240 CANTERBURY

#1954

1

ROOF LOADS:

SHINGLES	= 2 PSF
DECKING & BLKG.	= 3
T.C. TRUSS & DIAGS:	= 3
CLGS	= 2
HVAC/ELECT	= 2
B.C. TRUSS & DIAG.	= 3

ΣDL = 15 PSF
ΣLL = 20 PSF
ΣTL = 35 PSF

2ND FLR LOADS:

CARP. & PAD	= 4
DECKING & BLKG.	= 3
T.C. TRUSS & DIAGS	= 3
CLGS	= 2
B.C. TRUSS & DIAGS	= 3

ΣDL = 15 PSF
ΣLL = 40 PSF
ΣTL = 55 PSF

RJ1: SPAN = 11.0'	LDS = 35	V = 200
RJ2: SPAN = 5.3'	✓	V = 100
RJ3: SPAN = 10.5'	✓	V = 190
RJ4: SPAN = 14.3'	✓	V = 250
RJ5: SPAN = 5.5'	✓	V = 100
RJ6: SPAN = 7.0'	✓	V = 130

2J1: SPAN = 17.5'	LDS = 55	V = 490
2J2: SPAN = 13.9'	✓	V = 390

W1: 200 (RJ1) + 100 (RJ2) = 300 #/'

W2: 100 (RJ2) + 190 (RJ3) = 290 #/'

W3: 250 (RJ4) + 100 (RJ5) = 350 #/'

W4: 100 (RJ5) + 130 (RJ6) = 230 #/'

W5: 130 (RJ6) #/'

