



**La Fleur Residence**

**624 S Humphrey Ave.  
Oak Park, IL**

**Interior Remodeling  
Structural Engineering Calculations**

The following pages of calculations, totaling 12 pages, have been prepared under my direct supervision.



**Kenneth M Floody P.E., S.E.  
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**Design Check Calculation Sheet**  
Sizer 2004a

**LOADS (lbs, psf, or pft) :**

Load	Type	Distribution	Magnitude		Location [ft]		Pat-tern
			Start	End	Start	End	
Load1	Dead	Full UDL	118.0				No
Load2	Live	Full UDL	175.0				No

**MAXIMUM REACTIONS (lbs) and BEARING LENGTHS (in) :**



Dead	762	762
Live	1072	1072
Total	1833	1833
Bearing:		
LC number	2	2
Length	1.00	1.00

**LVL n-ply, 2.0E, 2950Fb, 1-3/4x9-1/4", 2-Plys**

Self Weight of 9.33 pft automatically included in loads;  
Lateral support: top= at supports, bottom= at supports; Load combinations: ICC-IBC;

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	$F_v = 74$	$F_v' = 285$	$F_v/F_v' = 0.26$
Bending(+)	$F_b = 1350$	$F_b' = 2925$	$F_b/F_b' = 0.46$
Live Defl'n	$0.19 = L/765$	$0.41 = L/360$	0.47
Total Defl'n	$0.40 = L/370$	$0.61 = L/240$	0.65

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL	CV	Cfu	Cr	Cfrc	Ci	Cn	LC#
Fb'+	2950	1.00	-	1.00	0.957	1.04	-	1.00	1.00	-	-	2
Fv'	285	1.00	-	1.00	-	-	-	-	1.00	-	1.00	2
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	-
E'	2.0 million	-	-	1.00	-	-	-	-	1.00	-	-	2

Bending(+): LC# 2 = D+L, M = 5615 lbs-ft

Shear : LC# 2 = D+L, V = 1833, V design = 1603 lbs

Deflection: LC# 2 = D+L EI= 231e06 lb-in<sup>2</sup>/ply

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

{D=dead L=live S=snow W=wind I=impact C=construction CLd=concentrated}

{All LC's are listed in the Analysis output}

**DESIGN NOTES:**

- Please verify that the default deflection limits are appropriate for your application.
- SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- BUILT-UP SCL-BEAMS: contact manufacturer for connection details when loads are not applied equally to all plys.

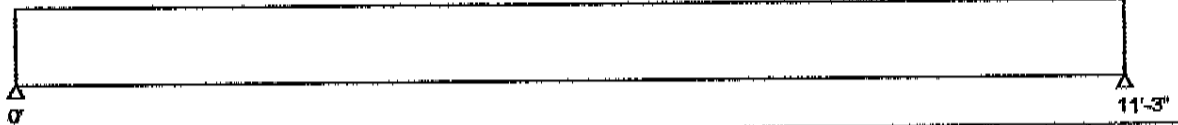


**Design Check Calculation Sheet**  
Sizer 2004a

**LOADS (lbs, psf, or plf) :**

Load	Type	Distribution	Magnitude		Location [Ft]		Pat-tern
			Start	End	Start	End	
Load1	Dead	Point	765		3.13		No
Load2	Dead	Point	765		8.13		No
Load3	Live	Point	1075		8.13		No
Load4	Live	Point	1075		3.13		No

**MAXIMUM REACTIONS (lbs) and BEARING LENGTHS (in) :**



Dead	817		817
Live	1075		1075
Total	1892		1892
Bearing:			
LC number	2		2
Length	1.00		1.00

**LVL n-ply, 2.0E, 2950Fb, 1-3/4x9-1/4", 2-Plys**

Self Weight of 9.33 plf automatically included in loads;  
Lateral support: top= at supports, bottom= at supports; Load combinations: ICC-IBC;

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	$F_v = 87$	$F_v' = 285$	$F_v/F_v' = 0.31$
Bending(+)	$F_b = 1411$	$F_b' = 2942$	$F_b/F_b' = 0.48$
Live Defl'n	$0.38 = L/756$	$0.38 = L/360$	0.48
Total Defl'n	$0.38 = L/355$	$0.56 = L/240$	0.68

