MATRIX ENGINEERING, L.L.C.
Consulting Structural Engineers
P.O. Box 240974
Milwaukee, WI 53224
414-586-0660 ▪ FAX 414-586-0745
Info@MatrixEngineering.biz

Facsimile Transmission

To:	Mr. Scott Miller	**Date:**	6/13/03
Company:	Whitefish Bay Bldg. Inspection	**Pages:**	7
Fax:	(414) 351-8909	**From:**	Mike Loescher, P.E. MML
Phone:		**Email:**	Mike@MatrixEngineering.biz
Re:	Shovers Residence	**Project No.:**	2002104
		cc:	Kevin Yurske (W-R)

Message:

1. Garage Attic Floor Framing:
   This condition is addressed by the calcs. on pages 2-3 of this fax. Both the 2x10 rafters @ 16" o.c. and the 11-7/8" TJI's @ 12" o.c. are OK for this loading condition.

2. House Attic Floor Framing (Media Room):
   The roof rafter bears on the end of the joist at a distance away from the stud wall less than the depth of the joist. Therefore the rafter reaction can be assumed to occur at the end of the joist directly above the stud wall. As a result, no additional loading occurs in the joist due to the rafter bearing condition. As the calcs. on pages 4-5 of this fax show, the joists are adequate for the attic knee wall loading due to the roof loads.

3. Header for Library Ridge Beam Post:
   The post supporting the library ridge beam bears on a (3) 2x12 header. As the calcs. on pages 6-7 show, this post load is assumed to be distributed to the cantilevered floor joists in the Master Wardrobe. The floor joists have been designed to accommodate this concentrated load at the ends of the joists in addition to the normal floor loading.

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Milwaukee, WI 53224
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LETTER OF TRANSMITTAL

DATE: 06-09-03

TO: Fox Point Village Hall
Attn: Mr. Scott Miller - Building Inspector
7200 N Santa Monica Blvd
Whitefish Bay, WI 53217

FROM: Michael M. Loescher, P.E.

JOB NO.: 2002104

RE: Shovers Residence
Engineering Package

CC: Kevin Yurske (Weissmann-Ruvin)
[Transmittal Only via FAX]

VIA: FIRST CLASS MAIL

WE ARE SENDING HEREWITH THE FOLLOWING ITEMS:

ITEM	COPIES	DESCRIPTION	COMMENTS
1	1	CALCULATIONS	

THESE ARE TRANSMITTED AS REQUESTED.

EXPLANATION: N/A

REMARKS:

Structural Calculations

prepared for:

Weissmann Ruvin Design Partnership, Inc.

project:

Shovers-Feldman Residence

location:

1070 East Thorn Drive
Fox Point, WI

prepared by:

Matrix Engineering, L.L.C.
P.O. Box 240974
Milwaukee, WI 53224-3025
(414)-586-0660 FAX (414)-270-4145
www.MatrixEngineering.biz

M.E. Job #2002104

June 9, 2003

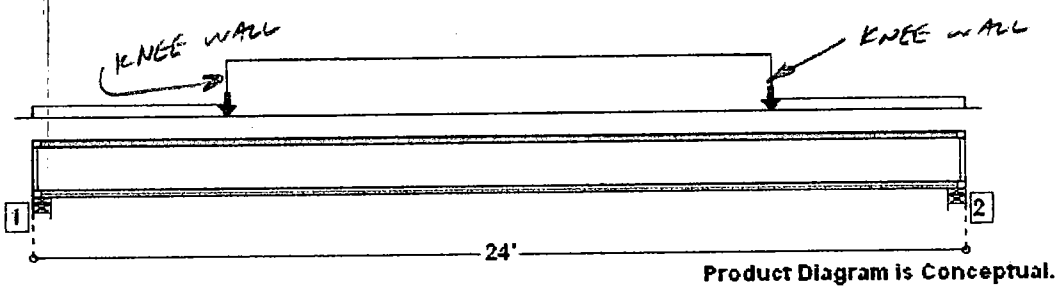
Trus Joist
A Weyerhaeuser Business

TJ-Beam(TM) 6.02 Serial Number: 7002016782
User: 2 8/3/02 7:05:08 PM
Page 1 Engine Version: 1.2.1

GARAGE ATTIC JOIST

11 7/8" TJI®/Pro(TM)-550 @ 12" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Residential - Living Areas (psf): 0.0 Live at 100 % duration, 10.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(psf)	Floor(1.00)	40.0	0.0	5' To 19'	Adds To	
Point(lbs)	Snow(1.15)	200	100	5'	-	
Point(lbs)	Snow(1.15)	200	100	19'	-	

30PSF(9.5')(1'-0") = 285#

Wind Load Group - 20.0 Live, 10.0 Dead

SUPPORTS:

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Stud wall	5.50"	5.50"	480 / 220 / -53 / 700	End, TJI Blocking	1 Ply TJI®/Pro(TM)-550
2	Stud wall	5.50"	5.50"	480 / 220 / -53 / 700	End, TJI Blocking	1 Ply TJI®/Pro(TM)-550

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	696	-695	2214	Passed (31%)	Rt. end Span 1 under Snow (Primary Load Group) loading
Vertical Reaction (lbs)	696	696	2168	Passed (32%)	Bearing 2 under Snow (Primary Load Group) loading
Moment (Ft-Lbs)	4338	4338	9179	Passed (47%)	MID Span 1 under Snow (Primary Load Group) loading
Live Load Defl (in)		0.529	0.581	Passed (L/527)	MID Span 1 under Snow (Primary Load Group) loading
Total Load Defl (in)		0.724	1.163	Passed (L/386)	MID Span 1 under Snow (Primary Load Group) loading
TJPro		34	30	Passed	Span 1

-Deflection Criteria: STANDARD(LL:L/480,TL:L/240).
-TJ maximum bearing length controls reaction capacity. Limits: End supports, 3 1/2". Intermediate supports, 5 1/4".
-Allowable moment was increased for repetitive member usage.
-Deflection analysis is based on composite action with single layer of 19/32", 5/8" Panels (20" Span Rating) GLUED & NAILED wood decking.
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability. [2' 8" o/c due to Primary Application Loads; 2' 8" o/c due to Wind Application Loads]

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code BOCA analyzing the TJ Custom product listed above.
-Live load on portion of joist area is very low.

PROJECT INFORMATION:

SHOVERS RESIDENCE

OPERATOR INFORMATION:

Michael Loescher, P.E.
Matrix Engineering, L.L.C.

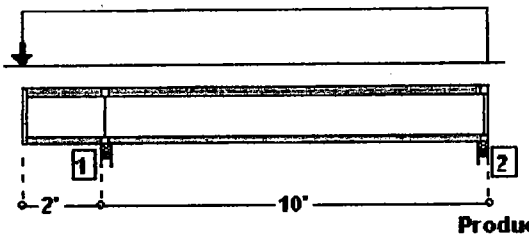
TJ-Beam(TM) 6.02 Serial Number: 7002016782
User: 2 1/13/03 1:25:07 PM
Page 1 Engine Version: 1.2.1

UPPER FLOOR JOIST @ MASTER WARDROBE

14" TJI®/Pro(TM)-250 @ 16" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

Overall Dimension: 12'



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Residential - Living Areas (psf): 40.0 Live at 100 % duration, 10.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Point(lbs)	Snow(1.15)	467	233	0	-	
Point(lbs)	Floor(1.00)	320	80	0	-	

SUPPORTS:

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Stud wall	3.50"	3.50"	1346 / 479 / 0 / 1825	Overhang	1 Ply TJI®/Pro(TM)-250
2	Stud wall	3.50"	3.50"	268 / -6 / -194 / 263	End, TJI Blocking	1 Ply TJI®/Pro(TM)-250

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	-1243	-1233	1967	Passed (63%)	Left OH under Snow loading
Vertical Reaction (lbs)	1825	1825	2335	Passed (78%)	Bearing 1 under Snow loading
Moment (Ft-Lbs)	-2514	-2514	6231	Passed (40%)	MID Span 1 under Snow ALTERNATE span loading
Live Load Defl (in)		0.045	0.107	Passed (2L/999+)	Left OH under Snow ALTERNATE span loading
Total Load Defl (in)		0.060	0.215	Passed (2L/859)	Left OH under Snow ALTERNATE span loading
TJPro		64	30	Passed	Span 1

-Deflection Criteria: Specified(LL:L/480,TL:L/240). Additional checks follow.
-Left Overhang:(LL:L/240, TL:L/120).
-Allowable moment was increased for repetitive member usage.
-Deflection analysis is based on composite action with single layer of 19/32", 5/8" Panels (20" Span Rating) GLUED & NAILED wood decking.
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.
-The load conditions considered in this design analysis include alternate member pattern loading.

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code BOCA analyzing the TJ Custom product listed above.

PROJECT INFORMATION:

OPERATOR INFORMATION:

Michael Loescher, P.E.
Matrix Engineering, L.L.C.

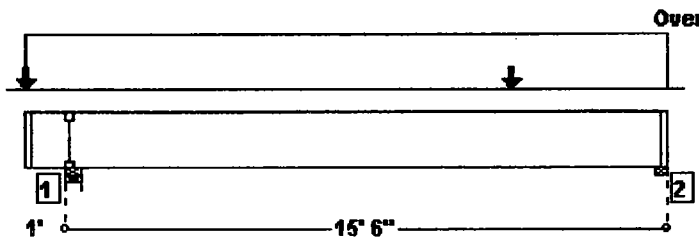
C:\My Documents\Matrix Engineering\Projects\2002104-Showers-Feldman\2002104-Wardrobe Joists.sms

TJ-Beam(TM) 6.05 Serial Number: 7002114232
User: 2 2/3/03 11:06:36 AM
Page 1 Engine Version: 1.5.12

CANT. HEADER AT STAIR OVERHANG

2 Pcs of 1 3/4" x 14" 1.9E Microllam® LVL

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Header (Flush Beam) Member. Tributary Load Width: 1' 4"
Primary Load Group - Residential - Living Areas (psf): 40.0 Live at 100 % duration, 10.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Point(lbs)	Floor(1.00)	1920	3422	0	-	12' STAIR LVL
Point(lbs)	Floor(1.00)	0	816	0	-	RIM LVL
Point(lbs)	Floor(1.00)	0	675	12' 6"	-	BEARING WALL

> CONSERV. OMIT SNOW REDUCTION

SUPPORTS:

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Stud wall	5.50"	5.50"	2547 / 4991 / 0 / 7539	Overhang	1 Ply 1 3/4" 1.9E Microllam® LVL
2	Plate on steel beam	3.50"	3.50"	412 / 365 / 0 / 777	End, Rim	1 Ply 1 1/4" 0.8E TJ-Strand Rim Board®

$f_{c_\perp} = \frac{7539}{2(1.75)(5.5)} = 392\# < 0.9(750) = 675\#$ OK

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	1282	1170	9310	Passed (13%)	Lt. end Span 1 under Floor loading
Moment (Ft-Lbs)	-7630	-7630	24258	Passed (31%)	MID Span 1 under Floor loading
Live Load Defl (in)		0.018	0.061	Passed (2L/999+)	Left OH under Floor ALTERNATE span loading
Total Load Defl (in)		0.044	0.123	Passed (2L/669)	Left OH under Floor ALTERNATE span loading

-Deflection Criteria: Specified(LL:L/480,TL:L/240). Additional checks follow.
-Left Overhang:(LL:L/240, TL:L/120).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.
-The load conditions considered in this design analysis include alternate member pattern loading.

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code BOCA analyzing the TJ Custom product listed above.
-Note: See TJ SPECIFIER'S / BUILDER'S GUIDES for multiple ply connection.

PROJECT INFORMATION:

OPERATOR INFORMATION:

Mike Loescher, P.E.
Matrix Engineering, L.L.C.

C:\My Documents\Matrix Engineering\Projects\2002104-Shovers-Feldman\2002104-Overhang Header @ Stair.sms

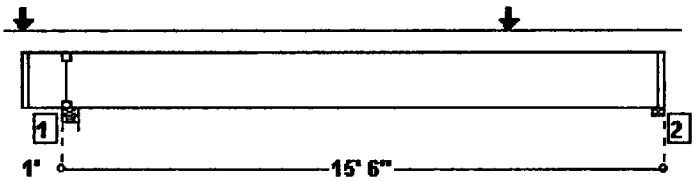
TJ-Beam(TM) 6.05 Serial Number: 7002114232
User: 2 2/3/03 10:51:56 AM
Page 1 Engine Version: 1.5.12

CANT. HEADER AT STAIR OVERHANG

2 Pcs of 1 3/4" x 14" 1.9E Microllam® LVL

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED

Overall Dimension: 16' 6"



Product Diagram is Conceptual.

LOADS:

Analysis is for a Header (Flush Beam) Member. Tributary Load Width: 1' 4"
Primary Load Group - Residential - Living Areas (psf): 0.0 Live at 100 % duration, 0.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Point(lbs)	Floor(1.00)	1920	3422	0	-	12' STAIR LVL
Point(lbs)	Floor(1.00)	0	816	0	-	RIM LVL
Point(lbs)	Floor(1.00)	0	675	12' 6"	-	BEARING WALL

SUPPORTS:

NO NET UPLIFT W/O FLOOR LOADS

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Stud wall	5.50"	5.50"	2076 / 4874 / 0 / 6950	Overhang	1 Ply 1 3/4" 1.9E Microllam® LVL
2	Plate on steel beam	3.50"	3.50"	-156 / 263 / 0 / 263	End, Rim	1 Ply 1 1/4" 0.8E TJ-Strand Rim Board®

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	775	756	9310	Passed (8%)	Lt. end Span 1 under Floor loading
Moment (Ft-Lbs)	-7579	-7579	24258	Passed (31%)	MID Span 1 under Floor ALTERNATE span loading
Live Load Defl (in)		0.018	0.061	Passed (2L/999+)	Left OH under Floor loading
Total Load Defl (in)		0.046	0.123	Passed (2L/636)	Left OH under Floor loading

-Deflection Criteria: Specified(LL:L/480,TL:L/240). Additional checks follow.
-Left Overhang:(LL:L/240, TL:L/120).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.
-The load conditions considered in this design analysis include alternate member pattern loading.