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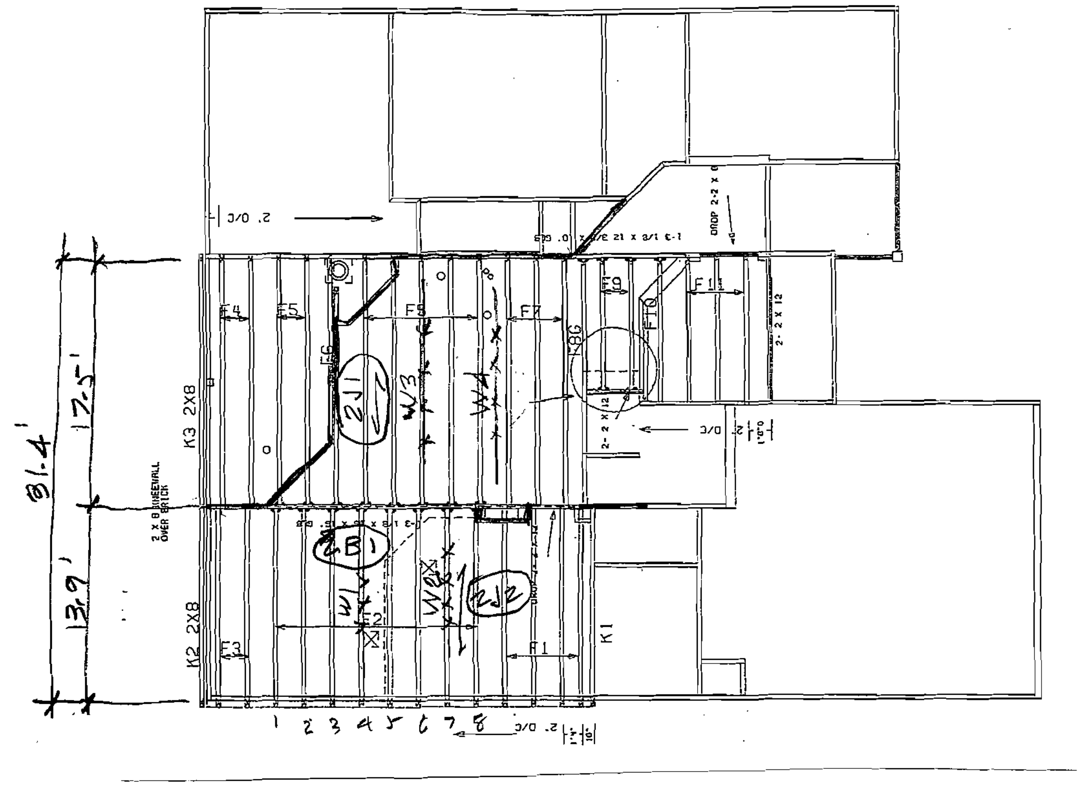
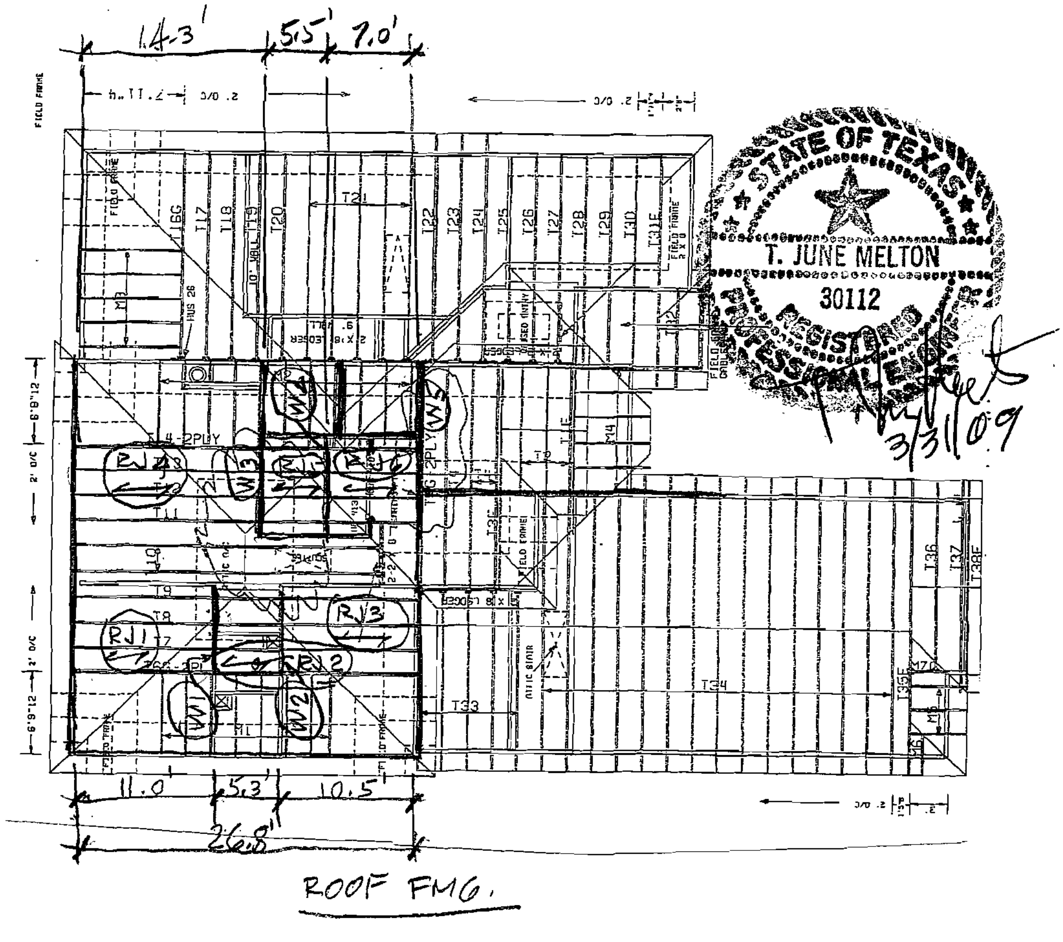
30112
REGISTERED PROFESSIONAL ENGINEER

3/31/09



2ND FLR FMG.

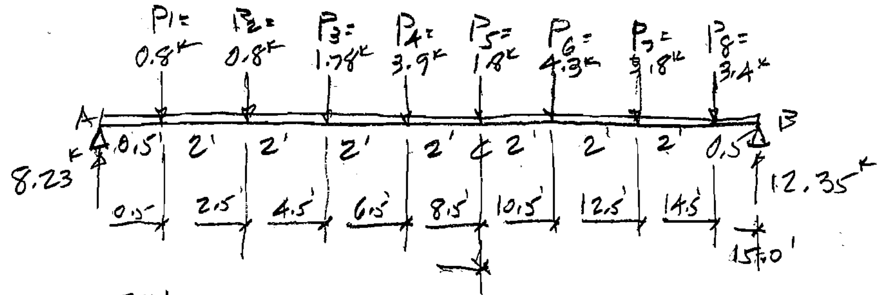


ROOF FMG.

