERICAN CASUALTY INS Policy Number WC-247859437 Exp Date 09/01/2001

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

Date 6/18/01 Applicant 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.**

**ISSUED**  
~~AUG 3 2001~~  
Sacramento Building Division  
**ISSUED**

SCHOEN ENGINEERING

9524 BEDINGTON WAY  
SACRAMENTO, CA 95827  
Licensed by the California State  
Board for Engineers and Land Surveyors  
(916) 369-6866  
LIC.# C042913



AUG 03 2001

July 31, 2001

Sacramento Building Division  
Bill Bright  
2586 King Richard Drive  
El Dorado Hills, CA 95762

*John* 8/3/01

SUBJECT: Structural roof inspection for the duplex @ 114 Northlite Circle

Bill:

PL# 0107662

On July 11th and July 13<sup>th</sup> 2001 I inspected the roof structure of the duplex at the above mentioned address for the purpose of determining the integrity of the roof structure. The roof was made up of an area with a 4:12 roof slope with 2x6 rafters D.F. no. 2 rafters @ 2' o.c. from the exterior wall plates in about 12'(maximum span was 11'-8" except for one area in the garage facing Northlite Circle where it was 14'-6"). At this point there was a 2x10 rim joist that supported the rafters from the slope roof as well as the joists from a flat roof in the interior section of the building that was framed with 2x8 joists @ 16" o.c.. The rim joist was braced off of the load bearing walls in the attic areas. The original roofing on the sloped portion was standard weight tile supported on skip sheathing, and the roofing on the flat section was hot mopped. The tile on the sloped section had been removed and was being replaced after solid sheathing(OSB) with felt and battens had been installed.

I noticed that at one point on the East side of the building over the Northlite unit there was a brace to the rim joist that was broken, and there was a definite sag in the rim joist there. Also, to the South of the brace there was a site built "A" frame carpenter's truss that spanned about 14' that was not adequate to support the roof loads. This long span with inadequate support was likely the cause of the brace breaking. It is not possible to tell when the break occurred but the support condition were such that there would likely have been a sag in the roof along the rim joist in this area.

In the garage facing Northlite Circle the rim joist was supported by 2x4 braces off of the ties running front to back. The conventional construction provisions of the Uniform Building Code requires that any roof support structure be braced off of bearing walls(engineered beams or other supports would be required otherwise). These ties had a very pronounced sag which is easily visible when you enter the garage from the living area. While there is mention in the home inspection report by Ken Ives of a sag in the roof of the Northlite garage there is no recommendation for any repair or further investigation into the cause of the sag.

The following modifications should be made to the roof structure to insure the structural integrity of the roof:

- \* Some of the 2x4 braces to the rim joist are constructed so the brace runs to the side of the joist and is nailed to it with a block nailed to the brace just under the joist. This is inadequate and should be redone so that the rim joist bears directly on a full length 2x4 that extends full length from the bottom of the joist to the bearing wall. Also additional braces should be installed to insure the span of the rim joist between supports is no more than 7' (see sketch for bracing details).

\* In the area where the carpenter truss supports the rim joist and the brace has broken, a 1-3/4"x14" Microlam beam should be installed under the rim joist to provide adequate support. The Microlam should be supported off of the interior bearing walls that the existing braces are supported off of (see plan for location and sketch for details).

\* In the garage facing Coachlite the intersection of the valley rafters and the ridge needs to have support. Install a 1-3/4"x14" Microlam beam in this area and support it off of the side walls of the garage. The valley and hip rafters as well as the ridge board can then be braced off of the Microlam (see plan for location and sketch for details).

\* In the garage facing Northlite a beam consisting of 2(two)- 1-3/4"x14" Microlams should be installed between the front wall of the garage and the back wall. Then a second beam consisting of 2(two)- 1-3/4"x14" Microlams should be installed between the first beam and the exterior side wall of the garage. The rim joist, hip rafters and the valley rafters should then be braced off of the second beam (see plan for location and sketch for details).

\* The longer rafters in the front slope of the Northlite garage roof should be supported by a 2x6 purlin installed about 11' in from the front wall plate and braced at no more than 6' o.c. from the new beams and the fire wall of the garage (see plan for location and sketch for details).

I certify that this structure is adequate for the installed roof given the above mentioned modifications are completed.