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code BOCA analyzing the TJ Custom product listed above.
-Note: See TJ SPECIFIER'S / BUILDER'S GUIDES for multiple ply connection.
-Dead load on portion of joist area is less than minimum allowed.
-Live load on portion of joist area is very low.

PROJECT INFORMATION:

OPERATOR INFORMATION:

Mike Loescher, P.E.
Matrix Engineering, L.L.C.

C:\My Documents\Matrix Engineering\Projects\2002104-Shovers-Feldman\2002104-Overhang Header @ Stair.sms

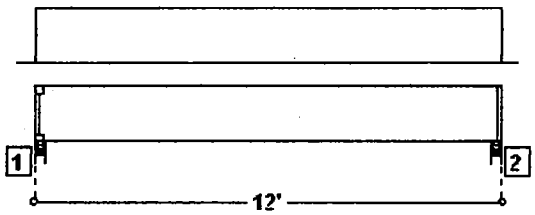
Trus Joist
A Weyerhaeuser Business

TJ-Beam(TM) 6.05 Serial Number: 7002114232
User: 2 1/30/2003 11:05:49 AM
Page 1 Engine Version: 1.5.12

LVL HEADER AT STAIR FRONT OVERHANG

3 Pcs of 1 3/4" x 14" 1.9E Microllam® LVL

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Header (Flush Beam) Member. Tributary Load Width: 1' 4"
Primary Load Group - Residential - Living Areas (psf): 0.0 Live at 100 % duration, 0.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(plf)	Snow(1.15)	320.0	240.0	0 To 12'	Adds To	ROOF
Uniform(plf)	Floor(1.00)	0.0	100.0	0 To 12'	Adds To	WALL
Uniform(plf)	Floor(1.00)	0.0	210.0	0 To 12'	Adds To	FACADE

SUPPORTS:

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Stud wall	3.50"	3.50"	1920 / 3422 / 0 / 5342	L1	1 Ply 1 3/4" 1.9E Microllam® LVL
2	Stud wall	3.50"	3.50"	1920 / 3422 / 0 / 5342	End, Rim	1 Ply 1 1/4" 0.8E TJ-Strand Rim Board®

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	5193	-4043	16060	Passed (25%)	Rt. end Span 1 under Snow loading
Moment (Ft-Lbs)	15147	15147	41846	Passed (36%)	MID Span 1 under Snow loading
Live Load Defl (in)		0.067	0.292	Passed (L/999+)	MID Span 1 under Snow loading
Total Load Defl (in)		0.188	0.583	Passed (L/746)	MID Span 1 under Snow loading

-Deflection Criteria: Specified(LL:L/480,TL:L/240).
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code BOCA analyzing the TJ Custom product listed above.
-Note: See TJ SPECIFIER'S / BUILDER'S GUIDES for multiple ply connection.

PROJECT INFORMATION:

OPERATOR INFORMATION:

Mike Loescher
Matrix Engineering, L.L.C.

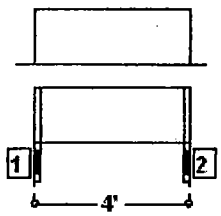
C:\Documents and Settings\Mike\My Documents\Matrix Engineering\Projects\2002104-Shovers-Feldman\2002104-Front Overhang LVL at Stair.sms

TJ-Beam(TM) 6.05 Serial Number: 7002114232
User: 2 1/30/2003 8:22:07 AM
Page 1 Engine Version: 1.5.12

OVERHANG LVL RIM BOARD

1 3/4" x 14" 1.9E Microllam® LVL @ 24" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Residential - Living Areas (psf): 0.0 Live at 100 % duration, 0.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Uniform(plf)	Floor(1.00)	0.0	322.0	0 To 4'	Adds To	
Uniform(plf)	Snow(1.15)	96.0	0.0	0 To 4'	Adds To	

SUPPORTS:

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Microllam LVL beam	1.75"	1.75"	192 / 644 / 0 / 836	A3: Rim Board	1 Ply 1 1/4" 0.8E TJ-Strand Rim Board®
2	Microllam LVL beam	1.75"	1.75"	192 / 644 / 0 / 836	A3: Rim Board	1 Ply 1 1/4" 0.8E TJ-Strand Rim Board®

-See TJ SPECIFIER'S / BUILDERS GUIDE for detail(s): A3: Rim Board

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	810	-287	5353	Passed (5%)	Rt. end Span 1 under Snow loading
Moment (Ft-Lbs)	785	785	13949	Passed (6%)	MID Span 1 under Snow loading
Live Load Defl (in)		0.001	0.097	Passed (L/999+)	MID Span 1 under Snow loading
Total Load Defl (in)		0.006	0.194	Passed (L/999+)	MID Span 1 under Snow loading
TJPro		71	30	Passed	Span 1

-Deflection Criteria: STANDARD(LL:L/480,TL:L/240).
-Deflection analysis is based on composite action with single layer of 23/32", 3/4" Panels (24" Span Rating) GLUED & NAILED wood decking.
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

ADDITIONAL NOTES:

-IMPORTANT! The analysis presented is output from software developed by Trus Joist (TJ). TJ warrants the sizing of its products by this software will be accomplished in accordance with TJ product design criteria and code accepted design values. The specific product application, input design loads, and stated dimensions have been provided by the software user. This output has not been reviewed by a TJ Associate.
-Not all products are readily available. Check with your supplier or TJ technical representative for product availability.
-THIS ANALYSIS FOR TRUS JOIST PRODUCTS ONLY! PRODUCT SUBSTITUTION VOIDS THIS ANALYSIS.
-Allowable Stress Design methodology was used for Building Code UBC analyzing the TJ Distribution product listed above.
-Dead load on portion of joist area is less than minimum allowed.
-Live load on portion of joist area is very low.

PROJECT INFORMATION:

SHOVERS RES.

OPERATOR INFORMATION:

Mike Loescher
Matrix Engineering, L.L.C.

RUVIN BROS.
ARTISANS & TRADES

7127 N. Green Bay Ave.
Milwaukee, WI 53209

TELEPHONE: 414-352-4220
FAX: 414-352-4134

FAX COVER SHEET

TO: Scott Miller FROM: Kurt Romsos

COMPANY: Village · Fox Point DATE: 30 DEC 02

FAX: 351·8909 TIME:

Pages sent 12 including cover sheet.

If you do not receive all pages, please contact us as soon as possible. Thank you.

NOTE:

David E. Groblewski, P.E., Inc.
Structural & Architectural Engineering
308 South 116 Street - West Allis - WI - 53214-3101
Telephone: 1/414/807-5185 * FAX: 1/414/258-5185

Fax

December 27, 2002

No. Pages: 11 **Including this page.**

ATTN
Kurt

To: LLOYD S. HAMM, INC.
Attn: Kevin

Fax: 1/262/679-1787

From: Dave Groblewski

Re: 1070 East Thorne Lane

RUVIN BROS.
ARTISANS & TRADES

7127 N. Green Bay Ave.
Glendale, WI 53209

TELEPHONE: 414-352-4220
FAX: 414-352-4134

FAX COVER SHEET

TO: Scott Miller FROM: Kurt

COMPANY: Village of Fox Point DATE: 02/06/03

FAX: (414) 351-8909 TIME: 3:20 PM

Pages sent 2 including cover sheet.

If you do not receive all pages, please contact us as soon as possible. Thank you.

NOTE:

Scott,

Per our conversation, here is the fax to verify the elevation for the Shovers residence (address listed below). It is 36 feet from the sub floor to the ridge. The current rough grade is approximately 2 feet below the sub floor. However, the final grade will be 1 foot below the sub floor. These measurements fall well within the 40 feet code.

Sincerely,
Kurt Romsos

Shovers
1070 E. Thorn Drive
Fox Point, WI 53217

WEISSMANN RUVIN

DESIGN PARTNERSHIP

Transmittal Cover Letter

To Whom:	**Scott Miller**
Date:	**August 14,2002**
The Company:	**Fox Point Building Department**
Telephone Number:	**(414) 351-8900**
Regarding:	**Shovers residence**
Sent From:	**Jeffrey R. Hancox** 122
Via:	**Hand Delivery**
Comments:	**Dear Scott:**

Attached are the Structural drawings for the Shovers residence on Thorn Lane. The major corners of the proposed house have been staked for your on-site review.

Please call me with any additional information you may require to help expedite the procuring of a building permit.

Thank you!

Signed:

Copy To:

7127 North Green Bay Avenue - Glendale, Wisconsin 53209
Tel 414 351 1200 - Fax 414 352 4134

Permit Number

MEC*check* Compliance Report
Wisconsin Uniform Dwelling Code

MEC*check* Software Version 3.3 Release 1b
Data filename: C:\Program Files\Check\MECcheck\Shovers.cck

HEAT LOSS CALCS

SHOVERS 1070 E. THORN LN.

TITLE: Shovers Residence

COUNTY: Milwaukee
HEATING TYPE: Non-Electric

DATE: 08/19/02
DATE OF PLANS: 7-1-02

COMPANY INFORMATION:
Total Comfort of Wisconsin

UDC COMPLIANCE: Passes

Code-Allowed UA = 688
Your Home = 688
0.0% Better Than Code

	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Glazing or Door U-Factor	UA
Ceiling 1: Flat Ceiling or Scissor Truss	1976	30.0	0.0		69
Wall 1: Wood Frame, 16" o.c.	3881	19.0	0.0		169
Window 3: Above Grade, Wood Frame, Double Pane with Low-E	0.290	721			
	256	209		0.250	64
Door 4: Glass	84			0.230	19
Door 1: Solid					
Basement Wall 1: Solid Concrete or Masonry, 8.0' ht/7.0' bg/8.0' insul	1345	0.0	5.0		122
Basement Wall 3: Solid Concrete or Masonry, 1.0' ht/0.0' bg/1.0' insul	234	0.0	5.0		36
Furnace 1: Forced Hot Air, 92 AFUE					

COMPLIANCE STATEMENT: The proposed building design described here is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building has been designed to meet the Wisconsin Uniform Dwelling Code requirements in MEC*check* Version 3.3 Release 1b and to comply with the mandatory requirements listed in the MEC*check* Inspection Checklist.

Builder/Designer_____ Date_____

Matrix Engineering, L.L.C.
Consulting Structural Engineers
P.O. Box 240974
Milwaukee, WI 53224-9025
(414) 586-0660 • FAX (414) 586-0745

Subject: SNOWDS - FROMAN RES.

Project No. 2002104

Date: 7/9/02 By: MM Sheet: ____ of ____

CODE: WISCONSIN ADMINISTRATIVE CODE (UNIFORM DWELLING CODE)

PROJECT LOCATION: 1070 EAST THORN DRIVE
FOX POINT, WI

ARCHITECT: WEISSMANN-RUVIN DESIGN PARTNERSHIP, INC.
7127 N GREEN BAY AVE
MILWAUKEE, WI 53209

LOADS:

SNOW:	30 PSF (ZONE 2)	
	~~40 PSF~~ 7/29/02	
ATTIC LIVE:	~~20 PSF~~	20 OK 7/30/02 PER S.H.
FLOOR LIVE: (INCL. PORCHES & DECKS)	40 PSF	40 PSF KURT 11/18/02
GARAGE FLOOR:	50 PSF	
WIND:	20 PSF (PROJECTED AREA)	

SOIL: NO SOIL REPORT WAS AVAILABLE.