BEAM 2B1 - SOLID GLUE LAM 3" x 15 3/4"

20.58^K

ASSUME F_b = 2400 psi



P_1 = 0 (2J1) + (390)(2) (2J2) + 20 (BM) = 800#

P_2 = 800

P_3 = (490)(2) (2J1) + (390)(2) (2J2) + 20 (BM) = 1780#

P_4 = (490)(2) (2J1) + (390)(2) (2J2) + (300#/')(7') (W1) + 20 (BM) = 3880#

P_5 = (490)(2) (2J1) + (390)(2) (2J2) + 20 (BM) = 1780#

P_6 = (490)(2) (2J1) + (350#/')(9')(0.8) (W3, %) + (390)(2) (2J2) + 20 (BM) = 4300#

P_7 = (490)(2) (2J1) + (290)(7) (W2) + (390)(2) (2J2) + 20 (BM) = 3810#

P_8 = (490)(2) (2J1) + (230)(9')(0.8) (W4, %) + (390)(2) (2J2) + 20 (BM) = 3440#

CONNECTOR REACTIONS

2J1	2J2
0	780#
0	780#
980#	780#
980#	2880# N.G. F2
980#	780#
3500# N.G. F5	780#
980#	2810# N.G. F2
2640 F5 N.G.	780#

USED SIMPSON THA413
R_{ALLOW} = 1940# FLOOR

$$\Sigma M_C = (4.3)(2) + (3.8)(4) + (3.4)(6) - (12.35)(6.5)$$
$$= 8.6 + 15.2 + 20.4 - 80.3$$

M_C = 36.1'K (433"K)

$$S_{x\,req} = \frac{433}{2.4\,ksi} = 180.5\,in^3$$

$$S_{x\,FURN} = \left(\tfrac{1}{6}\right)(3)(15.75)^2 = 124\,in^3$$ NG.

EXISTING BEAM IS TOO SMALL

T. JUNE MELTON 30112
STATE OF TEXAS PROFESSIONAL ENGINEER

3/31/09

Subj: **Calculations**
Date: 4/8/2009 4:33:04 A.M. Central Daylight Time
From: Engr101
To: evin@housedefects.com
CC: carolh@austin.rr.com

Evin-
Letter is attached. I'm leaving the office for the airport in a few minutes.
T. June Melton, PE
Amstar Engineering, Inc.
707 River Road
Austin, TX 78734
512-263-3661 x 1
512-263-7916 (Fax)
512-699-3665 (cell)

AMSTAR ENGINEERING, INC.
Structural/Civil Consultants
707 River Road
Austin, Texas 78734
(512) 263-3661 Fax (512) 263-7916

Registered Professional Engineers
Texas Oklahoma Arizona
Louisiana Georgia Colorado
Mississippi Utah North Carolina
Kentucky Alabama

April 7, 2009

Mr. Evin G. Dugas, Attorney at Law
2303 RR 620 S. STE 135 PMB 361
Austin, TX 78731

Ref: 240 Canterbury Arbitration – Calculations
Job #1954

Dear Mr. Dugas:

I have not been able to locate any calculations furnished and/or PE sealed by MLAW. Without the calculations, I cannot confirm that the roof girder truss repair designed by MLAW will work.

This afternoon, as you know, Mr. Cain asked me to testify as to whether or not I "rounded up" or "rounded down" my calculations. This indicates to me that the defense strategy might hinge around the accuracy of arithmetic to decimal precision rather than the accuracy of the procedures that engineers use while exercising their professional judgment and experience.

I have refined my calculations down to an accuracy of two decimal places to illustrate to Mr. Kilgore how rounding up or rounding down makes little difference to structural engineers in determining the outcome of the analysis of a building component, which in this illustration is a laminated wood floor beam. Also, I can usually be more accurate in my analyses when I have been furnished a proper set of plans that I can legibly read which did not occur in this particular case.