**NOTE: it is possible when reroofing that the increased and or changing load to structural elements also supporting wall, ceiling and floor finishes could cause some minor cosmetic cracking of these finishes. This is typical of wood framed structures and does not of itself indicate structural inadequacy of these members.**

**This report deals with the structural adequacy of roof supporting members that were readily observable. It does not address any structure that was covered by wall finishes, buried in the ground or was otherwise not observable. Any such structures were assumed to conform to standard construction specifications in the Uniform Building Code. Also, it does not address any existing deflection or warping of roof surfaces, nor is it guaranteed that any structural modifications that may be listed in this report will remove such deflections or warping. The repair of such deflections or warping to improve architectural appearance is at the option of the building owner and the roofing contractor.**

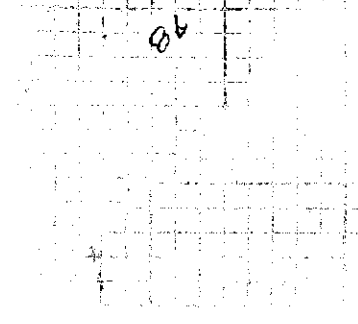
I would like to thank you for allowing me to provide my services in this matter. Please let me know if I may be of further assistance.

Sincerely,

  
Mark S. Schoen P.E.

MSS:mss  
S-ENG-2001\BB001

86



2x10 RIM JOIST  
 SIMPSON ANGLE BETWEEN  
 INCREASING RIM JOIST @ 4' O.C.

2x6 RAFTERS  
 2' O.C.

15/16" STRIP  
 TIE W/ S  
 10 TO  
 RAFTER  
 RIM JOIST

2x8 RAFTERS  
 16" O.C.

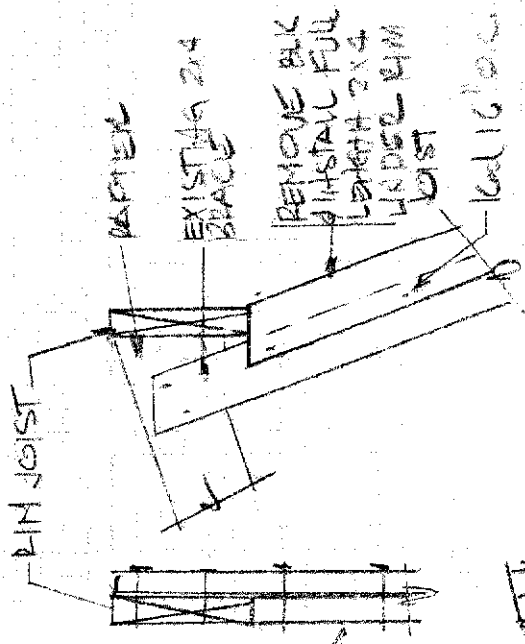
3/4" x 14" MICROLAN  
 MICROLAN TO EXTEND  
 1' BEYOND SUPPORTS

DOUBLED 2x4 BRACE NAILLED  
 TO CENTER W 2-16d BR NAIL &  
 16d 12" O.C.  
 ALSO 4-16d TO MICROLAN & 2-16d  
 TO RIM JOIST

4-16d DETAILS

CRUISE RATE  
 BE LOWD BEACON  
 WALL

RIM JOIST SUPPORT



DOUBLED  
 2x4 BRACE  
 W/ 16d 16"  
 O.C. &  
 2-16d TO  
 RIM JOIST

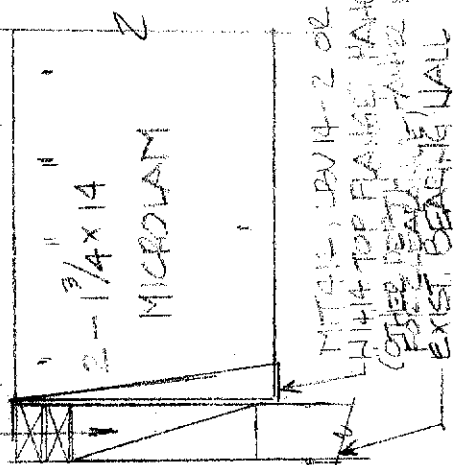


RIM JOIST BRACE DETAILS



NOTE: 4x4 POSTS MAY BE USED IN LUGS ON MICROLAM.