ASSUMED ALLOWABLE BEARING PRESSURE = 2000PSF

ASSUMED EQUIVALENT FLUID PRESSURE = 45 PCF

******** NIC Port Device 960596 ASCII Test Print. ********

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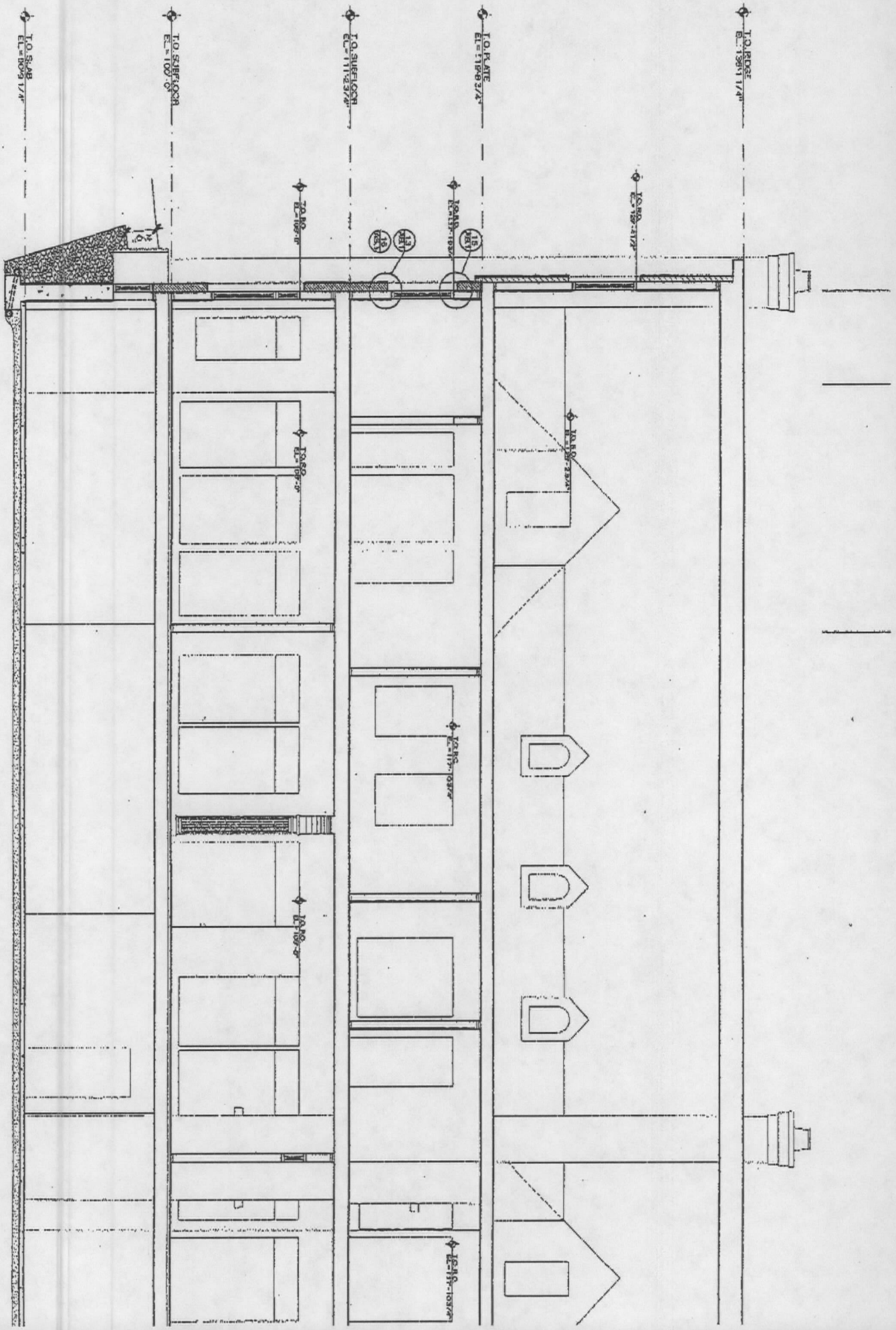
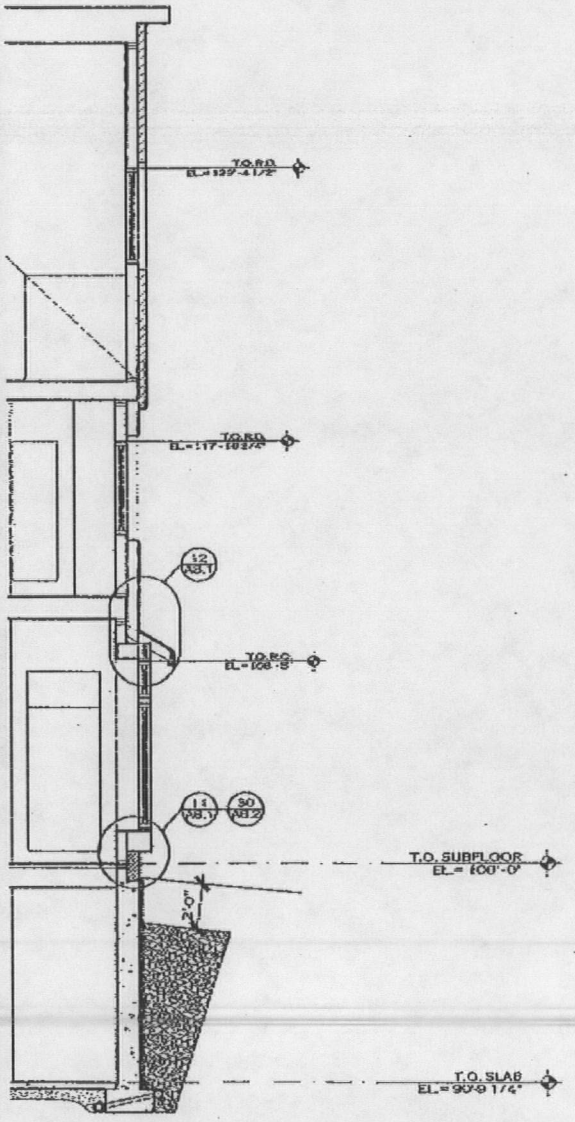
******** NIC Port Device 960596 ASCII Test Print. ********


T.O. SLAB
EL=100'-1 1/4"
T.O. SUBFLOOR
EL=100'-0"
T.O. SUBFLOOR
EL=111'-3 3/4"
T.O. PLATE
EL=111'-10 3/4"
T.O. ROOF
EL=136'-11 1/4"
T.O.R.O.
EL=109'-0"
T.O.R.O.
EL=109'-0"
T.O.R.O.
EL=109'-0"
T.O.R.O.
EL=111'-10 3/4"
T.O.R.O.
EL=111'-10 3/4"

SECTION B-B


T.O. SUBFLOOR
EL.= 100'-0"
T.O. SLAB

1070 EAST THORNE LANE
FOX POINT, WI

1) 2 Stories Stone Veneer : wall ht = 11'0" = 1100#
8" Block w/ #5 Bars @ 32" c/c OK
for 8'-0 Backfill & Veneer Support
See pp 2-8

V @ Base = $\frac{3040^{\#}}{1.2}$ = 2533 #/ft

Shear in #5 Dowel = 0.31 in² (40 ksi) = 7440#

2533 $\frac{32}{12}$ = 6755# < 7440# OK

2) Check Footing : Dia = 2(2200) = 3'-4 (40+40+40) = Stoopid — Program calculates wall wt.
Footing 27" x 12" w/ #5 Bars @ 12" c/c
Both Ways OK
See pg. 9

INSTALLATION IS ACCEPTABLE AS DRAWN!

WISCONSIN
DAVID E. GROBLEWSKI
E-17754
MILWAUKEE
WI
PROFESSIONAL ENGINEER

12/27/2002

Masonry Wall: MASONRY WALL ANALYSIS AND DESIGN

Project : Fire Place Wall
Location: 1070 East Thorne Lane, Fox Point, WI By: DEG

TIME: 05:12 PM
DATE: 12-27-2002

Page: 2/9

DESIGN METHOD : IBC 2000: Ultimate Strength Design
MASONRY MATERIAL : Hollow Core Concrete Masonry Units
MORTAR TYPE : Type S
MORTAR MATERIAL : Portland Cement Lime Mortar
BLOCK PLACEMENT : Running Bond

MASONRY WALL DATA:

Wall Height	=	8.33 ft.
Nominal Wall Thickness	=	8.00 in.
Depth to c.g. Steel, Wall	=	3.81 in.
Parapet Height	=	0.00 ft.
Nominal Parapet Thickness	=	0.00 in.
Depth to c.g. Steel, Parapet	=	0.00 in.
Design Strip Width	=	12.00 in.
Main Wall Reinf. Layers	=	One Layer
Wall Grout Spacing	=	Partially Grouted
Support Type at Base	=	Pinned Support
Span Type	=	Supported Top and Bottom

WALL LOADS:

Wall Weight	=	40.00 psf.
Floor or Roof Load: Dead	=	2,200.0 lb
Live	=	0.0 lb
Eccentricity	=	0.00 in.
Additional Vertical Load: Dead	=	0.0 lb
Live	=	0.0 lb
Eccentricity	=	0.00 in.
Vertical Distance (y)	=	0.00 ft.
Equivalent Fluid Pressure	=	35.00 pcf.
Vertical Distance (x)	=	8.00 ft.

SEISMIC LOADS:

Site Class (A to F)	=	Class D
Seismic Use Group	=	I
Short Period Spectral Acceleration, Ss	=	10.00 g
One Second Spectral Acceleration, S1	=	< 0.75 g
(Computed) Design Category,	=	Category A
Parapet Component Importance Factor, Ip	=	1
Parapet Height/Roof Height Ratio z/h	=	0
Veneer Weight	=	0.00 psf.
Seismic Load on Main Wall	=	4.00 psf.
Seismic Load on Parapet Wall	=	1.71 psf.

Project : Fire Place Wall
Location: 1070 East Thorne Lane, Fox Point, WI
Time: 05:14 PM
DATE: 12-27-2002

By: DEG
Page: 3/9

WIND LOADS:

Load # W or H	Magnitude (plf, lb)	Distance From Base of Wall (ft) Start	End
1			
2			
3			
4			
5			

Notes: 1. "W" designates a uniform distributed wind load.
"H" designates a concentrated horizontal wind load.
2. Horizontal loads are positive to the right.

MASONRY DATA:

Masonry Unit Strength = 1900.00 psi.

Masonry Compressive Strength,	f'm	= 1900.00	psi.
Allowable Flexural Stress,	Fb	= N/A	psi.
Allowable Shear Stress,	Fv	= N/A	psi.
Allowable Tension: No Grout,	Ft	= N/A	psi.
Solid Grout,	Ft	= N/A	psi.
Modulus of Elasticity,	Em	= 1,350	ksi.
Modular Ratio, Es/Em =	n	= 21.48	
Single Grouted Cell + Web Width		= 8.31	in.
Nominal Length of Masonry Unit		= 16.00	in.
Block Face Shell Thickness		= 1.25	in.
Nominal Minus Actual Thickness		= 0.38	in.

MATERIAL DATA:

Steel Yield Strength,	Fy	= 60.00 ksi.
Allowable Steel Stress,	Fs	= 24.00 ksi.
Modulus of Elasticity,	Es	= 29,000 ksi.

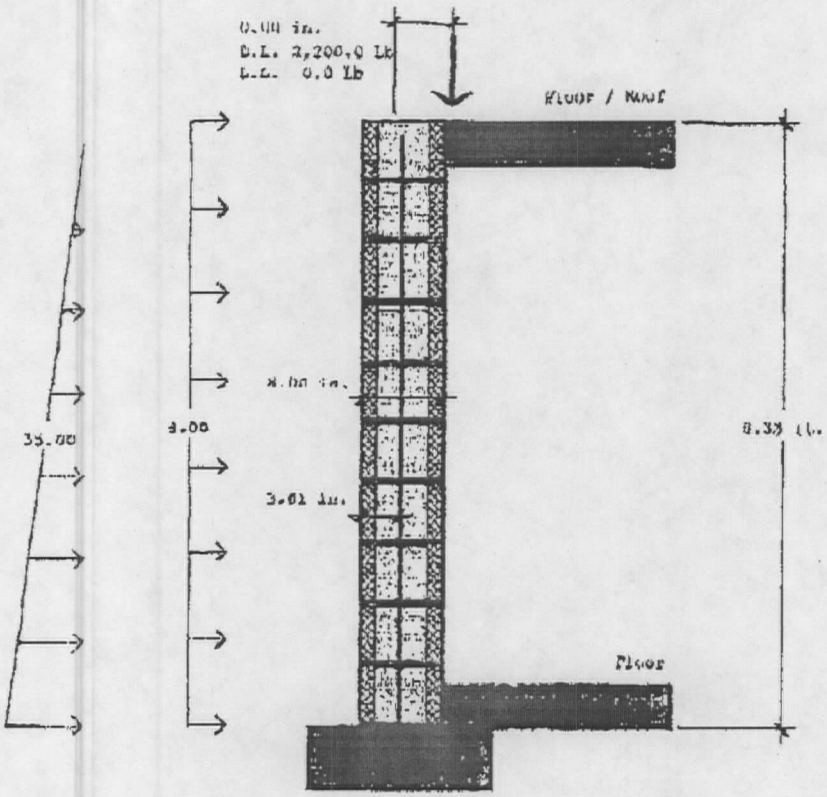
REINFORCED WALL DATA:

Minimum Steel Ratio, As/bt = 0.0007

Project : Fire Place Wall
Location: 1070 East Thiensville Lane, Fox Point, WI By: DEG

TIME: 05:14 PM
DATE: 12-27-2002 Page: 4/9

GRAPHIC SUMMARY OF MASONRY WALL DATA



Project : Fire Place Wall
Location: 1070 East Thorne Lane, Fox Point, WI By: DEG
TIME: 05:14 PM Page: 5/9
DATE: 12-27-2002

SUMMARY OF RESULTS FOR MAIN WALL

DESIGN LOADS: (Based on Graties)

Design Moment, Mu = 1,917.8 ft-lb / 12.00 in.
Axial Load, Pu = 2,879.9 Lb / 12.00 in.
Load Combination = 1.2*DL+1.6*LL

Design Shear, Vu = 1,218.3 Lb / 12.00 in.
Load Combination = 1.2*DL+1.6*LL

ANALYSIS RESULTS:

Design Strip Width = 12.00 in.
Actual Wall Thickness, t = 7.63 in.
Effective Height, h' = 8.33 ft.
h'/t Ratio = 13.11
Seismic Force, (IBC 2000 1620.1.7) Wp = 4.00 psf. / 12.00 in.

Minimum Area of Steel, Vertical Reinf. = 0.064 in.^2 / 12.00 in.
Minimum Area of Steel, Horiz. Reinf. = Not Required
Ref. ACI 99 1.11/IBC 2000 2109.6.5

Flexure Reduction Factor, ϕ = 0.90
Shear Reduction Factor, ϕ = 0.60
All. Service Load Deflection, 0.007*h' = 0.70 in.