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL	CV	Cfu	Cr	Cft	Ci	Cn	LC#
Fb'+	2950	1.00	-	1.00	0.963	1.04	-	1.00	1.00	-	-	2
Fv'	285	1.00	-	1.00	-	-	-	-	1.00	-	1.00	2
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	-
E'	2.0 million	-	-	1.00	-	-	-	-	1.00	-	-	2

Bending(+): LC# 2 = D+L, M = 5868 lbs-ft  
 Shear : LC# 2 = D+L, V = 1892, V design = 1885 lbs  
 Deflection: LC# 2 = D+L EI= 231e06 lb-in<sup>2</sup>/ply  
 Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.  
 (D=dead L=live S=snow W=wind I=impact C=construction CLd=concentrated)  
 (All LC's are listed in the Analysis output)

**DESIGN NOTES:**

- Please verify that the default deflection limits are appropriate for your application.
- SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- BUILT-UP SCL-BEAMS: contact manufacturer for connection details when loads are not applied equally to all plys.

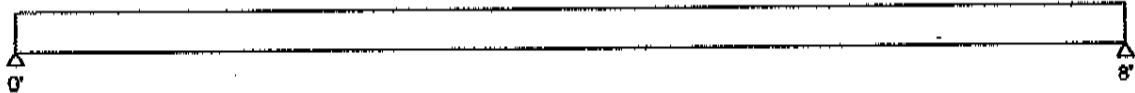


**Design Check Calculation Sheet**  
Sizer 2004a

**LOADS (lbs, psf, or plf) :**

Load	Type	Distribution	Magnitude		Location (ft)		Pat-tern
			Start	End	Start	End	
Load1	Dead	Axial	830	(Eccentricity = 0.00 in)			
Load2	Live	Axial	1075	(Eccentricity = 0.00 in)			

**MAXIMUM REACTIONS (lbs):**



**Lumber n-ply, S-P-F, No.1/No.2, 2x4", 2-Plys**

Self Weight of 2.12 plf automatically included in loads;

Pinned base; Loadface = width(b); Built-up fastener: nails;  $K_e \times L_b: 1.00 \times 0.00 = 0.00$  [ft];  $K_e \times L_d: 1.00 \times 8.00 = 8.00$  [ft]; Load combinations: ICC-IBC;

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Axial	$f_c = 183$	$F_c' = 499$	$f_c/F_c' = 0.37$
Axial Bearing	$f_c = 183$	$F_c^* = 1322$	$f_c/F_c^* = 0.14$

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL/CP	CF	Cfu	Cx	Cfvt	Ci	LC#
$F_c'$	1150	1.00	1.00	1.00	0.377	1.150	-	-	1.00	1.00	2
$F_c^*$	1150	1.00	1.00	1.00	-	1.150	-	-	1.00	1.00	2

Axial : LC# 2 = D+L, P = 1922 lbs Kf = 1.00

(D=dead L=live S=snow W=wind I=impact C=construction CL=concentrated)  
(All LC's are listed in the Analysis output)

**DESIGN NOTES:**

- Please verify that the default deflection limits are appropriate for your application.
- BUILT-UP COLUMNS: nailed or bolted built-up columns shall conform to the provisions of NDS Clause 15.3.

@ SILL PLATE:

$$f_{c1} = \frac{2000}{(2) 1.5 (3.5)} = 190 \text{ psi}$$

$F_{c1} = 425 \text{ psi}$  OK  
(SPF #2) NO BASE REQ'D



**Design Check Calculation Sheet**  
Sizer 2004a

**LOADS ( lbs, psf, or plf ) :**

Load	Type	Distribution	Magnitude		Location [ft]		Pat-tern
			Start	End	Start	End	
Load1	Dead	Point	765		5.25		No
Load2	Dead	Point	765		10.25		No
Load3	Live	Point	1075		10.25		No
Load4	Live	Point	1075		5.25		No
Load5	Live	Full Area	40.00 (0.67)*				No
Load6	Dead	Full Area	10.00 (0.67)*				No

\*Tributary Width (ft)

**MAXIMUM REACTIONS (lbs) and BEARING LENGTHS (in) :**



Dead	778	972
Live	1121	1395
Total	1899	2367
Bearing:		
LC number	2	2
Length	1.00	1.00