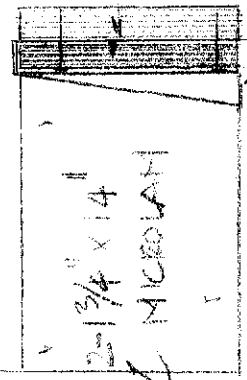
4x8, 4x10, OR 4x12 BLOCK BETWEEN STUDS TO PROVIDE BACKING FOR HANGER. HAIL W/ 6-16d COMMON NAILS FROM STUDS TO BLOCK.



MITERS, LB14-2 OR #14 TOP FLANGE HANGER (OTHER BEARING WALLS MAY BE USED).

MICROLAM BEAM SUPPORT @ BEARING WALL

NOTE: BEAM MAY BE SUPPORTED ON HANGER AS SHOWN HERE OR RATED ON TOP OF PLATE AS IN THE

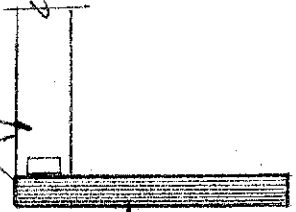


MICROLAM SUPPORT @ CARRY BEAM

SUPPORT BEAMS FOR GARAGE ON HOUGHTON CR.

2x4 BRACE FOR RAFTER, RIDGE, VALLEY OR HIP RAFTER NOTCHED & ANCHORED W/ A24 CLIP

45° OR LESS



BRACE TOP OF MICROLAM @ 4' O.C. FROM OTHER STRUCTURE & ANCHOR W/ A24

NOTE: BRACE MAY TIE IN FROM THE SIDE OR GO OVER THE TOP OF THE MICROLAM

MICROLAM

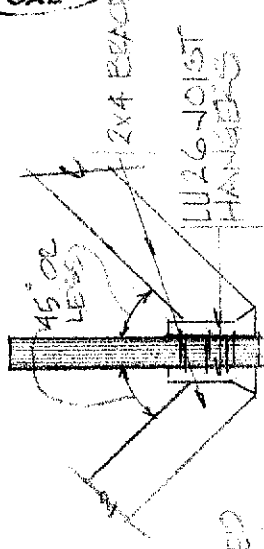
30° OR LESS

2x4 BRACE

L126 JOIST HANGER W/ 6-16d TO MICROLAM

MICROLAM

2x4 BRACES MAY BE DOUBLED W/ ROULEE HANGERS



2-1/4 x 14 MICROLAMS LAMINATED W/ 2-ROWS 16d NAILS 12" O.C. STAGGERED (TYPICAL)

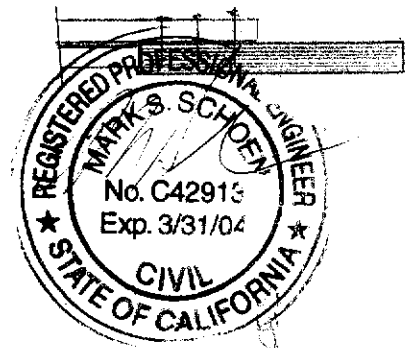
#14-2 OR #14 TOP FLANGE HANGER

BRACE TO MICROLAM DETAILS

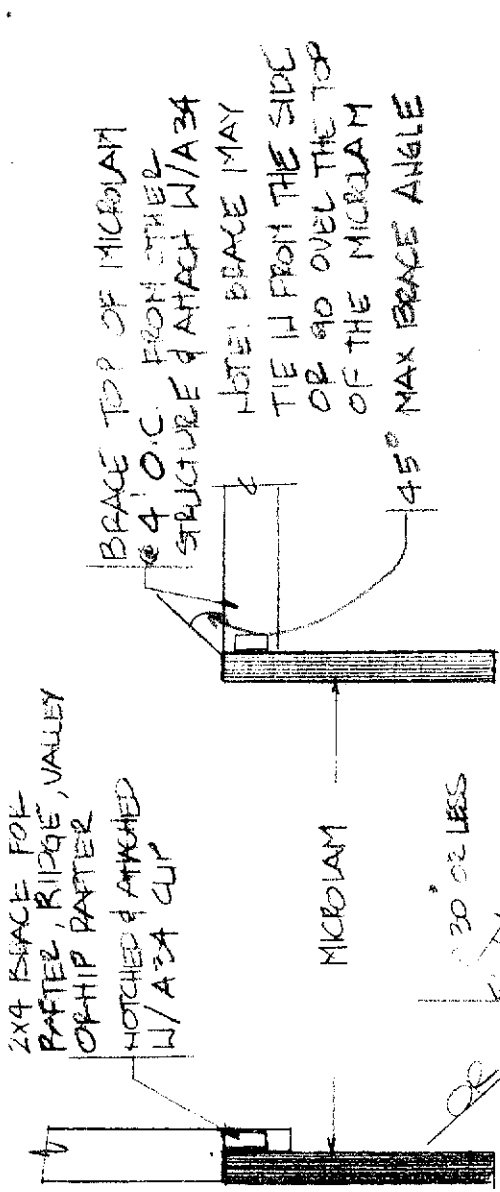
NOTE: AS WITH PLEDS AND RIDGE BRACES, VALLEY & HIP RAFTER BRACES SHOULD PROVIDE DIRECT BEARING SUPPORT. (SEE PLEDS BRACE DETAILS)