DESIGN RESULTS:

Bar Size	P-Delta Results: Delta Service (in.)	Delta Ultimate (in.)	Mu (ft-lb)	ϕMn (ft-lb)	ϕVn (lbs)	Bar Spa. (in. o.c.)
#3	0.08	0.25	1,976.9	2,897.4	8,505.1	8.00
#4	0.15	0.36	2,004.3	2,085.2	4,767.9	24.00
#5	0.19	0.31	2,000.3	2,293.2	4,278.1	32.00 ← USE
#6	0.16	0.36	2,004.0	2,213.7	3,778.2	48.00
#7	0.22	0.46	2,027.6	2,178.2	2,833.7	64.00
#8	0.24	0.47	2,030.6	2,360.1	2,518.8	72.00
#9	0.22	0.43	2,020.8	2,791.2	2,518.8	72.00

Max. vertical bar spacing is 72 inch per ACI 99 2.3.3.3 (commentary)
IBC 2000 places no limits on bar spacing so ACI limits are assumed
Per IBC 2000 2108.9.2.1, bar size is limited to #8

Project : Fire Place Wall
Location: 1070 East Thorne Lane, Fox Point, WI By: DEG

TIME: 05:14 PM
DATE: 12-27-2002 Page: 6/9

DETAILED RESULTS FOR MAIN WALL:

LOAD COMBINATION : 1.2*DL+1.6*LL
REBAR DESIGN : #5 @ 32 in. o.c.
FURNISHED AREA OF STEEL : .116 in^2 / 12.00 in.

No.	Dist from Bot (ft)	Mu (ft-lb)	Pu (lbs)	Vu (lbs)	P-Delta Results: Delta Service (in.)	Delta Ultimate (in.)	Mu (ft-lb)
0	8.33	0.0	2,640.0	-573.7	0.00	0.00	0.0
1	7.50	476.7	2,680.0	-566.6			
2	6.66	933.5	2,720.0	-523.7			
3	5.83	1,338.4	2,760.0	-441.9			
4	5.00	1,659.0	2,799.9	-321.3			
5	4.17	1,862.9	2,839.9	-161.9	0.14	0.34	1,943.7
6	3.33	1,917.8	2,879.9	36.5	0.15	0.34	2,000.3
7	2.50	1,791.4	2,919.9	273.6			
8	1.67	1,451.2	2,959.9	549.7			
9	0.83	864.8	2,999.9	864.6			
10	0.00	0.0	3,039.8	1,210.9			

WALL AND MATERIAL PROPERTIES:

Effective Flange Width bf = 12.00 in. / 12.00 in.
Effective Grouted Core Width, b' = 3.12 in. / 12.00 in.
Depth to c. g. Steel d = 3.81 in.

Modulus of Rupture, fr = 96.82 psi.
Gross Moment of Inertia, Ig = 341.67 in.^4 / 12.00 in.
Section Modulus, S = 2*Ig/t = 90.14 in.^3 / 12.00 in.
Cracking Moment, Mcr = fr*S = 727.3 ft-lb / 12.00 in.

ANALYSIS RESULTS AT MAXIMUM FORCES:

Allowable Axial Limit, Fa = 0.20*f'm = 300.00 psi.
Axial Stress, fa = Pu/Ag = 26.23 psi.

Minimum Area of Steel = 0.064 in.^2 / 12.00 in.
Maximum Area of Steel, (TMS 2108.9.3.1) = 0.288 in.^2 / 12.00 in.
Depth of Compression Block, a = 0.844 in.
Eff. Area of Steel, As = (Asky + Pu)/Fy = 0.164 in.^2
Cracking Moment of Inertia, Icr = 36.66 in.^4 / 12.00 in.
Nominal Moment Capacity, Mn = 2,293.2 ft-lb / 12.00 in.
Nominal Shear, see (ex: 2000 2108.9.3.5.2 = 4,273.1 lb / 12.00 in.

Project : Fire Place Wall
Location: 1070 East Thorne Lane, Fox Point, WI By: DEG
TIME: 05:14 PM Page: 7/9
DATE: 12-27-2002

DETAILED RESULTS FOR MAIN WALL:

LOAD COMBINATION : 1.2*DL+0.5*LL+1*E
REBAR DESIGN : #5 @ 32 in. o.c.
FURNISHED AREA OF STEEL : .116 in^2 / 12.00 in.

No.	Dist From Bot (ft)	Mu (ft-lb)	Pu (lbs)	Vu (lbs)	D-Delta Results: Delta Service (in.)	Delta Ultimate (in.)	Mu (ft-lb)
0	8.33	0.0	2,640.0	-198.9	0.00	0.00	0.0
1	7.50	161.5	2,680.0	-190.4			
2	6.66	313.9	2,720.0	-173.6			
3	5.83	447.4	2,760.0	-144.8			
4	5.00	551.7	2,799.9	-103.7			
5	4.17	616.9	2,839.9	-50.6	0.15	0.02	620.8
6	3.33	632.6	2,879.9	14.7	0.16	0.02	636.6
7	2.50	589.0	2,919.9	92.2			
8	1.67	475.7	2,959.9	181.8			
9	0.83	282.8	2,999.9	283.5			
10	0.00	0.0	3,039.8	397.4			

WALL AND MATERIAL PROPERTIES:

Effective Flange Width bf = 12.00 in. / 12.00 in.
Effective Grouted Core Width, bw = 5.12 in. / 12.00 in.
Depth to C. G. Steel d = 5.81 in.

Modulus of Rupture, fr = 96.82 psi.
Gross Moment of Inertia, Ig = 343.67 in.^4 / 12.00 in.
Section Modulus, S = 2*Ig/t = 90.14 in.^3 / 12.00 in.
Cracking Moment, Mcr = fr*S = 727.3 ft-lb / 12.00 in.

ANALYSIS RESULTS AT MAXIMUM STRESS:

Allowable Axial Limit, Pa = 0.20*f'm = 300.00 psi.
Axial Stress, fa = Ps/Ag = 26.23 psi.

Maximum Area of Steel = 0.061 in.^2 / 12.00 in.
Maximum Area of Steel, (IBC 2108.9.2.1.1) = 0.289 in.^2 / 12.00 in.
Depth of Compression Block, a = 0.644 in.
Eff. Area of Steel, Ase = (Asry * Fy)/Fy = 0.186 in.^2
Cracking Moment of Inertia, Icr = 34.65 in.^4 / 12.00 in.
Nominal Moment Capacity, Mnm = 2,293.2 ft-lb / 12.00 in.
Nominal Shear, see IBC 2000 2108.9.3.5.2 = 4,272.1 lb / 12.00 in.

Project : Fire Place Wall
Location: 1070 East Thorne Lane, Fox Point, WI By: DEG

TIME: 05:14 PM
DATE: 12-27-2002 Page: 8/9

DETAILED RESULTS FOR MAIN WALL:

LOAD COMBINATION : 0.9*DL+1*E
REBAR DESIGN : #5 @ 32 in. o.c.
FURNISHED AREA OF STEEL : .116 in^2 / 12.00 in.

No.	Dist From Bot (ft)	Mu (ft-lb)	Pu (lbs)	Vu (lbs)	P-Delta Results: Delta Service (in.)	Delta Ultimate (in.)	Mu (ft-lb)
0	8.33	0.0	1,990.0	-16.7	0.00	0.00	0.0
1	7.50	12.5	2,010.0	-13.3			
2	6.66	22.2	2,040.0	-10.0			
3	5.83	29.1	2,070.0	-6.7			
4	5.00	33.3	2,100.0	-3.3			
5	4.17	34.7	2,129.9	0.0	0.00	0.00	34.9
6	3.33	33.3	2,159.9	3.3			
7	2.50	29.1	2,189.9	6.7			
8	1.67	22.2	2,219.9	10.0			
9	0.83	12.5	2,249.9	13.3			
10	0.00	0.0	2,279.9	16.7			

WALL AND MATERIAL PROPERTIES:

Effective Flange Width — Df = 12.00 in. / 12.00 in.
Effective Grouted Core Width, — b' = 3.12 in. / 12.00 in.
Depth to c. g. Steel — d = 3.81 in.

Modulus of Rupture, — fr = 96.02 psi.
Gross Moment of Inertia, — Ig = 343.67 in.^4 / 12.00 in.
Section Modulus, — S = 2*Ig/t = 90.16 in.^3 / 12.00 in.
Cracking Moment, — Mcr = fr*S = 727.3 ft-lb / 12.00 in.

ANALYSIS RESULTS AT MAXIMUM FORCES:

Allowable Axial Limit, — Fa = 0.20*f'm = 300.00 psi.
Axial Stress, — fa = Ps/Ag = 25.86 psi.

Minimum Area of Steel = 0.064 in.^2 / 12.00 in.
Maximum Area of Steel, (IBC 2108.9.3.1.3) = 0.279 in.^2 / 12.00 in.
Depth of Compression Block, a = 0.595 in.
Eff. Area of Steel, Ase = (As*Fy + Pu)/Fy = 0.152 in.^2
Cracking Moment of Inertia, Icr = 32.95 in.^4 / 12.00 in.
Nominal Moment Capacity, øMn = 2,122.6 ft-lb / 12.00 in.
Nominal Shear, See IBC 2000 2108.9.3.5.2 = 4,273.1 Lb / 12.00 in.

Footing Design (2000 International Building Code (97 NDS)) Ver: 5.06
By: David E. Groblewski , David E. Groblewski, PE, Inc. on: 12-27-2002 : 5:39:51 PM

Project: Hamm - Location: 1670 E Thome Ln Fox Point WI

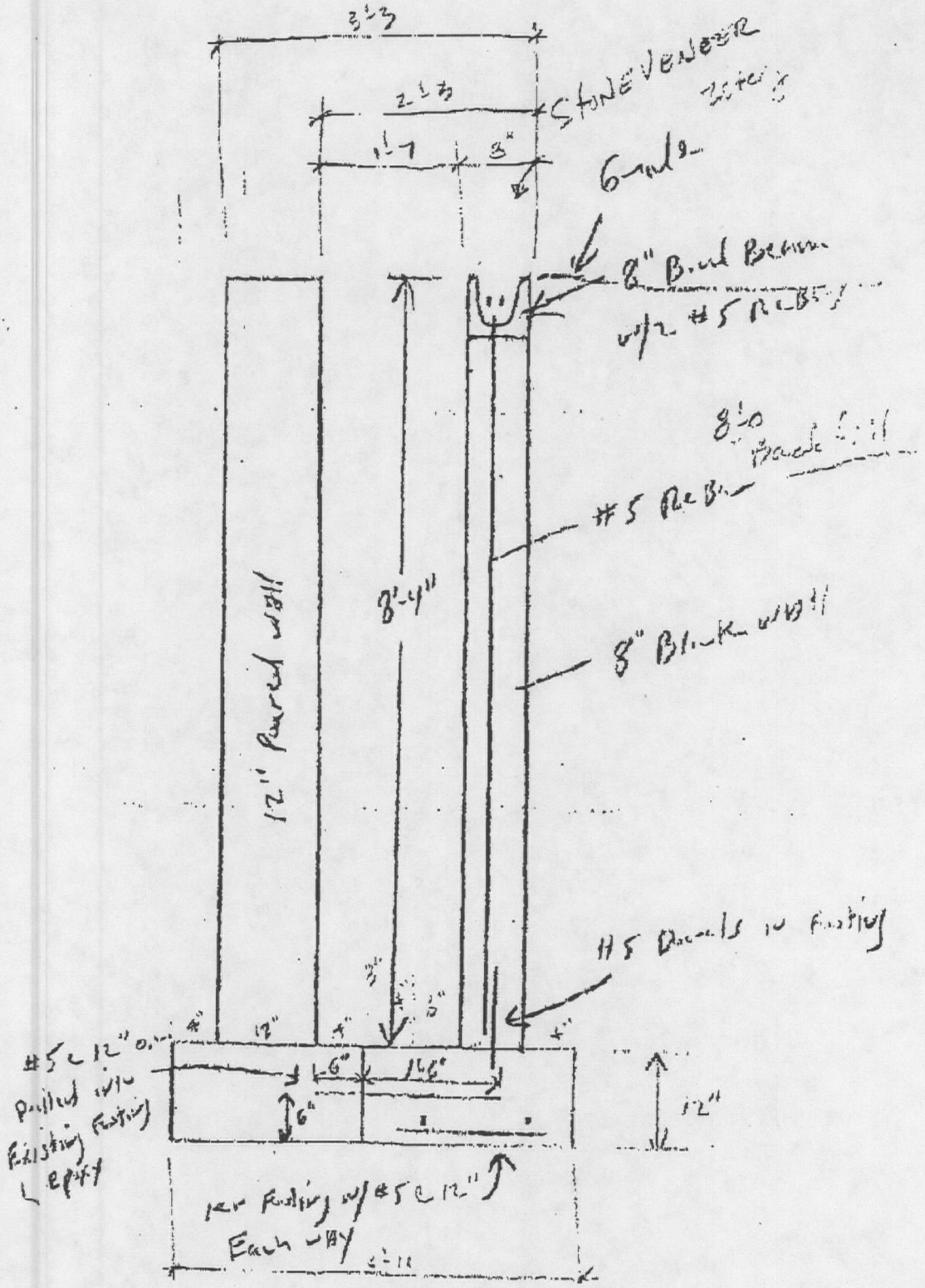
Summary:

Footing Size: 27.0 IN Wide x 12.0 IN Deep Continuous Footing With 20.0 IN Thick x 100.0 IN Tall Stem
Longitudinal Reinforcement: (2) Continuous #5 Bars
Transverse Reinforcement: #5 Bars @ 14.00 IN. O.C. (unnecessary)

Footing Loads:			
Live Load:	PL=	0	PLF
Dead Load:	PD=	4400	PLF
Total Load:	PT=	4400	PLF
Ultimate Factored Load:	Pu=	6160	PLF
Footing Properties:			
Allowable Soil Bearing Pressure:	Qs=	3000	PSF
Concrete Compressive Strength:	F'c=	3000	PSI
Reinforcing Steel Yield Strength:	Fy=	60000	PSI
Concrete Reinforcement Cover:	cr=	2.50	IN
Footing Size:			
Width:	W=	27.0	IN
Depth:	Depth=	12.00	IN
Effective Depth to Top Layer of Steel:	d=	8.56	IN
Stemwall Size:			
Width:	W=	20.0	IN
Depth:	Depth=	100.00	IN
Bearing Calculations:			
Required Footing Width:	Wreq=	21.96	in
Ultimate Bearing Pressure:	Qu=	1956	PSF
Effective Allowable Soil Bearing Pressure:	Qe=	2400	PSF
Beam Shear Calculations (One Way Shear):			
Beam Shear:	Vu1=	0	LB
Allowable Beam Shear:	vc1=	9587	LB
Bending Calculations (Transverse):			
Factored Moment:	Mu=	8242	IN-LB
Nominal Moment Strength:	Mn=	116291	IN-LB
Reinforcement Calculations (Transverse):			
Concrete Compressive Block Depth:	a=	0.51	IN
Steel Required Based on Moment	As(1)=	0.02	IN2
Minimum Code Required Reinforcement (Shrinkage/Temperature /As(2)=5.4):		0.26	IN2
Controlling Reinforcing Steel:	As reqd=	0.26	IN2
Selected Reinforcement:	#5 Bars @ 14.00 IN. O.C.		
Reinforcement Area Provided:	As=	0.26	IN2/FT
Development Length Calculations:			
Development Length Required:	Ld=	16.43	IN
Development Length Provided:	Ld-prov=	6.00	IN

Note: Plain concrete adequate for bending, therefore adequate development length not required.

Reinforcement Calculations (Longitudinal):			
Minimum Code Required Reinforcement (Shrinkage/Temperature /As(2)=5.4):		0.58	IN2
Selected Reinforcement:	(2) Continuous #5 Bars		
Reinforcement Area Provided:	As=	0.61	IN2


3'-3"
2'-3"
Stone Veneer
1'-7"
8"
6 mil
8" Bond Beam
w/2 #5 ReBars
8" Block Wall
#5 ReBar
12" Poured Wall
3'-4"
#5 Dowels in Footing
#5 @ 12" o.c.
Pulled into
Existing Footing
6"
16"
12"
New Footing w/#5 @ 12"
Each Way

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Subject: SHAVERS - FELDMAN

Project No. 2002104

Date: MM By: 7/31/02 Sheet: ____ of ____

(1)

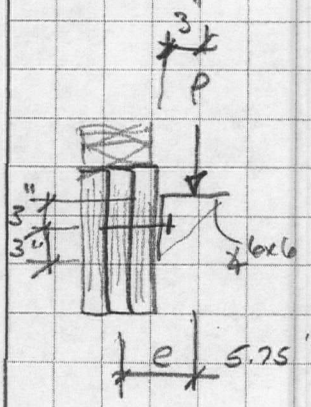
HEADERS

FIRST FLOOR BOX BAY:

→ @ WALL

$$W = (30\,PSF_{SNOW} + 27\,PSF_{ATTIC} + 50\,PSF_{UPPER})(1') = 107\,PLF$$

$$\therefore M = 107\,PLF(14')^2\left(\tfrac{1}{8}\right) = 2{,}622\,LB\cdot FT$$



TORSION DUE TO STONE,

$$P = 85\,PSF(10\,FT) = 850\,PLF \quad (\text{FOR } 10' \text{ HIGH STONE})$$
OR 850#/FT OF WALL

$$\therefore T = P \cdot e = 850^{\#}(5.75'') = 4{,}888''\cdot LB$$

SINCE ENDS ARE BEARING ON STONE ↑ # LAG BOLTS TORSION OK

$$\text{TENSION IN LAG BOLTS} = \frac{850^{\#}(3'')}{3''} = 850^{\#}/FT$$

S.G. = 0.5 FOR 1.8E MICRO LAM 3¼"

$$\therefore W = 513^{\#}/IN(4'')(C_D 0.9) = 1850^{\#}/BOLT$$

$$\text{SPACING} = \frac{1850^{\#}/BOLT}{850^{\#}/FT} = 2.2\,FT$$

→ USE ¾"ϕ LAG SCREWS @ 18" O/C & 3" @ ENDS

∠ 6x6x6x⅜

$$M = 850 \times 3'' = 2550\,LB\cdot IN \qquad F_b = 0.75(36) = 27\,KSI$$

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Subject: SHOKERS - FELOMAN

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HEADERS (CONT):

$$t_{req'd} = \sqrt{\frac{6M}{bF_b}} = \sqrt{\frac{6(2.55\text{K}\cdot\text{IN})}{(12")27\text{KSI}}} = 0.217" < 3/8" \text{ OK}$$

→ USE 4 6x6x3/8 w/ 3/8" GUSSETS @ 24" o/c

→ @ WINDOW HEAD

SPAN = 13' TRIB WIDTH = 2 FT

$$W = \underset{\text{SNOW}}{30\text{PSF}} + \underset{\text{DEAD}}{10\text{PSF}} = 40\text{ PSF} \; ; \; M = \frac{40(13')^2}{8} = 845^{\#\cdot FT}$$

FOR (3) 2x8 ; $S_x = 39.42 IN^3$, $I_x = 142.9 IN^3$

$$f_b = \frac{845^{\#}FT(12/1)}{39.42} = 257\text{ PSI} < F_b^* = 1.15(850") \text{ D.F. No. 2} = 978\text{ PSI} \quad \text{OK}$$

$$\Delta_{TL} = \frac{5(40\text{ PLF})(13')^4(1728)}{384(1.6\times10^6)(142.9)} = 0.112" \approx L/1390 \quad \text{OK}$$

→ USE (3) 2x8's

→ @ WALL HEADER

$$W = \underset{\text{GRAVITY}}{107\text{PLF}} + \underset{\text{STONE}}{850\text{ PLF}} = 957\text{ PLF}$$

$$M = 957(14')^2/8 = 23,447\text{ LB}\cdot\text{FT}$$

⇒ TRY (3) 1 3/4 x 11 7/8 LVL, M = 26,775 LB·FT, I = 732 IN⁴

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Subject: SHOWERS - FLEMING

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HEADERS (CONT.)

$$\Delta_{TL} = \frac{5(957\,PLF)(14')^4(1728)}{384(1.9\times10^6)(732\,IN^4)} = 0.595" = L/282 \quad NG$$

⇒ FOR (3) 1 3/4" × 14" LVL, $M = 36{,}390\,\#\cdot FT$, $I_x = 1200\,IN^4$

$$\therefore \Delta_{TL} = 0.595"\left(\frac{732\,IN^4}{1200\,IN^4}\right) = 0.36" \approx L/467 \quad SAY \ \underline{OK}$$

→ USE (3) 1 3/4" × 14" LVL

FIRST FLOOR OPG. < 5'-0"

TRIB WIDTH = 11'-0" (MAX.), $w = 107\,PSF(11') + 850\,PLF_{STONE} = 2027\,PLF$

$M = 2027(5)^2/8 = 6{,}334\,LB\cdot FT$

⇒ FOR (3) 2×12, $S_x = 94.9\,IN^3$, $I_x = 534\,IN^4$

$$f_b = \frac{6334(\frac{12}{1})}{94.9\,IN^3} = 801\,PSI < F_b^* = 1.15(850\,PSI) = 977\,PSI \ OK$$

$$\Delta_{TL} = \frac{5(2027\,PLF)(5')^4(1728)}{384(1.6\times10^6)(534\,IN^4)} = 0.033" \approx L/1800 \quad \underline{OK!}$$

→ USE (3) 2×12 w/ ✓

FIRST FLOOR OPG. UP TO 8'

$M = 2027(8')^2/8 = 16{,}220\,\#\cdot FT$

⇒ FOR (3) 1 3/4" × 11 7/8" LVL, $M = 26{,}775$, $I_x = 732\,IN^4$

$$\Delta_{TL} = \frac{5(2027)(8')^4(1728)}{384(1.9\times10^6)(732)} = 0.134" \approx L/714 \quad \underline{OK}$$

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Subject: SHOVERS - FELDMAN

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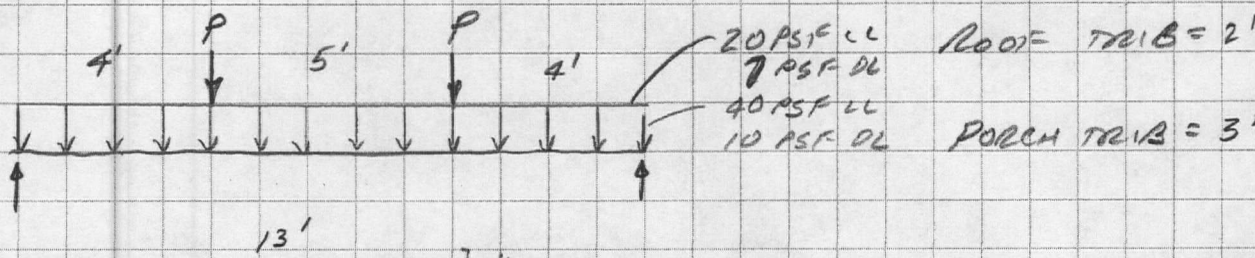
HEADERS (CONT.)

FIRST FLOOR @ BREAKFAST



3/4" BRICK

WALL WT. @ GABLE = $8'(10PSF)(\frac{1}{2}) = 40\ PLF$

$\therefore P = (27PSF(2FT) + 40PLF)\left(\frac{5'+4'}{2}\right) = 423^{\#}$ SAY $1000^{\#}$

$W = 50PSF(3FT) = 150\ PLF$

$\therefore M = 1000^{\#}(4') + \frac{150PLF(13')^2}{8} = 7,169\ LB\cdot FT$

$\Rightarrow$ FOR (3) $1\frac{3}{4}" \times 11\frac{7}{8}"$ LVL, $M = 26,775\ LB\cdot FT$, $I_x = 732.IN^4$

$$\Delta_{TL} = \frac{5(150)(13')^4(1728)}{384(1.9\times10^6)(732)} + \frac{1000(4')}{24(1.9\times10^6)(732)}\left[3(13')^2 - 4(4')^2\right]$$

$$= 0.0693 + 0.0001 = 0.070" \approx L/2250 \quad \underline{OK!}$$

$\rightarrow$ USE (3) $1\frac{3}{4} \times 11\frac{7}{8}"$ LVL

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Subject: SHOWERS

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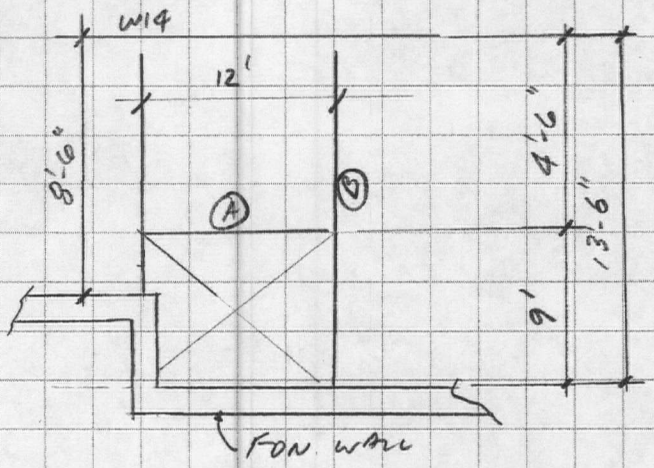
MAIN FLOOR FRAMING:

HEADERS AROUND STAIR



FOR (A)

$w = (60\,PSF + 50\,PSF)\left(\frac{4.5'}{2}\right) = 225\,PLF$

$M = \frac{1}{8}(225)(12')^2 = 4050\,\#\cdot'$

$L/600 = \frac{12(12)}{600} = 0.24"$

$I_{REQ'D} = \frac{5(225)(12)^3(1728)}{384(1.9\times10^6)(0.24")} = 230.4\,in^4$

→ USE $1\frac{3}{4}" \times 11\frac{7}{8}"$ LVL

$R = \frac{1}{2}(225)(12) = 1350\,\#$

FOR (B)

(SEE OUTPUT NEXT PAGE)

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Subject: STRUCTS

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HEADERS (CONT.)

PATIO ROOF

SPAN = 6'-5" TRIB. WIDTH = 2' + 6' = 8' (CONSERV.)

$w = (20PSF + 10PSF)(8') = 240PLF$

$M = 240PLF(6.5')^2(\frac{1}{8}) = 1268^{\#}\cdot{}'$ LIMIT TO 8" DEPTH

$S_{REQ'D} = \frac{1268(\frac{12}{1})}{1.15(850PSI)} = 15.6IN^3 \Rightarrow (2)\ 2\times10 = 27.8IN^3$ OK

$\Delta_{TL} = \frac{5(240)(6.5)^4(1728)}{384(1.6\times10^6)(2)(98.93)} = 0.03" \approx L/2560$ OK

$\Rightarrow$ TRY (3) 2×8, $S = (3)(13.14) = 39.42IN^3$

$> S_{REQ'D}$ OK

USE (3) 2×8 HEADERS

MASTER BR (@ PORCH)

L = 11FT.

