May 29, 2020

Don Julian Builders

Re: 2924 NW Audubon Ln
Lot 1450 Winterset Valley
Lee's Summit, MO

Apex Engineers Inc. observed the house under construction at the above referenced address. For the purposes of this report the house will be referred to as facing south. Our firm has been retained to address the following items from the rough-in framing inspection:

1. *Rafters bearing on multiple top plates on wall at east side of single car garage.*

- The existing rafters, top plates and ceiling joists shall be fastened as shown in detail **2/SX-1**, attached to this report for reference. This detail is also shown on **11/S3.1** on the original plans.

2. *Missing (6)-2x4 studs below (3)-2x10 in wall between entry and garage.*

- Install a built-up wood column consisting of a minimum of (3)-2x6 studs, in lieu of the (6)-2x4 stud pack shown on the original plans.
- Each 2x6 ply shall be fastened with 1 row of 10d common nails (0.128''x3') at 9" on-center alternating side to side, 1.4" min edge distance, and starting 2.5" from each end.
- See detail **1/S3.1** for clarity for fastening of built-up wood column plies.
- The existing (3) #2-2x10 beam spanning over the garage may be fastened into the broad side of the (3)-2x6 built-up wood column with a Simpson LUS210-3 face-mount joist hanger. Fasten hanger into the column/blocking with (8) 16d common nails (0.162''X3 ½'') and fasten the hanger into the joist with (6) 16d common nails (0.162''X3 ½'').

This report does not constitute approval by the enforcing jurisdiction. Please call if our firm can of further assistance.

LIMITATIONS

The scope of our services includes only those items specifically addressed herein. All other items are outside the scope of this inspection; including any environmental assessment (such as, but not limited to mold, mildew, or presence of any other toxic substance or environmental risks).

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

Best Regards,
Apex Engineers, Inc.

Joshua Jensen, P.E.
Project Engineer

Clayton J. Hess, P.E.
Principal

STATE OF MISSOURI
CLAYTON J. HESS
NUMBER
PE-2003000003
2020.06.01
PROFESSIONAL ENGINEER

SD SMOKE DETECTOR
CM CARBON MONOXIDE DETECTOR

BRACED WALL METHODOLOGY
CONTINUOUS EXTERIOR SHEATHING PER WSP METHOD (BELOW)
UNLESS OTHERWISE NOTED ON THE PLAN

XXXX EXTERIOR BRACED WALLS:

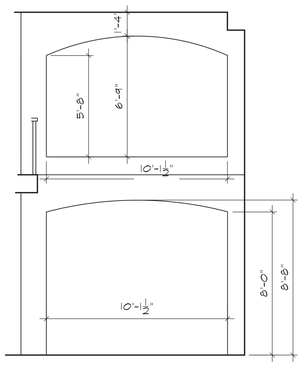
WSP METHOD: WOOD STRUCTURAL PANEL SHEATHING WITH A THICKNESS NOT LESS THAN 7/16" WITH MINIMUM SPAN RATING OF 24/0 FOR 16" OC STUD SPACING WITH 6d COMMON NAILS AT 6" OC EDGES AND 12" OC FIELD OR SHEATHING THICKNESS NOT LESS THAN 7/16" WITH MINIMUM SPAN RATING OF 7/16 FOR 24" OC SPACING WITH 8d COMMON NAILS AT 6" OC EDGES AND 12" OC IN FIELD.
(NOTE: FRAMING MEMBERS 16" OC MAX,UNBLOCKED, AND WITH SHEATHING APPLIED DIRECTLY TO FRAMING MEMBERS)

//// INTERIOR BRACED WALLS (REF 2-S4.0):

