

CITY OF LEE'S SUMMIT  
CODES ADMINISTRATION

MAR 8 2013

March 4, 2013

Summit Custom Homes  
40 SE 30th Street  
Lee's Summit, MO 64082

RECEIVED

Re: 1321 NE Country Lane  
Lot 6, Fritchie Bluff

Apex Engineers, Inc. observed the framing for the house located at the address above. Our firm was retained to address a structural issue noted during the rough-in inspection.

Several floor joists were bored with a larger diameter hole than allowed by code. The holes are 3-1/2" in diameter and are a minimum of 2" from the bottom of the joist. One of the joists was severed and headered off to the adjacent joists. After computations, our firm recommends the following:

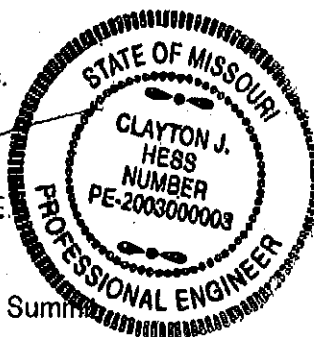
- The floor joists on either side of the severed joist need to be doubled.
- Centered under each 3-1/2" diameter hole, fasten, to the bottom of the joist, a 1-1/4" wide, 36" long by 20 gauge steel strap (Simpson CS20) with a minimum of (8) 10d common nails on each side of the hole. See attached sketch for clarity.

Contingent upon the aforementioned repairs, our firm recommends approval of this framing item. Please call if our firm can be of further assistance.

#### LIMITATIONS

The scope of our services includes only those items specifically addressed herein. All other items are outside the scope of this inspection; including but not limited to, any environmental assessment (such as, but not limited to mold, mildew, presence of hazardous or toxic materials in the soil, surface water, ground water, etc.).

In addition, the scope our services does not include any evaluation of the building or site for job-site safety and/or hazardous conditions. All construction shall be performed in compliance with IRC and OSHA standards at all times. Our firm has not been retained to examine the site or building for any of these conditions. In addition, the contractor shall retain sole responsibility for the quality of work, for adhering to plans, specifications, appropriate codes, and, for repairing defects, deficiencies or omission, regardless of when they are found.

Best Regards,  
Apex Engineers, Inc.Clayton J. Hess, P.E.  
Principal

cc: City of Lee's Summit



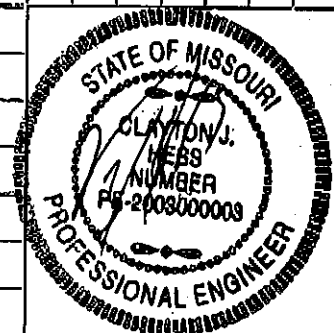
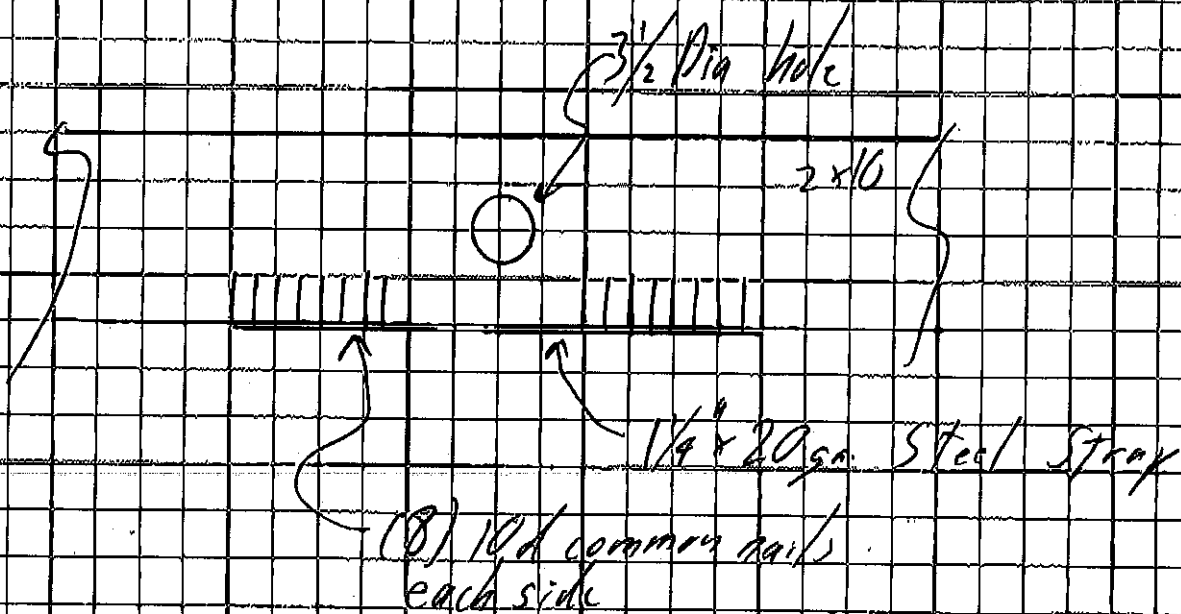
Apex Engineers, Inc.  
9000 W 64th Terrace  
Merriam, KS 66202