Attached are two computer-generated calculation spreadsheets. Canterbury240A.xls utilizes the center to center bearing point span of 15.0 feet as indicated in my original calculations. Canterbury240B.xls utilizes the span of 14.4375 feet indicated on Bates CPH000187. (Please be aware that the calculations indicated on Bates CPH000187 are incorrect insofar as no consideration has been shown for the second floor load bearing walls). Regardless of calculation method utilized, the beam furnished is overstressed and therefore too small and it must be replaced.

There is one other point I should point out. Neither of the span lengths I have indicated in the calculations can be used in the design of a replacement beam. As a result of the misalignment of the beam with the grade beam in the concrete foundation during the original construction, the length of the replacement beam will need to be increased in order to reach the exterior wall top plates as I testified to earlier. That will require a larger replacement beam.

I sent a final invoice to our clients earlier this evening so please advise them that there is no charge for this extra little service. I am leaving on the early flight to Fayetteville in the morning but I should be available by cell phone around noon if you have any questions. My cell phone number is 512-699-3665.

Yours truly,
AMSTAR ENGINEERING, INC.
TxPE Firm 1975

T. June Melton, P.E.

by T. June Melton, PE

encl.

STATE OF TEXAS
T. JUNE MELTON
30112
REGISTERED
PROFESSIONAL ENGINEER
4/7/09

Canterbury240A.xls
Readable (normal size) plans have not been provided. Assume rough cross span lengths.
Assume 15 foot span to center of bearing

Span = 15.00 ft
Roof load TL = 35.00 psf
2nd floor TL = 55.00 psf
Beam wt = 13.60 plf

RJ1	Span =	11.00	Lds =	35.00	V=	192.50			
RJ2	Span =	5.30	Lds =	35.00	V=	92.75			
RJ3	Span =	10.50	Lds =	35.00	V=	183.75			
RJ4	Span =	14.30	Lds =	35.00	V=	250.25			
RJ5	Span =	5.50	Lds =	35.00	V=	96.25			
RJ6	Span =	7.00	Lds =	35.00	V=	122.50			
2J1	Span =	17.50	Lds =	55.00	V=	481.25			
2J2	Span =	13.90	Lds =	55.00	V=	382.25			
W1	192.50	+	92.75		sum =	285.25			
W2	92.75	+	183.75		sum =	276.50			
W3	250.25	+	96.25		sum =	346.50			
W4	96.25	+	122.50		sum =	218.75			
W5	122.50	+	0.00		sum =	122.50			
P1	0.00	+	764.50	+	13.60			sum =	778.10
P2	778.10							sum =	778.10
P3	962.50	+	764.50	+	13.60			sum =	1740.60
P4	962.50	+	764.50	+	1996.75	+	13.60	sum =	3737.35
P5	962.50	+	764.50	+	13.60			sum =	1740.60
P6	962.50	+	764.50	+	2494.80	+	13.60	sum =	4235.40
P7	962.50	+	764.50	+	1935.50	+	13.60	sum =	3676.10
P8	962.50	+	764.50	+	1575.00	+	13.60	sum =	3315.60
VA=	7484.92	#							
VB=	12516.94	#							
Mc=	38291.28	ft-#							
SxR=	191.46	in3							

For beam measured SxFurn= 124.03 in3
OVERSTRESS = 1.54

For beam (theoretical) SxFurn= 133.33 in3 Ref Bates CPH000187
OVERSTRESS = 1.44

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4/7/09

Canterbury240B.xls
Readable (normal size) plans have not been provided. Assume rough cross span lengths.
Assume 14.4375 foot span to center of bearing per Bates CPH000187

Span = 14.44 ft
Roof load TL = 35.00 psf
2nd floor TL = 55.00 psf
Beam wt = 13.60 plf