**LVL n-ply, 2.0E, 2950Fb, 1-3/4x9-1/4", 2-Plys**

Self Weight of 9.33 plf automatically included in loads;  
Lateral support: top= at supports, bottom= at supports; Load combinations: ICC-IBC;

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	$F_v = 108$	$F_v' = 285$	$F_v/F_v' = 0.38$
Bending(+)	$f_b = 2255$	$F_b' = 2896$	$f_b/F_b' = 0.78$
Live Defl'n	$0.40 = L/412$	$0.69 = L/240$	0.58
Total Defl'n	$0.82 = L/201$	$0.92 = L/180$	0.89

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL	CV	Cfu	Cr	Cfxt	Ci	Cn	LC#
Fb'+	2950	1.00	-	1.00	0.948	1.04	-	1.00	1.00	-	-	2
Fv'	285	1.00	-	1.00	-	-	-	-	1.00	-	1.00	2
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	-
E'	2.0 million	-	-	1.00	-	-	-	-	1.00	-	-	2

Bending(+): LC# 2 = D+L, M = 9381 lbs-ft  
Shear : LC# 2 = D+L, V = 2367, V design = 2335 lbs  
Deflection: LC# 2 = D+L EI= 231e06 lb-in<sup>2</sup>/ply  
Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.  
(D=dead L=live S=snow W=wind I=impact C=construction CL=concentrated)  
(All LC's are listed in the Analysis output)

**DESIGN NOTES:**

- Please verify that the default deflection limits are appropriate for your application.
- SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
- Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
- BUILT-UP SCL-BEAMS: contact manufacturer for connection details when loads are not applied equally to all plys.



DATE: 3/1/05

PREPARED BY: K M FLOODY

PROJECT NO.: 05-0136

REVIEWED BY:

SUBJECT: 024 S. Hampden

PAGE: 6 OF

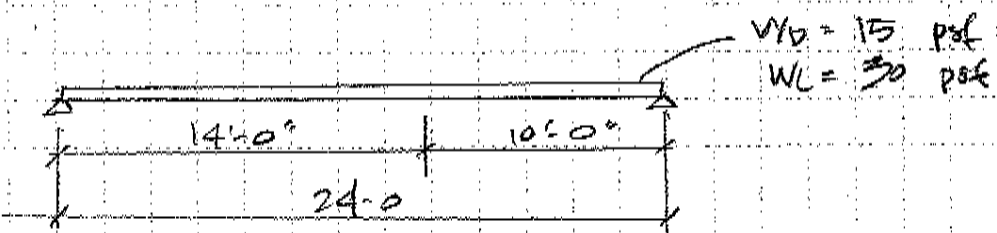
COLUMN P2 -  $P_A = 2370\#$

- USE STEEL SUPPORT POST
- 3"  $\phi$  STEEL POST,  $e_{lu} = 9'$ ,  $C_{kp} = 31,000\#$
- OR
- USE BASE PLATE  $3/8 \times 6 \times 6$  w/ (2)  $1/2"$  ANCHOR BOLTS

USE  $18" \times 18" \times 12"$  THICK UNREINFORCED FOOTING  
 $g = 1.07$  ksf - OK BY JUDGEMENT

REMOVE BEARING WALL IN KITCHEN & REPLACE WITH LVL BEAM  
 $L = 12'-3"$  - JOIST SUPPORT SHIFTED  $1'-9"$  NORTH

- CHECK EXISTING 2x6 - CONTINUOUS OVER SUPPORT  
(FIELD VERIFY)



2x6 FAILS - (BENDING & DEFLECTION)

SISTER PARTIAL LENGTH 2x6 TO EXISTING -  
SEE MOMENT DIAGRAM

H4 -  $L = 12'-2 1/2'$  USE (3)  $1 3/4 \times 9 1/4$  LVL

P4 - 3"  $\phi$  STEEL POST OR BY COMP TO P2 - ( $P_A = 1500\#$ )

USE  $18" \times 18" \times 12"$  THICK UNREINFORCED FOOTING  
 $g = 2.0$  ksf OK BASED ON EXPERIENCE

FOOTING REFERENCE

P2

PIER OR BASE PLATE ("T")