NOTE:

(SINGLE MICROLAM SHOWN, BRACE CONNECTIONS WITH DOUBLED MICROLAM SIMILAR.)



(NOTE: IT MAY NOT BE NECESSARY TO USE ALL DETAILS)



BRACE TOP OF MICROLAM  
 @ 4' O.C. FROM OTHER  
 STRUCTURE & ATTACH W/A 2x4

NOTE: BRACE MAY  
 TIE IN FROM THE SIDE  
 OR GO OVER THE TOP  
 OF THE MICROLAM

45° MAX BRACE ANGLE

2x4 BRACE FOR  
 RAFTER, RIDGE, VALLEY  
 OR HIP RAFTER  
 NOTCHED & ATTACHED  
 W/A 2x4 CUP

MICROLAM

30° OR LESS

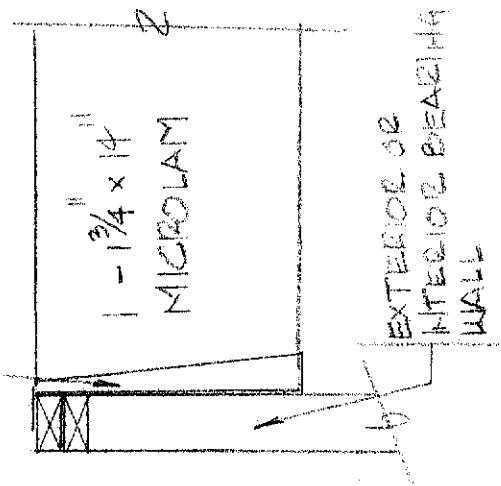
2x4 BRACE

1 1/2" JOIST  
 HANGER 4/8" x 1/2"

MICROLAM

NOTE: AS WITH PURLIN AND  
 RIDGE BRACES, VALLEY & HIP  
 RAFTER BRACES SHOULD  
 PROVIDE DIRECT BEARING SUPPORT  
 (SEE PURLIN BRACE DETAILS)