RJ1	Span =	11.00	Lds =	35.00	V=	192.50			
RJ2	Span =	5.30	Lds =	35.00	V=	92.75			
RJ3	Span =	10.50	Lds =	35.00	V=	183.75			
RJ4	Span =	14.30	Lds =	35.00	V=	250.25			
RJ5	Span =	5.50	Lds =	35.00	V=	96.25			
RJ6	Span =	7.00	Lds =	35.00	V=	122.50			
2J1	Span =	17.50	Lds =	55.00	V=	481.25			
2J2	Span =	13.90	Lds =	55.00	V=	382.25			
W1	192.50	+	92.75		sum =	285.25			
W2	92.75	+	183.75		sum =	276.50			
W3	250.25	+	96.25		sum =	346.50			
W4	96.25	+	122.50		sum =	218.75			
W5	122.50	+	0.00		sum =	122.50			
P1	0.00	+	764.50	+	13.60			sum =	778.10
P2	778.10							sum =	778.10
P3	962.50	+	764.50	+	13.60			sum =	1740.60
P4	962.50	+	764.50	+	1996.75	+	13.60	sum =	3737.35
P5	962.50	+	764.50	+	13.60			sum =	1740.60
P6	962.50	+	764.50	+	2494.80	+	13.60	sum =	4235.40
P7	962.50	+	764.50	+	1935.50	+	13.60	sum =	3676.10
P8	962.50	+	764.50	+	1575.00	+	13.60	sum =	3315.60
VA=	7412.87	#							
VB=	12588.98	#							
Mc=	35454.99	ft-#							
SxR=	177.27	in3							

For beam measured SxFurn= 124.03 in3
OVERSTRESS = 1.43

For beam (theoretical) SxFurn= 133.33 in3 Ref Bates CPH000187
OVERSTRESS = 1.33

STATE OF TEXAS
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4/7/09

Member Data

Description:

Standard Load:
Dead Load: 15 PLF
Live Load: 40 PLF

Member Type: Beam
Lateral Bracing: Continuous Both
Moisture Condition: Dry
Deflection Criteria: L/360 live, L/240 total
Deck Connection: Nailed
Filename: KYB1

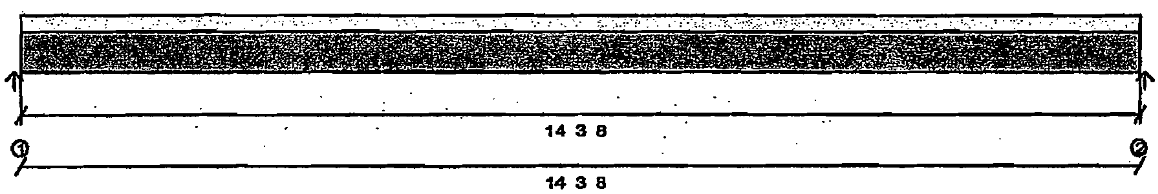
Application: Floor

Building Code: IBC / IRC

Member Weight: 13.6 PLF

Other Loads

Type (Description)	Begin	End	Trib. Width	Dead Start	End	Other Start	End	Category
Replacement Uniform (PLF)	0' 0.00"	14' 3.50"		231		616		Live



Bearings and Reactions

	Location	Type	Input Length	Min Required	Gravity Reaction	Gravity Uplift
1	0' 0.000"	Wall	N/A	2.682"	6212#	--
2	14' 5.250"	Wall	N/A	2.682"	6212#	--

Maximum Load Case Reactions

Used for applying point loads (or line loads) to carrying members

	Dead	Live
1	1766#	4447#
2	1766#	4447#

Design spans
14' 5.250"

Product: 24F-V3 Stk G-lam 3 1/8 x 16 1 ply
Component Member Design has Passed Design Checks.**
Minimum 2.68" bearing required at bearing # 1
Minimum 2.68" bearing required at bearing # 2
Design assumes continuous lateral bracing for both chords.

Allowable Stress Design

	Actual	Allowable	Capacity	Location	Loading
Positive Moment	22423.'#	26709.'#	83%	7.22'	Total load D+L
Shear	5065.#	9014.#	56%	0.72'	Total load D+L
TL Deflection	0.4375"	0.7219"	L/396	7.22'	Total load D+L
LL Deflection	0.3131"	0.4813"	L/553	7.22'	Total load L

Control: Positive Moment
DOLs: Live=100% Snow=115% Roof=125% Wind=133%

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NORMAN SCHEEL
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This signature has been applied electronically

**Passing is defined as when the member, floor joist, beam or girder, shown on this drawing meets applicable design criteria for Loads, Loading Conditions, and Spans listed on this sheet. The design must be reviewed by a qualified designer or design professional as required for approval. This design assumes product installation according to the manufacturer's specifications.