CONCRETE PROPERTIES

$\phi = 0.55$   
 $f'_c = 3000$  (PSI)

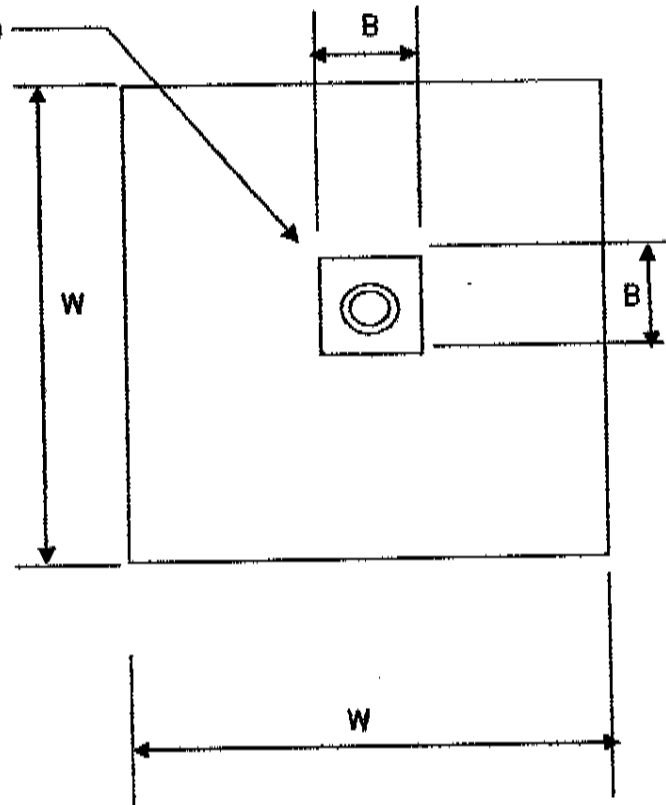
COLUMN PROPERTIES

BASE PLATE (BxB)                    6    IN  
COLUMN SIZE                         3    IN  
RADIUS OF LOADED AREA (D)       3    IN  
AVG. RADIUS OF COLUMN (R)       1.64 IN

 $f_p = 0.0849$  KSI $F_p = 1.05$  KSIBASE PLATE $F_y = 36$  KSICOLUMN LOADING

<u>COLUMN LOADING</u>	(KIPS)
DEAD LOAD	1.00
FLOOR LIVE LOAD	1.40
ROOF LIVE LOAD	0.00
SNOW LOAD	0.00
<b>TOTAL</b>	<b>2.40</b>

(BASED ON GOVERNING COMBINATION PER IBC 2003)

PLATE CHECK

Q (KSI)	0.07	OK
T REQUIRED	1/8	

FOOTING SIZE (WxW) (FT)	1.5
FOOTING THICKNESS (IN)	12
FACTORED PRESSURE (KSF)	1.53
BEARING PRESSURE (KSF)	1.07

$M_u$ (IN-K)	3.4	
S (IN <sup>3</sup> )	243	
$\phi M_N$ (IN-K)	36.6	OK
ONE WAY SHEAR $\phi V_N$ (K)	6.5	OK
TWO WAY SHEAR $\phi V_N$ (K)	43.3	OK


**UNREINFORCED FOOTING ANALYSIS**

**Design Check Calculation Sheet**  
 Sizer 2004a

**LOADS (lbs, psf, or plf) :**

Load	Type	Distribution	Magnitude		Location [ft]		Pat-tern
			Start	End	Start	End	
Load1	Dead	Full Area	15.00	(16.0)*			No
Load2	Live	Full Area	30.00	(16.0)*			Yes

\*Tributary width (in)

**MAXIMUM REACTIONS (lbs) and BEARING LENGTHS (in) :**


Dead	121		332		66
Live	239		613		179
Total	360		945		245
Bearing:					
LC number	3		2		4
Length	1.00		1.11		1.00
Cb	1.00		1.34		1.00

**Lumber-soft, S-P-F, No.1/No.2, 2x6"**

Spaced at 16" c/c; Self Weight of 1.67 plf automatically included in loads;

Lateral support: top= full, bottom= at supports; Repetitive factor: applied where permitted (refer to online help); Load combinations: ICC-IBC;