www.apex-engineers.com

Job Address: 1321 NE County Lane Sheet # 1 of 3  
Summit

Engineer: CJH

Date: \_\_\_\_\_





Apex Engineers, Inc.  
9000 W 64th Terrace  
Merriam, KS 66202

www.apex-engineers.com

Job Address:

1321 N Country Lane  
Summit

Sheet #

2 of 3

Engineer: CJH

Date:

3/8/13

Design Load (Service)

$e_{36}$

$V = 276$

$M = 1.173 \text{ k-ft}$

$3.75"$

$3.5"$

$2"$

$36"$

$14'-6"$

Capacity @ hole

$V_u F_v = 180 \text{ psi}$

$$V_{cap} = \frac{2}{3} (925 - 3.5) (1.5") = 180 \text{ psi}$$

$$SF = \frac{180}{276} = 0.65 \text{ OK}$$

$d = 7.25$  Use  $f_y = 2'$  and  $f_{cr} = 2'$

$F_t = 575 \text{ psi}$

$$M_{cap} = 2' \times 1.5" \times 575 \text{ psi} \times 7.25$$

$= 12506 \text{ in-lb}$

$\frac{16 \text{ ft}}{1000}$

$\frac{1 \text{ ft}}{12 \text{ in}}$

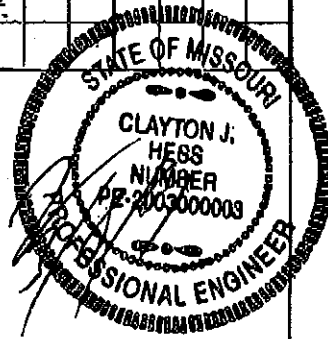
$= 1.04 \text{ k-ft}$

$\therefore$  Add Strap

$$M_{strap} = 0.0389 \times 1.25 \times 8.25 \times 26,400 \text{ psi}$$

$= 6786 \text{ in-lb} = 0.565 \text{ k-ft}$

$\therefore$  OK



## Multiple Simple Beam

Lic. #: KW-06005244

File = G:\Users\clhess\Documents\ENERCALC\1\clayton2.ec6  
 ENERCALC, INC. 1993-2013, Build: 8.13.2.27, Ver: 6.13.2.27  
 Licensee: APEX ENGINEERS INC

Description: 1321 NE Country Lane - Summit

Wood Beam Design: --None--

Calculations per 2005 NDS

BEAM Size: 2x10, Sawn, Fully Braced

Using Allowable Stress Design with ASCE 7-05 Load Combinations, Major Axis Bending

Wood Species: Douglas Fir - Larch

Wood Grade: No.2

|              |           |           |             |    |           |             |             |         |            |
|--------------|-----------|-----------|-------------|----|-----------|-------------|-------------|---------|------------|
| Fb - Tension | 900.0 psi | Fc - Prll | 1,350.0 psi | Fv | 180.0 psi | Ebend-xx    | 1,600.0 ksi | Density | 32.210 pcf |
| Fb - Compr   | 900.0 psi | Fc - Perp | 625.0 psi   | Ft | 575.0 psi | Eminbend-xx | 580.0 ksi   |         |            |