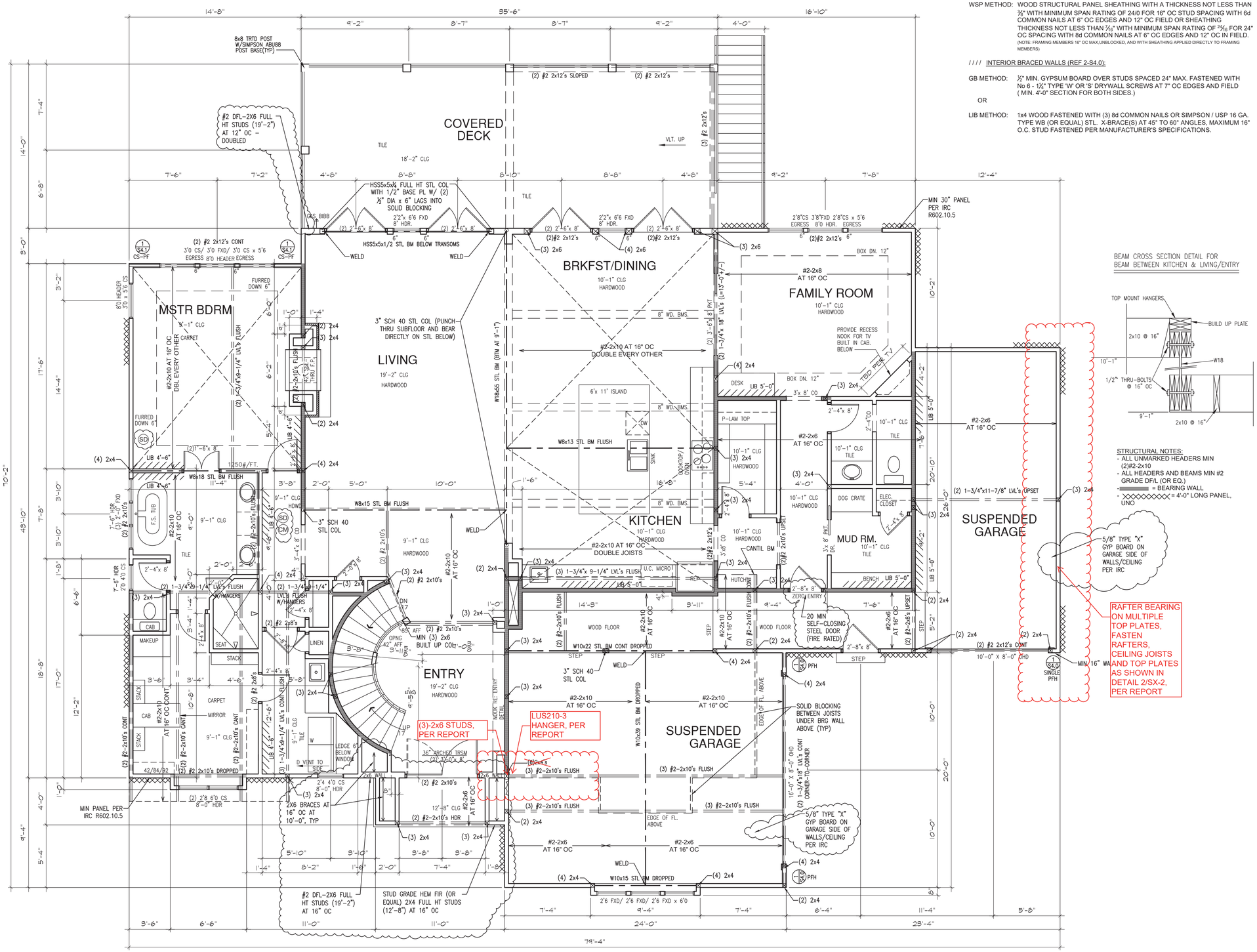
GB METHOD: ½" MIN. GYPSUM BOARD OVER STUDS SPACED 24" MAX. FASTENED WITH No 6 - 1½" TYPE 'W' OR 'S' DRYWALL SCREWS AT 7" OC EDGES AND FIELD (MIN. 4'-0" SECTION FOR BOTH SIDES.)

OR

LIB METHOD: 1x4 WOOD FASTENED WITH (3) 8d COMMON NAILS OR SIMPSON / USP 16 GA. TYPE WB (OR EQUAL) STL. X-BRACE(S) AT 45° TO 60° ANGLES, MAXIMUM 16" O.C. STUD FASTENED PER MANUFACTURER'S SPECIFICATIONS.