**WARNING:** Member length exceeds typical stock length of 18.0 [ft]

**This section FAILS the design check**
**WARNING:** This section violates the following design criteria: Bending and deflection

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	$f_v = 89$	$F_v' = 135$	$f_v/F_v' = 0.66$
Bending(+)	$f_b = 1672$	$F_b' = 1308$	$f_b/F_b' = 1.28$
Bending(-)	$f_b = 1576$	$F_b' = 1003$	$f_b/F_b' = 1.57$
Live Defl'n	$0.77 = L/217$	$0.47 = L/360$	1.65
Total Defl'n	$1.27 = L/131$	$0.70 = L/240$	1.82

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL	CF	Cfu	Cr	Cf <sub>rt</sub>	Ci	Cn	LC#
F <sub>b</sub> ' <sup>+</sup>	875	1.00	1.00	1.00	1.000	1.300	1.00	1.15	1.00	1.00	-	3
F <sub>b</sub> ' <sup>-</sup>	875	1.00	1.00	1.00	0.766	1.300	1.00	1.15	1.00	1.00	-	3
F <sub>v</sub> '	135	1.00	1.00	1.00	-	-	-	-	1.00	1.00	1.00	2
F <sub>cp</sub> '	425	-	1.00	1.00	-	-	-	-	1.00	1.00	-	-
E'	1.4 million	1.00	1.00	1.00	-	-	-	-	1.00	1.00	-	3

 Bending(+): LC# 3 = D+L (pattern: L<sub>-</sub>), M = 1054 lbs-ft

 Bending(-): LC# 3 = D+L (pattern: L<sub>-</sub>), M = 993 lbs-ft

Shear : LC# 2 = D+L, V = 517, V design = 489 lbs

 Deflection: LC# 3 = D+L (pattern: L<sub>-</sub>) EI = 29e06 lb-in<sup>2</sup>

Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.

(D=dead L=live S=snow W=wind I=impact C=construction C/d=concentrated)

(All LC's are listed in the Analysis output)

(Load Pattern: s=S/2, X=L+S or L+C, \_=no pattern load in this span)

**DESIGN NOTES:**

- Please verify that the default deflection limits are appropriate for your application.
- Continuous or Cantilevered Beams: NDS Clause 4.2.5.5 requires that normal grading provisions be extended to the middle 2/3 of 2 span beams and to the full length of cantilevers and other spans.
- Sawn lumber bending members shall be laterally supported according to the provisions of NDS Clause 4.4.1.

$$M_{cap}^+ = 823 \text{ #}$$

$$M_{cap}^- = 832 \text{ #}$$

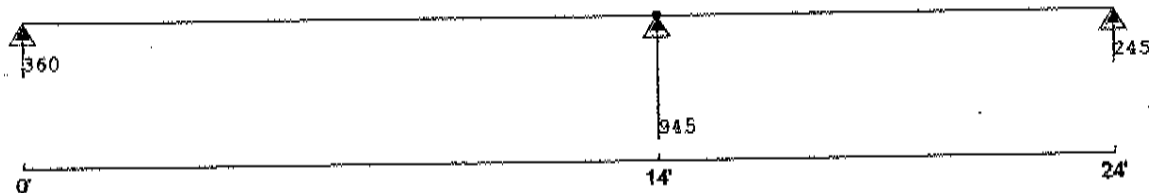
Joist.wbg  
Critical Results

WoodWorks® Sizer 2004a

Mar. 4, 2005 19:51:23

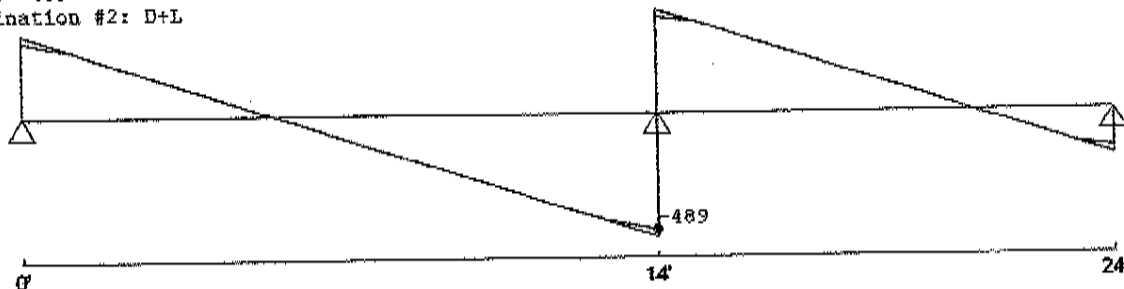
REACTION [lbs]