SIMPSON BIT LEV 14  
 OR WIP IT TOP FLANGE  
 JOIST HANGER



1 - 3/4" x 14"  
 MICROLAM

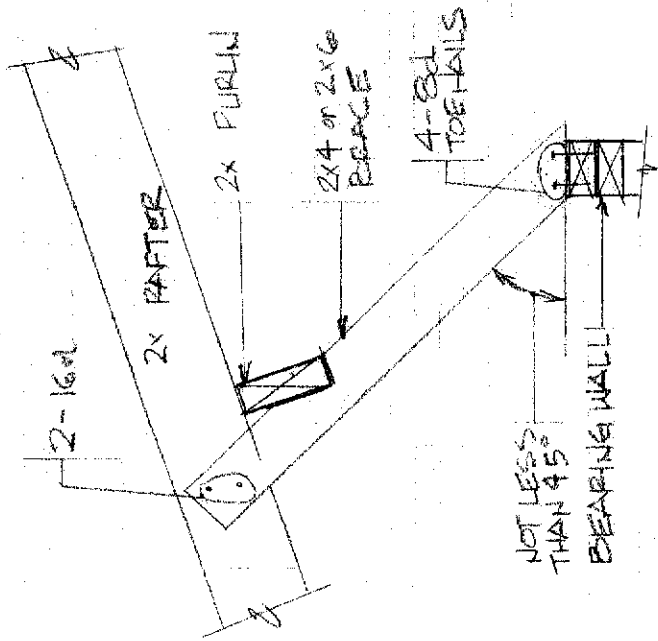
EXTERIOR OR  
 INTERIOR BEARING  
 WALL

BRACE SUPPORT  
@ MICROLAM

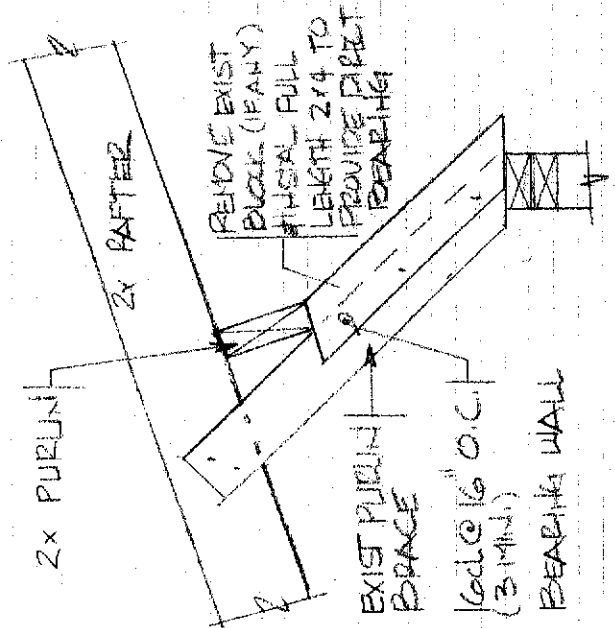
MICROLAM SUPPORT @  
BEARING WALL



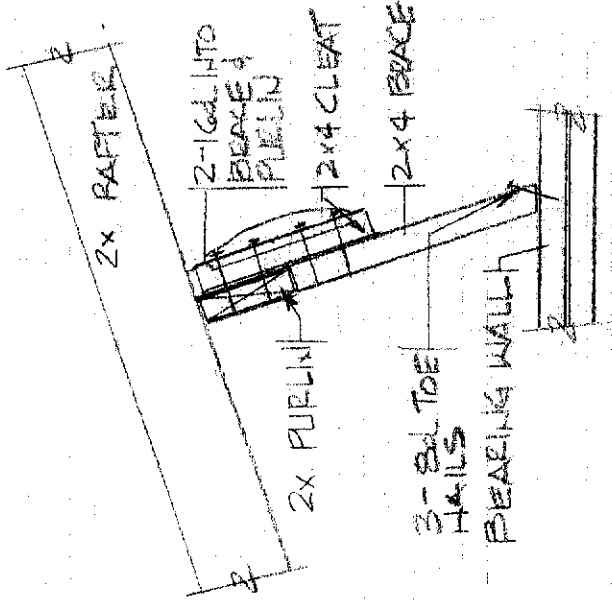
SUPPORT FROM BEARING WALL



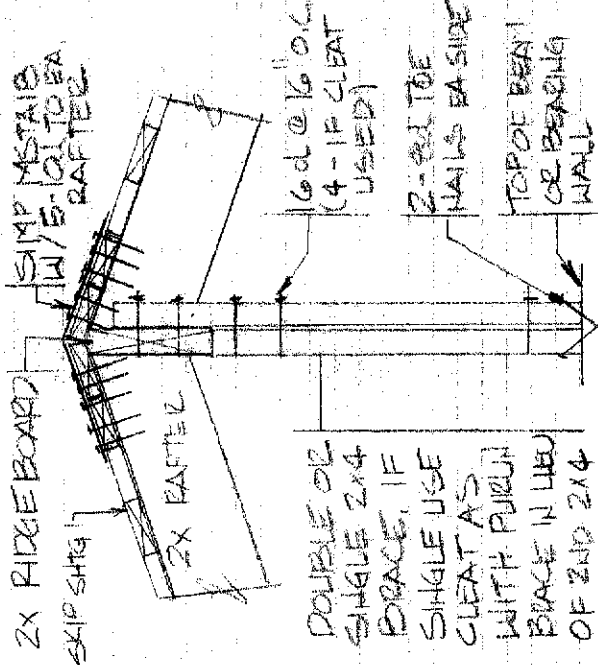
NOTCHED PURLIN BRACE



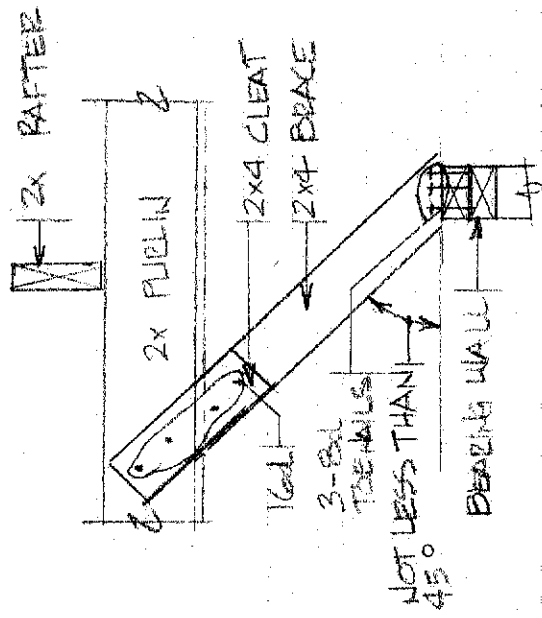
EXISTING BRACE MODIFIED FOR DIRECT BEARING



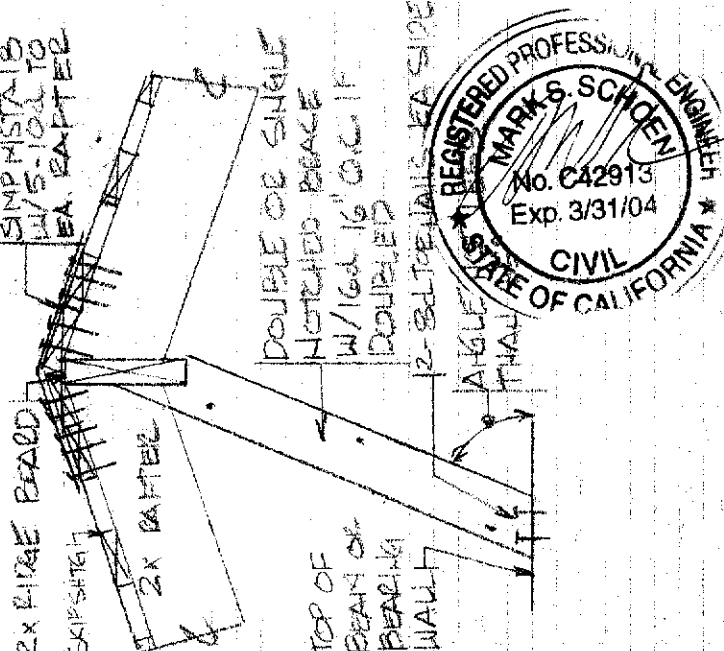
CLEATED PURLIN BRACE (END VIEW)



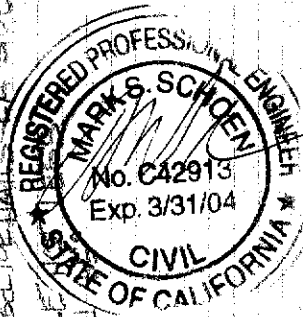
RIDGE BRACE W/ BEARING WALL DIRECTLY UNDER RIDGE



CLEATED PURLIN BRACE (SIDE VIEW)



HOTCHED RIDGE BRACE W/ BEARING WALL DISPLACED TO SIDE OF RIDGE



NOTE: BRACE MAY LEAN IN LINE W/ RIDGE BUT @ ANGLE NOT FLATTER THAN 45°





SCHOEN ENGINEERING

Client: Bill Bright

Date: 7/11/2001

Job No.: BB001

Job Title: Roof Structure reinforcing for 114 Northlite Circle and 6830 Coachlite Way  
Sacramento, CA 95831

Calculation for the required section modulus and moment of inertia for simple span wood beams. Dead load(dl) and Live load(ll) are in pounds per square ft., Spans(l) and Tributary load length or spacing(sp) are in ft., Section moduli are in inches cubed and Moments of inertia are in inches to the 4th power. Allowable stress (Fy) is in lbs./sq.in. per Manufacturer's specifications. Section modulus shape factor reduction and load modification are per U.B.C. 1997 edition .