ENTRY DETAIL



FIRST FLOOR PLAN
SCALE: 1/4"= 1'-0" 2,552 SQ FT

BEAM CROSS SECTION DETAIL FOR BEAM BETWEEN KITCHEN & LIVING/ENTRY

STRUCTURAL NOTES:
- ALL UNMARKED HEADERS MIN (2)#2-2x10
- ALL HEADERS AND BEAMS MIN #2 GRADE DF/L (OR EQ.)
- ▬▬ = BEARING WALL
- XXXXXXXX = 4'-0" LONG PANEL, UNO

SQUARE FOOTAGE:
Living Area - 1ST Flr: 2552
Living Area - 2ND Flr: 21822
Un-Finished basements: 1997
Finished basements: 1313
Deck: 490
Garage: 720

DON JULIAN BUILDERS, INC.
Custom Homes Since 1974

15521 West 110th Street
Lenexa, Kansas 66219
(913) 894-6300
(913) 894-6321 fax

REVISION DATE

LINDSTROM RESIDENCE - MADISON II
LOT 1450 WINTERSET VALLEY

2924 NW AUDOBON LANE
LEE'S SUMMIT, MISSOURI 64081

PROJECT #
18032

DRAWING NAME
18032F1

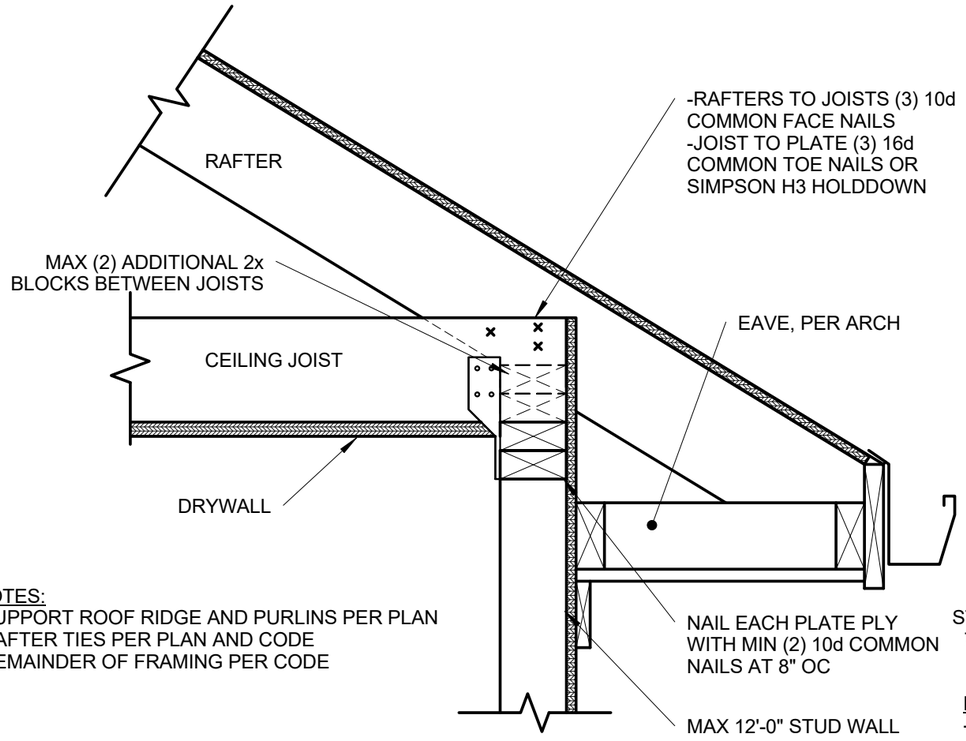
DATE
8-20-19

DRAWN BY
RRF

CHECKED BY
042616

SHEET #
2

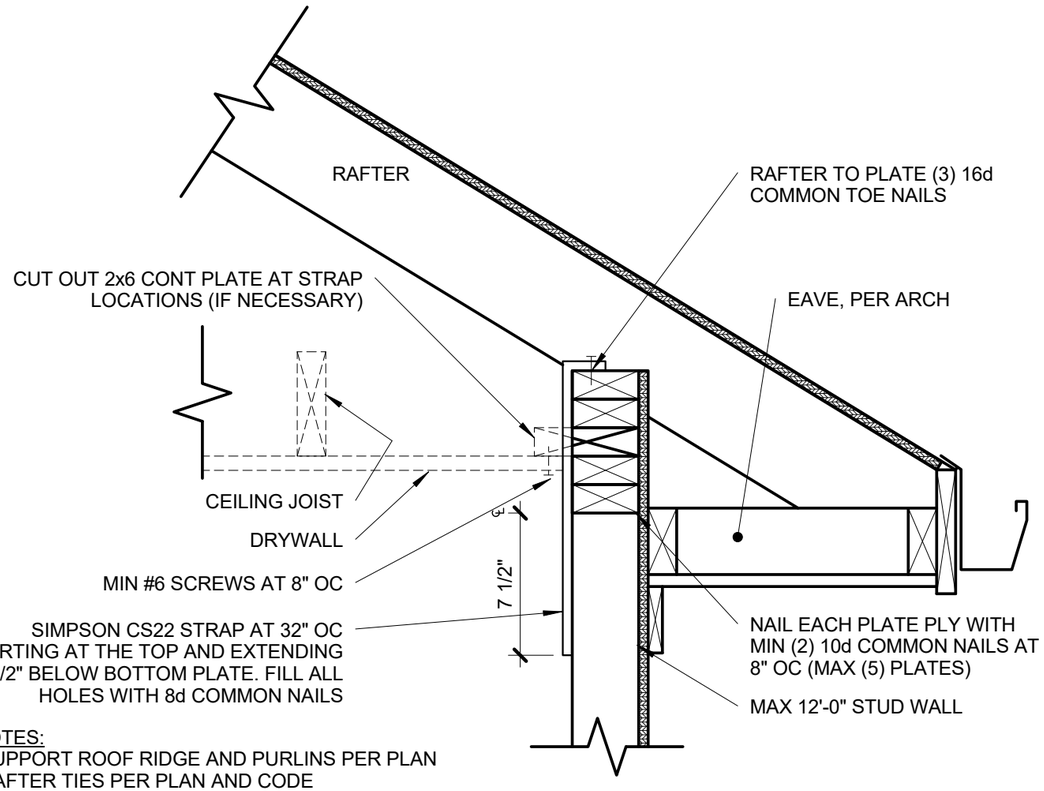
THIS IS AN ENGINEERED ROOF STRUCTURE DESIGNED FOR COMPLIANCE WITH IRC 802.3, BUILD AS SHOWN WITH NO DEVIATIONS