Maximum...  
Uplift: 0  
Bearing: 945



SHEAR [lbs]

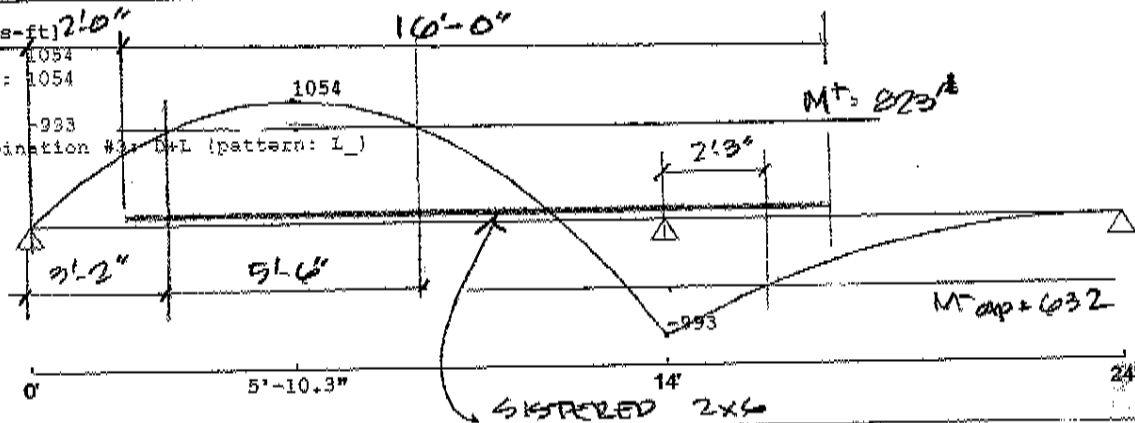
+V max: 428  
-V max: -517  
V design: -489  
Load Combination #2: D+L



Design shear < maximum due to notching or loads ignored within distance "d" of support.

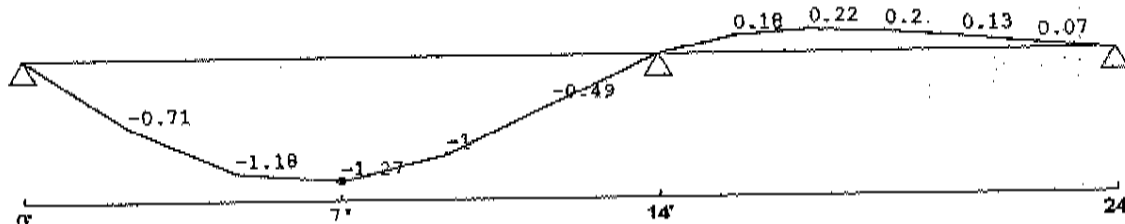
BENDING [lbs-ft]

+M max: 1054  
+M design: 1054  
-M max: -993  
Load Combination #3: D+L (pattern: L)



DEFLECTION [in]

Max Live: 0.77  
Max Total: 1.27  
Load Combination #3: D+L (pattern: L)



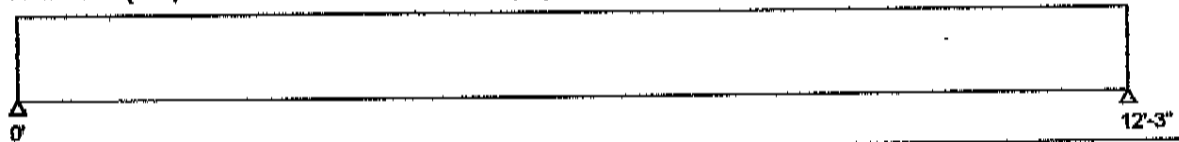


**Design Check Calculation Sheet**  
Sizer 2004a

**LOADS (lbs, psf, or plf) :**

Load	Type	Distribution	Magnitude		Location [ft]		Pat-tern
			Start	End	Start	End	
Load1	Dead	Full UDL	250.0				No
Load2	Live	Full UDL	460.0				No