MICROLAM BEAM SUPPORT FOR RIM JOIST:

$$\begin{aligned}
 rdl &:= 15 & rll &:= 20 & rta &:= \frac{14 + 12}{2} & l &:= 14 \\
 fdl &:= 8 & fl &:= 40 & fta &:= \frac{0}{12} & rta \cdot l &= 182 \\
 Wdl &:= 11.875 \cdot \frac{3.5}{144} \cdot 35 & Wdl &= 10.102 & E &:= 1900000 & Fb &:= 2600 \cdot 1.25
 \end{aligned}$$

$$wt := rta \cdot (rdl + rll) + fta \cdot (fdl + fl) + Wdl$$

$$S \text{ min. required} = \frac{(wt) \cdot l^2 \cdot 1.5}{Fb} = 42.074$$

$$I \text{ min. required} = \frac{5 \cdot (wt) \cdot \frac{(1 \cdot 12)^4}{12 \cdot 384 \cdot E \cdot l \cdot \frac{12}{240}}}{12 \cdot 384 \cdot E \cdot l \cdot \frac{12}{240}} = 302.267$$

Use 1-3/4"x14" MicroLam beam:

$$\begin{aligned}
 w &:= 1.75 & d &:= 14 & Cf &:= \left(\frac{12}{d}\right)^{\frac{1}{9}} \\
 S &:= Cf \cdot w \cdot \frac{d^2}{6} & I &:= w \cdot \frac{d^3}{12}
 \end{aligned}$$

S = 56.196 > 42      I = 400.167 > 302      therefore 1-3/4"x11.875" MLB is O.K.

CHECK MAXIMUM ALLOWABLE SPACING BETWEEN SUPPORTS FOR 2X10 RIM JOIST

$E_w := 1700000$        $F_b := 1450$        $C_d := 1.25$        $C_f := 1$        $C_r := 1$

$F_{bp} := F_b \cdot C_d \cdot C_f \cdot C_r$        $F_{bp} = 1812.5$

-----  
 2x10 Douglas fir No. 2:  
 -----

$b := 1.5$        $d := 9.25$

$I_{x2x10} := b \cdot \frac{d^3}{12}$        $I_{x2x10} = 98.932$        $S_{x2x10} := b \cdot \frac{d^2}{6}$        $S_{x2x10} = 21.391$        $Stiff_{2x10} := I_{x2x10} \cdot E_w$

Check maximum span based on deflection limit of L/240 for rafters w/ceiling  
 L/180 for rafters w/o ceiling:

(Note: The formula used to calculate allowable span for deflections is based on a two span continuous beam where rafters are continuous over a midspan purlin with live load on one span only and dead load on both spans otherwise it is based on a simple span condition)

$$L_{maxd} := \left( \frac{77 \cdot Stiff_{2x10}}{1 \cdot 180 \cdot \frac{wt}{12}} \right)^{\frac{1}{3}} \cdot \frac{1}{12} \qquad L_{maxd} = 10.242$$

Check for maximum span based on stresses:

$$L_{maxs} := \sqrt{F_{bp} \cdot 8 \cdot \frac{S_{x2x10}}{\frac{wt}{12}}} \cdot \frac{1}{12} \qquad L_{maxs} = 7.455$$

MICROLAM GARAGE ROOF SUPPORT BEAM(garage facing Coachlite)

-----  
 Superimposed roof dead and live loads:

Tile dead load:       $DL_t := 11$       Live load:       $LL := 16$

Truss spacing:       $sp := 2$       Truss dead load:       $Rdl := \frac{2}{sp}$

Skip shtg. dead load:       $skshtg := 1$       Plywood felt & batts dead load:       $ply := 1.5$

Ceiling dead load:       $clg := 0$       misl. dead load:       $msl := 0$

Total dead load:       $DL := DL_t + Rdl + skshtg + ply + clg + msl$        $DL = 14.5$

Superimposed floor dead and live loads

Length:       $l := 18.5 \cdot 12$       Trib area:       $ta := \frac{18.5^2}{4}$

Point load:       $pl := (DL + LL) \cdot ta$

Point load live load only:  $pld := LL \cdot ta$



Application of point load

$$a := \frac{l}{2} \quad b := l - a$$

$$F_y := 2600 \cdot 1.25 \quad E := 1900000 \quad F_v := 295 \cdot 1.25$$

$$\text{End reactions:} \quad R_1 := pl \cdot \frac{b}{l} \quad R_1 = 1304.828 \quad R_2 := pl \cdot \frac{a}{l} \quad R_2 = 1304.828$$

$$\text{A min. required} = R_1 \cdot \frac{3}{2} \cdot \frac{1}{F_v} = 5.308 \quad R_2 \cdot \frac{3}{2} \cdot \frac{1}{F_v} = 5.308$$

$$\text{S min. required} = pl \cdot a \cdot \frac{b}{l \cdot F_y} = 44.565$$

$$\text{I min. required} = pl \cdot a \cdot b \cdot (a + 2 \cdot b) \cdot \frac{(3 \cdot a \cdot (a + 2 \cdot b))^5}{27 \cdot E \cdot \frac{l}{240}} = 338.459$$