### Applied Loads

Unif Load: D = 0.010, L = 0.040 k/ft, Trib = 1.330 ft

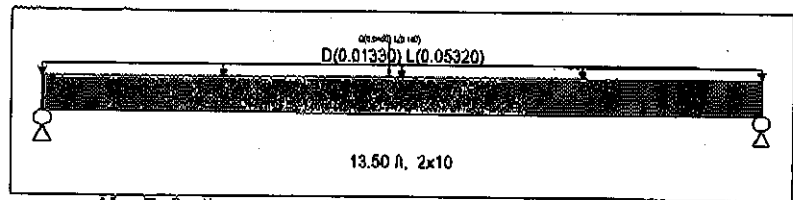
Point: D = 0.0450, L = 0.180 k @ 6.50 ft

### Design Summary

Max fb/Fb Ratio = 1.118 : 1  
 fb : Actual : 1,272.84 psi at 6.525 ft in Span # 1  
 Fb : Allowable : 1,138.50 psi  
 Load Comb : +D+L+H

Max fv/Fv Ratio = 0.309 : 1  
 fv : Actual : 55.84 psi at 0.000 ft in Span # 1  
 Fv : Allowable : 180.00 psi  
 Load Comb : +D+L+H

|                   |      |      |    |   |   |   |   |
|-------------------|------|------|----|---|---|---|---|
| Max Reactions (k) | D    | L    | Lr | S | W | E | H |
| Left Support      | 0.11 | 0.45 |    |   |   |   |   |
| Right Support     | 0.11 | 0.45 |    |   |   |   |   |



### Max Deflections

|                      |           |                  |           |
|----------------------|-----------|------------------|-----------|
| Downward L+Lr+S      | 0.354 in  | Downward Total   | 0.442 in  |
| Upward L+Lr+S        | 0.000 in  | Upward Total     | 0.000 in  |
| Live Load Defl Ratio | 456 > 360 | Total Defl Ratio | 366 > 180 |

Wood Beam Design: --None--

Calculations per 2005 NDS

BEAM Size: 2x10, Sawn, Fully Braced

Using Allowable Stress Design with ASCE 7-05 Load Combinations, Major Axis Bending

Wood Species: Douglas Fir - Larch

Wood Grade: No.2

|              |           |           |             |    |           |             |             |         |            |
|--------------|-----------|-----------|-------------|----|-----------|-------------|-------------|---------|------------|
| Fb - Tension | 900.0 psi | Fc - Prll | 1,350.0 psi | Fv | 180.0 psi | Ebend-xx    | 1,600.0 ksi | Density | 32.210 pcf |
| Fb - Compr   | 900.0 psi | Fc - Perp | 625.0 psi   | Ft | 575.0 psi | Eminbend-xx | 580.0 ksi   |         |            |

### Applied Loads

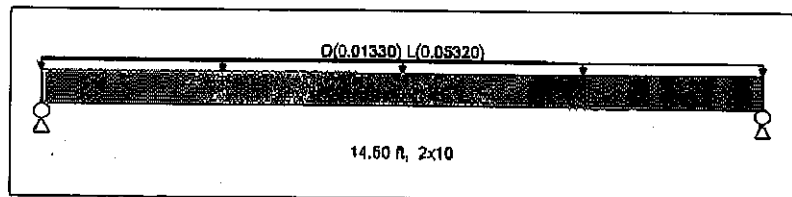
Unif Load: D = 0.010, L = 0.040 k/ft, Trib = 1.330 ft

### Design Summary

Max fb/Fb Ratio = 0.861 : 1  
 fb : Actual : 980.45 psi at 7.250 ft in Span # 1  
 Fb : Allowable : 1,138.50 psi  
 Load Comb : +D+L+H

Max fv/Fv Ratio = 0.261 : 1  
 fv : Actual : 46.91 psi at 13.775 ft in Span # 1  
 Fv : Allowable : 180.00 psi  
 Load Comb : +D+L+H

|                   |      |      |    |   |   |   |   |
|-------------------|------|------|----|---|---|---|---|
| Max Reactions (k) | D    | L    | Lr | S | W | E | H |
| Left Support      | 0.10 | 0.39 |    |   |   |   |   |
| Right Support     | 0.10 | 0.39 |    |   |   |   |   |



### Max Deflections

|                      |           |                  |           |
|----------------------|-----------|------------------|-----------|
| Downward L+Lr+S      | 0.336 in  | Downward Total   | 0.420 in  |
| Upward L+Lr+S        | 0.000 in  | Upward Total     | 0.000 in  |
| Live Load Defl Ratio | 517 > 360 | Total Defl Ratio | 414 > 240 |