**MAXIMUM REACTIONS (lbs) and BEARING LENGTHS (in) :**



Dead	1601		1601
Live	2817		2817
Total	4418		4418
Bearing:			
LC number	2		2
Length	1.68		1.68

**LVL n-ply, 2.0E, 2950Fb, 1-3/4x11-1/4", 2-Plys**

Self Weight of 11.35 plf automatically included in loads;  
Lateral support: top= at supports, bottom= at supports; Load combinations: ICC-IBC;

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Shear	$f_v = 143$	$F_v' = 285$	$f_v/F_v' = 0.50$
Bending(+)	$f_b = 2199$	$F_b' = 2792$	$f_b/F_b' = 0.79$
Live Defl'n	$0.28 = L/523$	$0.41 = L/360$	0.69
Total Defl'n	$0.52 = L/282$	$0.61 = L/240$	0.85

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL	CV	Cfu	Cr	Cft	Ci	Cn	LC#
Fb'+	2950	1.00	-	1.00	0.938	1.01	-	1.00	1.00	-	-	2
Fv'	285	1.00	-	1.00	-	-	-	-	1.00	-	1.00	2
Fcp'	750	-	-	1.00	-	-	-	-	1.00	-	-	-
E'	2.0 million	-	-	1.00	-	-	-	-	1.00	-	-	2

Bending(+): LC# 2 = D+L, M = 13531 lbs-ft  
 Shear : LC# 2 = D+L, V = 4418, V design = 3742 lbs  
 Deflection: LC# 2 = D+L EI= 415e06 lb-in<sup>2</sup>/ply  
 Total Deflection = 1.50(Dead Load Deflection) + Live Load Deflection.  
 (D=dead L=live S=snow W=wind I=impact C=construction CLd=concentrated)  
 (All LC's are listed in the Analysis output)

**DESIGN NOTES:**

1. Please verify that the default deflection limits are appropriate for your application.
2. SCL-BEAMS (Structural Composite Lumber): the attached SCL selection is for preliminary design only. For final member design contact your local SCL manufacturer.
3. Size factors vary from one manufacturer to another for SCL materials. They can be changed in the database editor.
4. BUILT-UP SCL-BEAMS: contact manufacturer for connection details when loads are not applied equally to all plys.

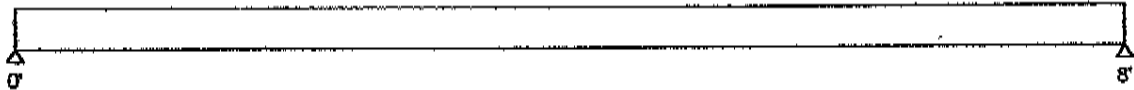


**Design Check Calculation Sheet**  
Sizer 2004a

**LOADS ( lbs, psf, or plf ) :**

Load	Type	Distribution	Magnitude		Location [ft]		Pat-tern
			Start	End	Start	End	
Load1	Dead	Axial	1650	(Eccentricity = 0.00 in)			
Load2	Live	Axial	2650	(Eccentricity = 0.00 in)			

**MAXIMUM REACTIONS (lbs):**



**Lumber n-ply, S-P-F, No.1/No.2, 2x4", 2-Plys**

Self Weight of 2.12 plf automatically included in loads;

Pinned base; Loadface = width(b); Built-up fastener: nails;  $K_e \times L_b: 1.00 \times 0.00 = 0.00$  [ft];  $K_e \times L_d: 1.00 \times 8.00 = 8.00$  [ft]; Load combinations: ICC-IBC;

**Analysis vs. Allowable Stress (psi) and Deflection (in) using NDS 2001 :**

Criterion	Analysis Value	Design Value	Analysis/Design
Axial	$f_c = 430$	$F_c^* = 499$	$f_c/F_c^* = 0.86$
Axial Bearing	$f_c = 430$	$F_c^* = 1322$	$f_c/F_c^* = 0.33$