POST REACTION = 4500# (CONSERV. FROM SITTING AREA CALCS.)

$M = 4500^{\#}(11)(\frac{1}{4}) = 12,375^{\#}\cdot FT$

$\Rightarrow$ TRY (3) $1\frac{3}{4}\times11\frac{7}{8}$ LVL, $M_R = (3)(8,925^{\#}\cdot') = 26,775^{\#}\cdot'$

$> M$ OK

USE (3) $11\frac{7}{8}\times1\frac{3}{4}$ LVL

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Subject: SHOWERS

Project No. 2002104

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MASTER B.R. PORCH FRAMING

$L = 6'-0"$, $s = 16"$ o/c

$w_{DL} = 7\,PSF + 55\,PSF = 62\,PSF$ (4" STONE)

$w_{LL} = 40\,PSF \Rightarrow w_{TL} = 102\,PSF$

$w_{SL} = 40\,PSF$ (D.N.C DUE TO C_D)

$M = \frac{16}{12}(102)(6)^2/8 = 612\,\#/'$ ⇒ FOR 2x10 $F_b^* = 1.15(1.1)(875) = 1107\,PSI$

$f_b = 612(12)/21.39 = 343 << F_b^*$ OK

$\Delta_{LL} = \frac{5(40)(\frac{16}{12})(6)^4(1728)}{384(1.6\times10^6)(98.93)} = 0.0098"$ OK

MAIN FLOOR HEADER @ MASTER DECK

$L = 14'-0"$ TRIB. WIDTH = 8' WEST + 3' EAST

$w_{DL} = 62PSF(3') + 10PSF(8') = 266\,PLF$

$w_{LL} = 40(3') + 40(8') = 440\,PLF$ ⟩ 706 PLF

$M = 706(14)^2/8 = 17{,}300\,\#/'$

⇒ TRY (3) $11\frac{7}{8}\times1\frac{3}{4}"$ LVL $M_R = 3(8925) = 26{,}775 > M$ OK

$\Delta_{LL} = \frac{5(\frac{440}{706})(706)(14)^4(1728)}{384(1.6\times10^6)(3)(24)} = 0.324" \approx L/517 < L/480$ OK

$\Delta_{TL} = \frac{706}{440}(0.324) = 0.519" = L/323$ SAY OK

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Subject: SHOWERS RES.

Project No. 2002204

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HEADERS (CONT.)

MASTER ANTE: SPAN = 7.5' TRIB. WIDTH = 11'

$$w = (20\ PSF_{LL} + 10\ PSF_{DL})(11') = 330\ PLF$$

$$M = 330(7.5)^2\left(\tfrac{1}{8}\right) = 2{,}320^{\#'}$$

⇒ TRY (3) 2×10 $S = (3)(21.39\ in^3) = 64.2\ in^3$

$I_x = 296.79\ in^4$

$$F_b^* = 1.0(850\ psi) = 850\ psi$$

$$S_{REQ'D} = \frac{2320(12)}{850} = 32.8\ in^3 < S \quad \underline{OK}$$

$$\Delta_{TL} = \frac{5(330)(7.5)^4(1728)}{384(1.6\times10^6)(296.8)} = 0.05'' \Rightarrow L/1800 \quad \underline{OK}$$

USE (3) 2×10

ATTIC ABOVE SEATING AREA: SPAN = 14'

POST REACTION = 4500# (FROM CATHEDRAL CEILING CALCS.)

$$M = 4500(14)\left(\tfrac{1}{4}\right) = 15{,}750^{LB\cdot FT}$$

FOR (3) 1 3/4 × 11 7/8" LVL, $M_R = 3(8{,}925) = 26{,}775 > M$ OK

$$\Delta_{TL} = \frac{4500(14)^3(1728)}{48(1.9\times10^6)(3)(24.6)} = 0.32'' \approx L/525$$

OK

USE (3) 1 3/4 × 11 7/8 LVL

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Subject: SHOVERS RES.

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HEADERS (CONT.)

B.R. #3 PORCH DOOR SPAN = 9 FT TRIB. WIDTH = 12'

ROOF + ATTIC LOAD: $w = (30+30\ PSF)(12') = 720\ PLF$

$$M = 720(9)^2\left(\tfrac{1}{8}\right) = 7290\ ^{\#}\cdot F$$

$\Rightarrow$ FOR D.F. No. 2 $F_b^* = {}^{C_D}1.15(850) = 977.5\ PSI$

$$S_{REQ'D} = \frac{7290\left(12''/_{1}\right)}{978} = 89.4\ IN^3 \Rightarrow TRY\ (3)\ 2\times12$$

$S_x = 94.9$

$$\Delta_{TL} = \frac{5(720)(9)^4(1728)}{384(1.6\times10^6)(3)(178)} = 0.12'' \Rightarrow {}^{L}/_{900}\ OK$$

USE (3) 2×12

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Subject: SHOVERS - FERGMAN RES.

Project No. 2002104

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HEADERS - UPPER LEVEL FRAMING

LIVING ROOM

$L = 19'-0"$, $15.5'$ = TRIB WIDTH

LIVE LOAD = 40 PSF (UPPER) + 20 PSF (ATTIC) + 20 PSF (ROOF) = 80 PSF

DEAD LOAD = 10 PSF + 10 PSF + 10 PSF = 30 PSF

110 PSF TOTAL

$\therefore w = 110 PSF (15.5') = 1705 PLF$

$\therefore M = 1705 (19)^2/8 = 76,938 \#\cdot FT$

(3) $1\frac{3}{4}" \times 14"$ $M_R = 3(12,130)$
$= 36,390 \#\cdot FT$
NG!

⇒ TRY A36 STEEL BEAM

W12x35, $M_r = 90 K\cdot FT > 77 K\cdot FT$ OK

$$\Delta_{LL} = \frac{\left(\frac{80}{110}\right) 5 (1.7 KLF)(19)^4 (1728)}{384 (29,000 KSI)(285 IN^4)} = 0.44" \approx L/519 \text{ SAY OK}$$

USE W12x35 (A36)

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Subject: SHORES FERGUSON RES.

Project No. 2002104

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HEADERS - UPPER LEVEL (CONT.)

KITCHEN

$L = 14'$, TRIB WIDTH = 12'

$w = 110PSF(12') = 1320PLF$

$M = 1320(14)^2/8 = 32,340^{\#-'}$

For (3) $1\frac{3}{4}$" x 14"
$E = 1.9 \times 10^6$

$\Delta_{LL} = \frac{\frac{80}{110}(5)(1.32^{KLF})(14')^4(1728)}{384(1.9\times10^3)(1201.IN^4)} = 0.364"$

$\approx L/462$ OK

$M_R = 3(12130) = 36,390^{\#-'}$

$I = \frac{1}{12}(5.25)(14)^3 = 1201.IN^4$

USE (3) $1\frac{3}{4}$x14" MICRO LAMS GLUED & NAILED TOGETHER

GARAGE DOORS

$L = 8'-0"$ $w = (30PSF + 50PSF) = 80PSF$

$M = 80(8)^2(\frac{1}{8}) = 640LB\cdot FT$

$S_{REQ'D} = \frac{640\times12}{1.15(850PSI)} = 7.9IN^3$

$\Delta \leq L/600 = 0.160$

$I_{REQ'D} = \frac{5(640)(8)^4(1728)}{384(1.6\times10^6)(0.160")} = 230.IN^4$

USE (3) 2x12

$I_x = 534.IN^4$

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Subject: SHOVERS-FELDMAN

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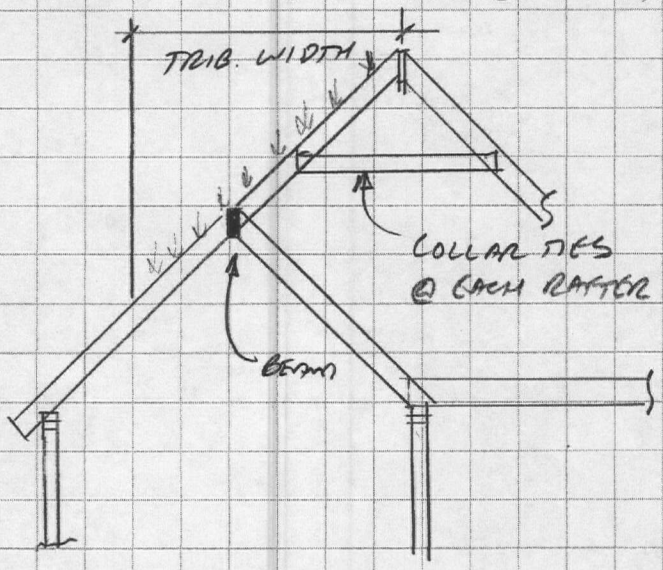
D

CATHEDRAL CEILINGS:

SITTING AREA

SPAN = 24'-0"



TRIB WIDTH = $\frac{9'}{2} + 8' = 12.5'$

$\therefore w = (30\,PSF)(12.5\,FT)(24\,FT)^2\left(\frac{1}{8}\right)$ (D+S)

$= 27{,}000\,FT.LB$

FOR $\Delta_{TL} \leq L/240 = 1.20"$

$\leq L/360 = 0.80$

$I_{REQ'D} = \frac{5(30)(12.5)(24)^2(1728)}{384(1.9\times10^6)(0.80")} = 1842\,IN^4$

LIMIT TO 1" $\Rightarrow I_{REQ'D} = \frac{0.8}{1.0}(1842\,IN^4)$

$= 1474\,IN^4$

$\Rightarrow$ (3) $1\frac{3}{4}" \times 16"$ MICRO LAMS

$M_R = 3(15{,}555) = 46{,}665\,LB\cdot FT$ OK

$I = 3(597\,IN^4) = 1792\,IN^2$ $\therefore \Delta < L/350$ OK

$\rightarrow$ USE (3) $1\frac{3}{4}" \times 16"$ LVL

REACTION $= 30(12.5)(24)\left(\frac{1}{2}\right) = 4{,}500\#$

$\Rightarrow$ TRM 6X6 POST, 8.5' HIGH

D-F #1

C_D C_F

$\frac{L_e}{d} = \frac{(1.0)8.5'(12)}{5.5"} = 18.5 < 50$ OK, 36 FOR 16.5' COL.

$F_c^* = 1000(1.15)(1.1) = 1265\,PSI$

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Subject: SHOVERS-FERGMAN

Project No. 2002104

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CATHEDRAL CEILINGS (CONT.)

SIZING AREA (CONT.)

$$C_p = \frac{1+\left(\frac{F_{cE}}{F_c^*}\right)}{2c} - \sqrt{\left[\frac{1+\left(\frac{F_{cE}}{F_c^*}\right)}{2c}\right]^2 - \frac{\frac{F_{cE}}{F_c^*}}{c}}$$

$$F_{cE} = \frac{K_{cE}E'}{\left(\frac{l_e}{d}\right)^2} \qquad c=0.8,\ K_{cE}=0.3,\ K_e=1.0$$

$$= \frac{0.3(1{,}600{,}000)}{18.5^2} = 1402\ PSI$$

303 FOR 16.5' LONG

$$\therefore \frac{F_{cE}}{F_c^*} = \frac{1402\ PSI}{1265\ PSI} = 1.11$$

$$C_p = \frac{1+1.11}{2(0.8)} - \sqrt{\left[\frac{1+1.11}{2(0.8)}\right]^2 - \frac{1.11}{0.8}} = 0.726$$

$$P_{allow} = F_c^* C_p A = 1265\,(0.762)\,(30.25) = 29{,}200\ PSI$$

$$>> 4500\ PSI \quad \underline{\underline{OK}}$$

→ USE 6x6 POST

⇒ CONNECTIONS

UPPER RAFTER: DL+SL = 1.3'(30PSF)(12')($\frac{1}{2}$) = 234#

WL (UPLIFT) = 1.3'(10PSF)(12')($\frac{1}{2}$) = 78#

→ USE LSU HANGER

POST: BCQ BASE
BCQ CAP

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Subject: SHAVERS - FELDMAN

Project No. 2002104

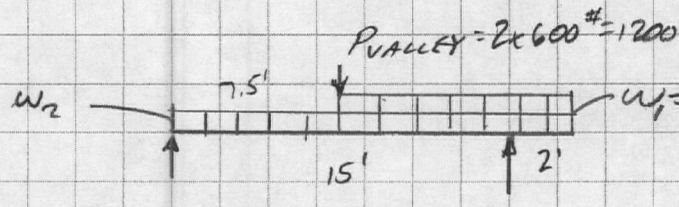
Date: 8/2/02 By: MM Sheet: ____ of ____

(3)

CATHEDRAL CEILINGS (CONT.)