Beam section properties:  $w := 1.75$   $d := 14$

$$A := w \cdot d \quad S := w \cdot \frac{d^2}{6} \quad I := w \cdot \frac{d^3}{12}$$

-----  
- A = 24.5 > 5.3    S = 57.167 > 45    I = 400.167 > 338    therefore O.K.  
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MICROLAM GARAGE ROOF CARRY BEAM (garage facing Northlite)

Superimposed roof dead and live loads:

$$\text{Tile dead load:} \quad DL_t := 11 \quad \text{Live load:} \quad LL := 16$$

$$\text{Truss spacing:} \quad sp := 2 \quad \text{Truss dead load:} \quad R_d l := \frac{2}{sp}$$

$$\text{Skip shtg. dead load:} \quad skshtg := 1 \quad \text{Plywood felt \& batts dead load:} \quad ply := 1.5$$

$$\text{Ceiling dead load:} \quad clg := 0 \quad \text{misc. dead load:} \quad msl := 0$$

$$\text{Total dead load:} \quad DL := DL_t + R_d l + skshtg + ply + clg + msl \quad DL = 14.5$$

Superimposed floor dead and live loads

$$\text{Length:} \quad l := 22 \cdot 12 \quad \text{Trib area:} \quad ta := \frac{(22 \cdot 26)}{4}$$

$$\text{Point load:} \quad pl := (DL + LL) \cdot ta \quad \text{Point load live load only:} \quad pld := LL \cdot ta$$

Application of point load

$$a := 7.5 \cdot 12 \quad b := l - a$$

$$F_y := 2600 \cdot 1.25 \quad E := 1900000 \quad F_v := 295 \cdot 1.25$$

$$\text{End reactions:} \quad R_1 := pl \cdot \frac{b}{l} \quad R_1 = 2874.625 \quad R_2 := pl \cdot \frac{a}{l} \quad R_2 = 1486.875$$

$$\text{A min. required} = R_1 \cdot \frac{3}{2} \cdot \frac{1}{F_v} = 11.693 \quad R_2 \cdot \frac{3}{2} \cdot \frac{1}{F_v} = 6.048$$



S min. required =  $pl \cdot a \cdot \frac{b}{l \cdot F_y} = 79.605$

I min. required =  $pl \cdot a \cdot b \cdot (a + 2 \cdot b) \cdot \frac{(3 \cdot a \cdot (a + 2 \cdot b))^5}{27 \cdot E \cdot \frac{l}{240}} = 690.568$

Beam section properties:  $w := 3.5$   $d := 14$

$A := w \cdot d$   $S := w \cdot \frac{d^2}{6}$   $I := w \cdot \frac{d^3}{12}$

-----  
 - A = 49 > 12      S = 114.333 > 80      I = 800.333 > 691      therefore O.K.  
 -----

MICROLAM ROOF SUPPORT BEAM(garage facing Northlite):

$rdl := 15$        $rll := 14$        $rta := \frac{22}{2}$        $l := 20$        $rta \cdot l = 220$

$Wdl := 14 \cdot \frac{3.5}{144} \cdot 35$        $Wdl = 11.91$        $E := 1900000$        $Fb := 2600 \cdot 1.25$

$wt := rta \cdot (rdl + rll) + Wdl$

S min. required =  $(wt) \cdot l^2 \cdot \frac{1.5}{Fb} = 61.091$

I min. required =  $5 \cdot (wt) \cdot \frac{(l \cdot 12)^4}{12 \cdot 384 \cdot E \cdot l \cdot \frac{12}{240}} = 626.987$

Use 2(two)-1-3/4"x11-7/8" MicroLam beam:

$w := 3.5$        $d := 14$        $Cf := \left( \frac{12}{d} \right)^{\frac{1}{9}}$   
 $S := Cf \cdot w \cdot \frac{d^2}{6}$        $I := w \cdot \frac{d^3}{12}$

-----  
 S = 112.392 > 61      I = 800.333 > 627      Therefore 2-1-3/4"x11.875" MLB is O.K.  
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