— use (3) 2x4

**ADDITIONAL DATA:**

FACTORS:	F	CD	CM	Ct	CL/CP	CF	Cfu	Cr	Gfct	Ci	LC#
$F_c^*$	1150	1.00	1.00	1.00	0.377	1.150	-	-	1.00	1.00	2
$F_c^*$	1150	1.00	1.00	1.00	-	1.150	-	-	1.00	1.00	2

Axial : LC# 2 = D+L, P = 4517 lbs Kf = 1.00

(D=dead L=live S=snow W=wind I=impact C=construction CLd=concentrated)

(All LC's are listed in the Analysis output)

**DESIGN NOTES:**

- Please verify that the default deflection limits are appropriate for your application.
- BUILT-UP COLUMNS: nailed or bolted built-up columns shall conform to the provisions of NDS Clause 15.3.

$$f_{c1} = \frac{4500}{3(1.5)(3.5)} = 286 \text{ psi} < 425 \text{ psi}$$

— EXISTING 6x6 TIMBER IS OLD —  
USE SIMPSON PC04-L0 BASE

FOOTING REFERENCE

P4

PIER OR BASE PLATE ("T")

CONCRETE PROPERTIES

$\phi = 0.55$   
 $f'_c = 3000$  (PSI)

COLUMN PROPERTIES

BASE PLATE (BxB) 6 IN  
 COLUMN SIZE 3  
 RADIUS OF LOADED AREA (D) 3 IN  
 AVG. RADIUS OF COLUMN (R) 1.64 IN

$f_p = 0.1592$  KSI  
 $F_p = 1.05$  KSI

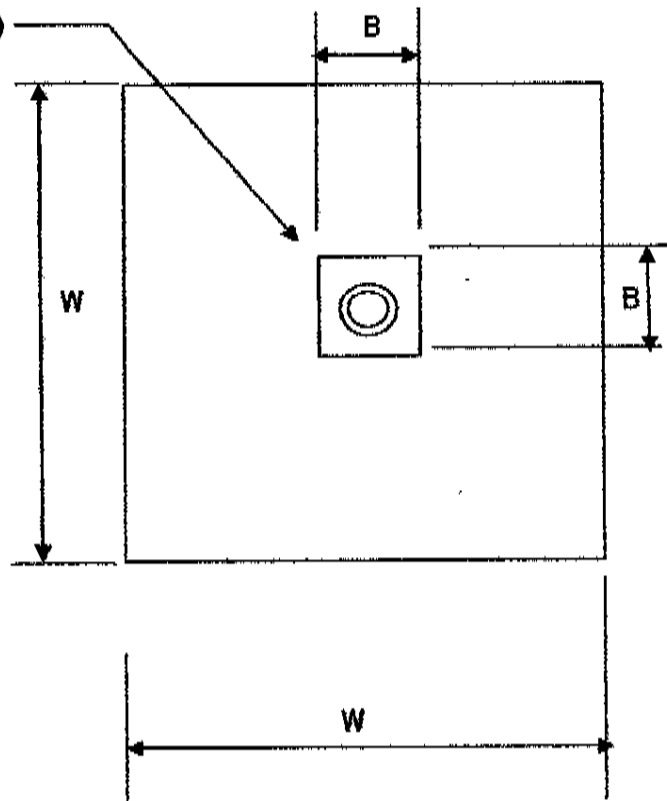
BASE PLATE

$F_y = 36$  KSI

COLUMN LOADING

(KIPS)  
 DEAD LOAD 1.65  
 FLOOR LIVE LOAD 2.85  
 ROOF LIVE LOAD 0.00  
 SNOW LOAD 0.00  
 TOTAL 4.50

(BASED ON GOVERNING COMBINATION PER IBC 2003)

PLATE CHECK

Q (KSI) 0.13 OK  
 T REQUIRED 1/8

FOOTING SIZE (WxW) (FT) 1.5  
 FOOTING THICKNESS (IN) 12  
 FACTORED PRESSURE (KSF) 2.91  
 BEARING PRESSURE (KSF) 2.00

$M_u$  (IN-K) 6.5  
 $S$  (IN<sup>3</sup>) 243  
 $\phi M_N$  (IN-K) 36.6 OK  
 ONE WAY SHEAR  $\phi V_N$  (K) 6.5 OK  
 TWO WAY SHEAR  $\phi V_N$  (K) 43.3 OK

## UNREINFORCED FOOTING ANALYSIS