MASTER BEDROOM:

SPAN = 15'-0"



W_2 = 10PSF (8FT) = 80PLF

M = 9.0 K-FT

→ USE (3) 1 3/4 x 11 7/8" LVL (PER TJ-BEAM SOFTWARE)

VALLEY BEAMS → SPAN = 10'-0", $P = 30PSF(4\,JS.F.)\left(\frac{1}{2}\right) = 600\#$

$$S_{REQ'D} = \frac{30\,(10)^2\left(\frac{1}{8}\right)\left(\frac{12}{1}\right)}{1.15_{CD}\,(850PSI)} = 4.6\,IN^3$$

FOR 2x12 $S_x = 31.6\,IN^3$ OK

→ USE 2x12 @ VALLEYS

LIBRARY:

SPAN = 12'-6' TRIB WIDTH = 7'-0"

$$W = 30PSF_{ROOF} + 10PSF_{CEILING}\,(7') = 280PLF$$

→ USE (3) 1 3/4" x 9 1/4" LVL (PER TJ-BEAM SOFTWARE)

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Subject: SMOVERS - FELDMAN RES.

Project No. 2002104

Date: 7/11/02 By: MM Sheet: ____ of ____

MAIN FLOOR BEAMS

HOUSE WIDTH = 30'-0" (AVG.)
HOUSE LENGTH = 65'-6" (INSIDE DIM)

⇒ FROM UDC TABLE 21.22-A1

15' COL SPACING, A36 STEEL, ZONE 2

USE W14x26

BASEMENT COLUMNS:

SAY H=10' (CONSERVATIVE, ACTUAL HT.=8')

MAX. TRIB. AREA = 13' x (11' + 12') (CONSERV. SOUTH END) = 300 S.F.

LOADS = 50 PSF (MAIN FLOOR)
50 PSF (UPPER FLOOR)
30 PSF (ATTIC)
30 PSF (ROOF, INCL. SLOPE REDUCT.)
160 PSF

∴ MAX COL. LOAD = 300 S.F. (160 PSF) = 48,000 #

⇒ FROM UDC TABLE 21.25-E

USE 4" ϕ STEEL PIPE
F_y = 36,000 PSI

O/C PER ATTIC FRAMING CHANGE 11/22/02

P ALLOW = 49,000 FOR H=10'
54,000 FOR H=8

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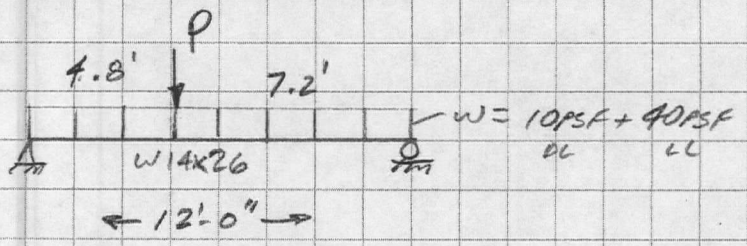
Subject: SHOVORS-FREEMAN

Project No. 2002104

Date: 7/31/02 By: MM Sheet: ____ of ____

MAIN FLOOR BEAMS

✓ CONCENTRATED LOADS FROM MAIN FLOOR COLS.



$P = \frac{1}{2}(1705\,PLF)(19.5') = 16.6^K$

$W = 50\,PSF(15') = 750\,PLF$

$M = 60.8^{K\cdot FT}$ $F_b = 22\,KSI$ $f_b = 20.7\,KSI$ OK

$\Delta_{TL} = 0.187'' \approx L/770$ OK

⇒ CHECK FOR ADD'L 20PSF ATTIC LL (11/22/02)

$P_{REVISED} = \frac{1}{2}(2015)(19.5) = 19.6^K$

$M_{REV.} = 69.4^{K\cdot FT}$ $f_b = \frac{69.4(12)}{36.3} = 23.6\,KSI > F_b$ SAY OK (SINCE ONLY ½ OF ATTIC LOADED, SAY OK)

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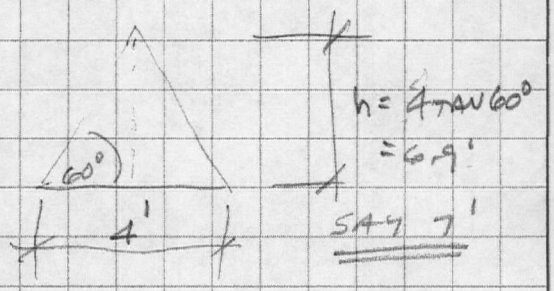
Subject: SHOWERS

Project No. 2002104

Date: 11/15/02 By: MM Sheet: ____ of ____

LINTEL @ BSMT. T.V.



SPAN = 4'-0" (SAY 5'-0")

$\Delta \leq L/600 = 0.08"$

$w_{DL} = 7'(38\ PSF) + 500\ PLF = 766\ PLF$

(38 PSF: ↑ 8" CMU; 500 PLF: ↑ SLAB + MISC.)

$w_{LL} = 40\ PSF\ (1') = 40\ PLF$ (ALLOWANCE FOR 1 JOIST SPACE)

$\therefore w_{TL} = 766 + 40 = 806\ PLF$

$M = 806(5)^2/8 = 2520\ ^{\#}{}'$

$S_{x\ REQ'D} = \dfrac{2520(12/1)}{0.66(36)} = 1.3\ IN^3 \Rightarrow$ TRY W8x10 $S_x = 7.8\ IN^3$, $I_x = 30.8\ IN^3$

$\Delta = \dfrac{5}{384}\dfrac{(.806)(5)^4(1728)}{29000(30.8)} = 0.013" < L/600$ OK

USE W8x10 + 5/16" PL
MIN 8" BEARING EACH END

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Subject: SHOVORS-FRIEDMAN RES.

Project No. 2002104

Date: 7/9/02 By: MM Sheet: ____ of ____

MAIN FLOOR JOISTS:

DEAD LOADS:

3/4" T&G PLYWOOD	=	2.3 PSF
CARPET & PAD	=	1.0 PSF
TJI JOISTS (4PLF)	=	4.0 PSF
MISCELLANEOUS	=	1.5 PSF
		8.8 PSF

SAY DL = 10.0PSF

TYPICAL JOISTS:

$S = 16" = 1.33'$ $\quad \Delta_{LL} \leq L/480$

$\therefore$ LL = 40 PSF (1.33') = 53.2 PLF
TL = 50 PSF (1.33') = 66.5 PLF

FOR 14" DEEP, 16" O/C USE

- 14" TJI/PRO250 UP TO 21'-9" SPAN
- 14" TJI/PRO 350 UP TO 23'-2" SPAN
- 14" TJI/PRO 550 UP TO 26'-3" SPAN

FOR L=22', R_{MAX} = 67 PLF (22') $(\frac{1}{2})$
= 737#
MIT HANGER R_{ALLOW} = 1440# OK

⇒ ALTERNATE FOR SPRUCE-PINE-FIR NO. 2

F_b = 875 PSI $\quad E = 1.4 \times 10^6$ PSI

→ TRY 2x12, $A = 16.88 in^2$, $S = 31.64 in^3$, $I = 178.0 in^4$

$F_b^* = 1.15(1.0)(875 PSI) = 1006 PSI$

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Subject: SHOVERS - FREEMAN RES.

Project No. 2002104

Date: 7/9/02 By: MM Sheet: ____ of ____

MAIN FLOOR JOISTS (CONT.)

⇒ FOR L_{MAX} = 19'-0", $M = \frac{50PSF(19')^2}{8} = 2256^{\#\cdot'}$

$f_b = \frac{2256^{\#\cdot'}\left(\frac{12}{1}\right)}{31.64_{IN^3}\ (2\times12)} = 856\ PSI < F_b^* = 1006\ PSI$ OK

$\Delta_{LL} = \frac{5(40PSF)(1.3')(19.0')^4(1728)}{384(1.4\times10^6_{PSI})(178.0_{IN^4})} = 0.612" \approx L/372 < L/480$

⇒ FOR L_{MAX} = 15'-0"

$\Delta_{LL} = 0.238" \approx L/757 > L/480$

2×12 JOIST @ 16" O/C OK UP TO 15'-0"

⇒ MUD ROOM $L = 9.5'$ $M = 564^{\#\cdot'}$

$f_b = \frac{564^{\#\cdot'}\left(\frac{12}{1}\right)}{21.39_{IN^3}} = 316\ PSI$

$F_b^* = 1.15(1.1)(875PSI) = 1107\ PSI > f_b$ OK

$\Delta_{LL} = \frac{5(40)(1.3')(9.5')^4(1728)}{384(1.4\times10^6)(98.93)} = 0.0689" \approx L/1660$

→ USE 14" TJI/PRO 250 TO MAINTAIN SAME T/WALL DETAIL

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Subject: SHOVERS - FELAMAN RES.

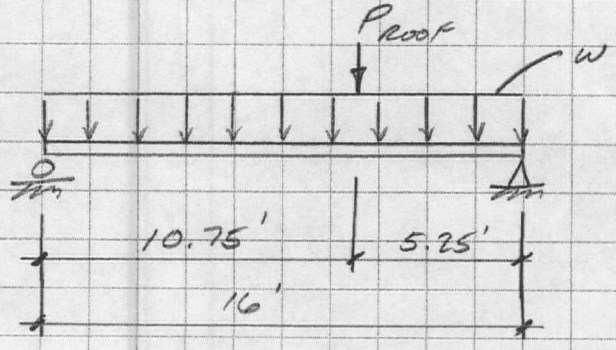
Project No. 2002104

Date: 7/12/02 By: MM Sheet: ____ of ____

ATTIC FRAMING:

16" O/C, 2x FRAMING

$W = 20\,PSF + 7\,PSF = 27\,PSF$
(STORAGE, DEAD)



P_{ROOF} = RAFTER REACTION @ KNEE WALL

$= \frac{1}{2}(29\,PSF)_{(SNOW+DL)}\left(\frac{12}{12}\right)(15+7.5')$

$= 312\#$

$\Rightarrow$ FOR 2x10

$F_b^* = 1.15(1.15)(1.1)(875\,PSI) = 1273\,PSI$
(C_R C_D C_F)

$M = \frac{312\#(10.75')(5.25')}{16'} + \frac{1}{8}(27PSF)\left(\frac{12}{12}\right)(16')^2$ (1100, 864)

$M = 1964\,\#\cdot FT$

$f_b = \frac{1964\left(\frac{12}{1}\right)}{21.39} = 1102\,PSI$

$< F_b^*$ OK

$\Rightarrow$ DEFLECTION

$\Delta_{TL} = -0.569'' \approx L/337 < L/240$ OK
[FROM RISA 2D]

USE 2x10 CEILING JOISTS @ 12" O.C.

SEE REVISED CALC 11/22/02

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Subject: SHOVERS RES.

Project No. 2002104

Date: 11/22/02 By: MM Sheet: ____ of ____

ATTIC FRAMING (REV.)

- OWNER WOULD LIKE TO FINISH ATTIC IN FUTURE

∴ INCREASE LL TO 40 PSF

$M_{ADDL} = (20)(16)^2/8 = 640^{\#}\cdot FT$

$M_{TOTAL} = 1964 + 640 = 2604^{\#}/_{'}$

→ TRY 2x10 @ 12" O/C $S_x = 21.39\ IN^3$ $F_b^* = 1273\ PSI$

$f_b = 2604(12)/21.39 = 1461\ PSI > F_b^*$ NG

→ TRY 2x12 @ 12" O/C $S_x = 31.64\ IN^3$ $F_b^* = 1.15(1.15)(1.0)(875)$
$= 1157\ PSI$

$f_b = 2604(12)/31.64 = 988\ PSI < 1157$ OK

$\Delta_{TL} = -0.434" \approx L/442 < L/240$ OK (RISA 2D)

$\Delta_{LL} = -0.393 \approx L/488 < L/480$ OK (RISA 2D)

USE 2x12 @ 12" O.C.

✓ COLUMNS ⇒ $P_{MAX} = 300\ SF\ (180) = 54000^{\#}$ (LESS SINCE ALL OF ATTIC NOT "LIVEABLE")
$\approx P_{ALLOW} = 54,000^{\#}$ OK

✓ LIVING ROOM BM. ⇒ $W_{TR} = (110 + 20)(15.5) = 2015^{\#}/_{'}$
$M_{TR} = 2015\ (19)^2/8 = 90,927^{\#}/_{'}$
$M_R\ (W12x35) = 90^{K}\cdot FT$ SAY OK (NO ATTIC LOAD ON WEST SIDE)
$\Delta_{LL} = \frac{100}{80}(0.44) = 0.55" \approx L/415 > L/480$ SAY OK

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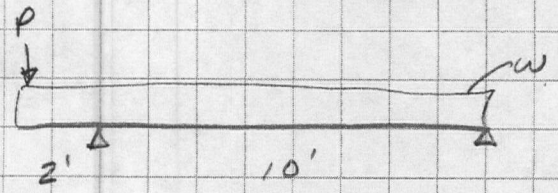
Subject: SHOVERS RES.

Project No. 2002104

Date: 1/12/03 By: MML Sheet: ____ of ____

JOISTS @ MASTER WARDROBE

TRY 14" TJI 250 @ 1'-4" O/C , L = 12'



$w_{LL} = 40 PSF \left(\frac{16}{12}\right) = 53.3 PLF$

$w_{DL} = 10 PSF \left(\frac{16}{12}\right) = 13.3 PLF$

$P_{ROOF} \Rightarrow (10+20)\left(\frac{18'}{2}\right)\left(\frac{14'}{2}\right) + (10+20)(17')(14') = 7350^{\#}$
(LIBRARY) (MAIN)

$w_{ROOF} \Rightarrow 7350^{\#}/14' = 525^{PLF} \Rightarrow P_{ROOF} = 525\left(\frac{16}{12}\right) = 700^{\#}/JST$

$P_{ATTIC} = (10+40)(12')\left(\frac{1}{2}\right)(14') = 4200^{\#}$

$w_{ATTIC} = 4200/14 = 300 PLF \Rightarrow P_{ATTIC} = 300\left(\frac{16}{12}\right) = 400^{\#}/JST$

$\therefore P = 1100^{\#}$ PER JOIST

14" TJI PRO 250 OK *

(SEE OUTPUT)

* INSTALL BLOCKING BETWEEN 14" TJI'S @ 2x6 WALL

- AS BUILT NOTE: (3) 2x12 HEADER INSTALLED AT TOP OF WARDROBE WALL. THIS HEADER DISTRIBUTES ATTIC AND ROOF LOADS ABOVE TO JOISTS PER CALC. ABOVE.

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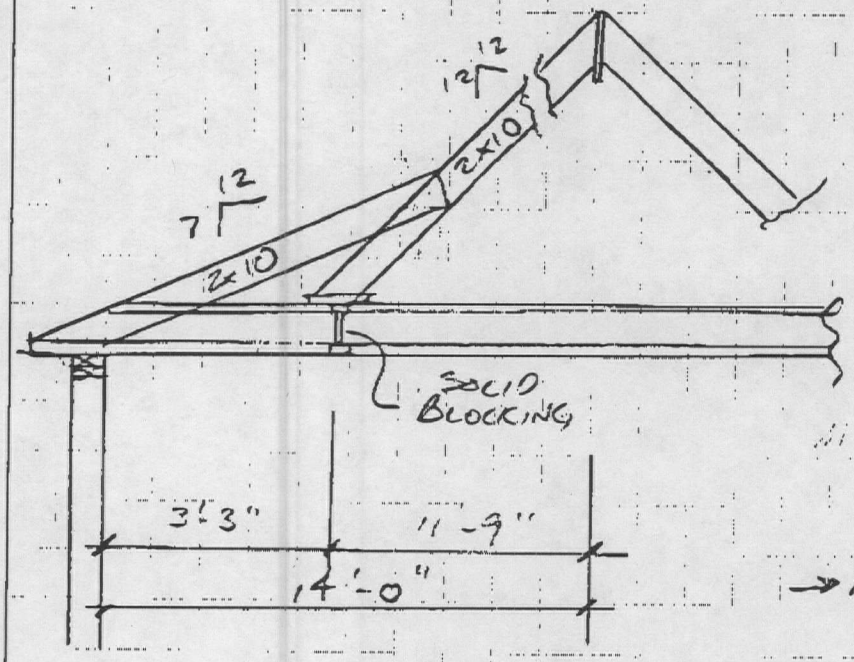
Subject: Showers Res.

Project No. 2002104

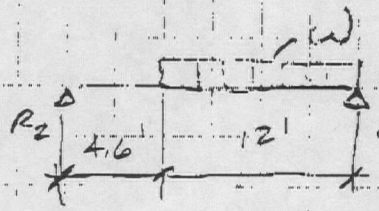
Date: _____ By: MML Sheet: ____ of ____

GARAGE ATTIC JOISTS (AS-BUILT) - NORTH SIDE

- NORTH SIDE JOISTS (@ 12/12), $L = \frac{7.5'}{\cos 45} = 16.6'$



$w_1 = 20PSF + 15PSF = 35PSF$

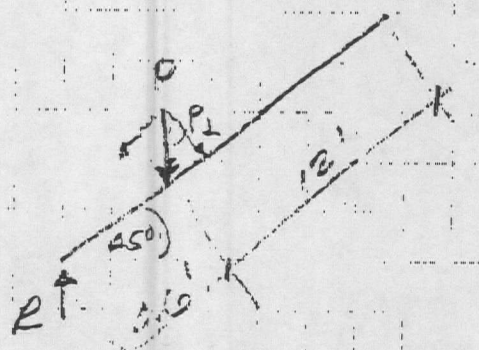


$$R_1 = \frac{35PSF\left(\frac{16'}{12}\right)(12')}{(16.6')(2)}\left(2(16.6')-12'\right)$$

$R_1 = 357.6\#$ $\quad M = \frac{(357.6)^2}{2(35)\left(\frac{16}{12}\right)} = 1{,}370\#'$

→ ADD MOMENT FROM 7/12 AFTER $L \approx 8.5'$ $\quad w = 30PSF - 15PSF = 15PSF$

$$\therefore P = \frac{1}{2}(8.5')(15PSF)\left(\frac{16}{12}\right) = 255\#$$



$P_\perp = \cos 45°(255\#) = 180\#$

$$M_{ADD'L} = \frac{180\#(12')(46')}{16.6'} = 599\#'$$

$M_{TOTAL} = 1{,}370\#' + 599\#' = 1969''$

$R = 359\#$ (FROM RISA)

⇒ FOR 2x10 $\quad f_b = \frac{1969\left(\frac{12}{1}\right)}{21.39\,in^3} = 1{,}104\,PSI$

$$F_b^* = 1.15_{C_D} * 1.15_{C_r} * 850PSI_{F_b} = 1{,}124\,PSI > f_b$$

OK

$\Delta = 0.438'' \simeq L/456 < L/240$ OK (FROM RISA)

USE 2x10 @ 16" o/c

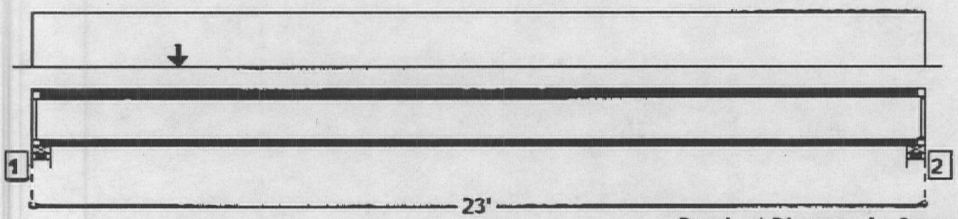
Trus Joist
A Weyerhaeuser Business

TJ-Beam(TM) 8.06 Serial Number: 7002114252
User: 2 6/13/03 12:48:47 PM
Page 1 Engine Version: 1.6.44

GARAGE ATTIC JOIST (AS-BUILT)

11 7/8" TJI®/Pro(TM)-550 @ 12" o/c

THIS PRODUCT MEETS OR EXCEEDS THE SET DESIGN CONTROLS FOR THE APPLICATION AND LOADS LISTED



Product Diagram is Conceptual.

LOADS:

Analysis is for a Joist Member.
Primary Load Group - Residential - Living Areas (psf): 40.0 Live at 100 % duration, 10.0 Dead
Vertical Loads:

Type	Class	Live	Dead	Location	Application	Comment
Point(lbs)	Roof(1.25)	259	130	3' 9"	-	

SUPPORTS:

		Input Width	Bearing Length	Vertical Reactions (lbs) Live/Dead/Uplift/Total	Detail	Other
1	Stud wall	5.50"	5.50"	680 / 225 / 0 / 905	A1: Blocking	1 Ply 11 7/8" TJI®/Pro(TM)-550
2	Stud wall	5.50"	5.50"	499 / 135 / 0 / 634	A1: Blocking	1 Ply 11 7/8" TJI®/Pro(TM)-550

-CAUTION: Required bearing length(s) exceed the minimum shown in the TJ Builder's guide for single family residential applications. Limits: End supports, 3 1/2" . Intermediate supports, 3 1/2" with web stiffeners and 5 1/4" without web stiffeners.
-See TJ SPECIFIER'S / BUILDERS GUIDE for detail(s): A1: Blocking

DESIGN CONTROLS:

	Maximum	Design	Control	Control	Location
Shear (lbs)	886	882	2406	Passed (37%)	Lt. end Span 1 under Roof loading
Vertical Reaction (lbs)	886	886	2356	Passed (38%)	Bearing 1 under Roof loading
Moment (Ft-Lbs)	3785	3317	7675	Passed (43%)	MID Span 1 under Floor loading
Live Load Defl (in)		0.448	0.556	Passed (L/596)	MID Span 1 under Roof loading
Total Load Defl (in)		0.579	1.112	Passed (L/461)	MID Span 1 under Roof loading
TJPro		37	30	Passed	Span 1

-Deflection Criteria: HIGH(LL:L/480,TL:L/240).
-Deflection analysis is based on composite action with single layer of 19/32", 5/8" Panels (20" Span Rating) GLUED & NAILED wood decking.
-Bracing(Lu): All compression edges (top and bottom) must be braced at 2' 8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

TJ-Pro RATING SYSTEM

-The TJ-Pro Rating System value provides additional floor performance information and is based on a GLUED & NAILED 19/32", 5/8" Panels (20" Span Rating) decking. The controlling span is supported by walls. Additional considerations for this rating include: Ceiling - None. A structural analysis of the deck has not been performed by the program. Comparison Value: 2.78

PROJECT INFORMATION:

SHOVERS RESIDENCE

OPERATOR INFORMATION:

Mike Loescher, P.E.
Matrix Engineering, L.L.C.

C:\My Documents\Matrix Engineering\Projects\2002104-Shovers-Feldman\2002104-Garage (Revised).smc

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Subject: SHOWERS - FELAMAN RES.

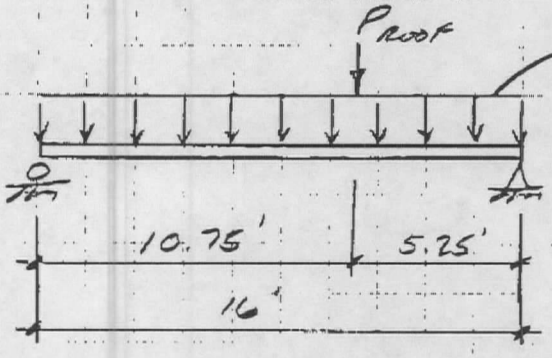
Project No. 2002104

Date: 7/12/02 By: MM Sheet: ____ of ____

ATTIC FRAMING:

16" O/C, 2x FRAMING

$w = 20\,PSF + 7\,PSF = 27\,PLF$
(STRUCT DL)



P_{ROOF} = RAFTER REACTION @ KNEE WALL

$= \frac{1}{2}(29\,PSF)\left(\frac{12}{12}\right)(15 + 7.5')$
(SNOW + DL)

$= 312\#$

$M = \frac{312\#(10.75')(5.25')}{16'}$ (1100)

$\frac{1}{8}(27PSF)\left(\frac{12}{12}\right)(16')^2$ (DEAD)

$M = 1964\#\cdot FT$

⇒ FOR 2x10

$F_b^* = 1.15(1.15)(1.1)(875PSI) = 1273PSI$
$C_R \quad C_D \quad C_F$

$f_b = \frac{1964\left(\frac{12}{1}\right)}{21.39} = 1102\,PSI$

$< F_b^*$ OK

⇒ DEFLECTION

$\Delta_{TL} = -0.569" \approx L/337 < L/240$ OK
[FROM RISA2D]

USE 2x10 CEILING JOISTS @ 12" O.C.

SEE REVISED CALC 11/22/02

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Subject: Sievers Res.

Project No. 2002c04

Date: 11/22/02 By: MM Sheet: ____ of ____

Attic Framing (Rev.)

- Owner would like to finish attic in future

∴ Increase LL to 40 psf

$M_{ADL} = (20)(16')^2/8 = 640$ ft-#

$M_{TOT} = 1964 + 640 = 2604$ ft-#

→ Try 2x10 @ 12" o/c $S_x = 21.39$ in^3 $F_b^* = 1273$ psi

$f_b = 2604(12)/21.39 = 1461$ psi > F_b^* NG

→ Try 2x12 @ 12" o/c $S_x = 31.64$ in^3 $F_b^* = 1.15(115)(1.0)(875) = 1157$ psi

$f_b = 2604(12)/31.64 = 988$ psi < 1157 OK

$\Delta_{TL} = -0.434" \approx L/442 < L/240$ OK (RISA 2D)

$\Delta_{LL} = -0.393 \approx L/488 < L/480$ OK (RISA 2D)

Use 2x12 @ 12" o/c

✓ Columns ⇒ $P_{max} = 300(180) = 54000$# ($P_{allow} = 54000$# OK) (LL = SINGLE ALL OF ATTIC NOT "LIVEABLE")

✓ Living Room Bm. ⇒ $w_R = (110 + 20)(15.5) = 2015$ #/'

$M_R = 2015(19)^2/8 = 90,927$ #'

M_R (w12x35) = 90 k-ft SAY OK (NO ATTIC LOAD ON WEST SIDE)

$\Delta_{LL} = \frac{100}{80}(0.40) = 0.55" \approx L/415 > L/480$ SAY OK

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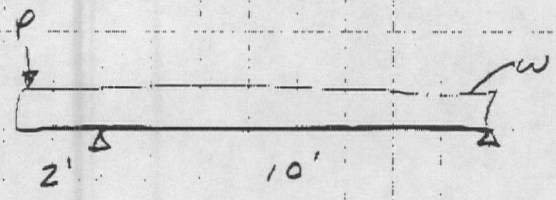
Subject: SHOVERS RES.

Project No. 2002104

Date: 1/12/03 By: MML Sheet: ____ of ____

JOISTS @ MASTER WARDROBE

TRY 14" TJI 250 @ 1'-4" o/c , L = 12'



$w_{LL} = 40 PSF \left(\frac{16}{12}\right) = 53.3 PLF$

$w_{DL} = 10 PSF \left(\frac{16}{12}\right) = 13.3 PLF$

$P_{ROOF} \Rightarrow (10+20)\left(\frac{18'}{2}\right)\left(\frac{14'}{2}\right) + (10+20)(17')(14') = 7350\#$