NOTES:
-SUPPORT ROOF RIDGE AND PURLINS PER PLAN
-RAFTER TIES PER PLAN AND CODE
-REMAINDER OF FRAMING PER CODE

2 OPTIONAL RAFTER BEARING

SX-1 | 1 1/2" = 1'-0"



NOTES:
-SUPPORT ROOF RIDGE AND PURLINS PER PLAN
-RAFTER TIES PER PLAN AND CODE
-REMAINDER OF FRAMING PER CODE

1 OPTIONAL RAFTER BEARING

SX-1 | 1 1/2" = 1'-0"

APEX ENGINEERS, INC.
1625 LOCUST ST
KANSAS CITY, MISSOURI
816.421.3222
www.apex-engineers.com

STATE OF MISSOURI
CLAYTON J. HESS
NUMBER PE-2003000003
2020.06.01
PROFESSIONAL ENGINEER

PROJECT: XXX
CLIENT: X

PROJECT #:	31634
DRAWN BY:	APEX
CHECKED BY:	APEX

SHEET #: SX-1

APEX
ENGINEERS, INC.
1625 LOCUST ST
KANSAS CITY, MO 64108
816.421.3222
www.apex-engineers.com

STATE OF MISSOURI
CLAYTON J. [illegible]
NUMBER
PE-2003000003
2020.06.01
PROFESSIONAL ENGINEER

STRUCTURAL DESIGN REVIEW

KANSAS ENGINEERING LICENSE:
E-992
MISSOURI ENGINEERING LICENSE:
2003004673

PROJECT:
2924 NW Audubon Ln
Lot 1450 Winterset Valley
Lee's Summit, MO

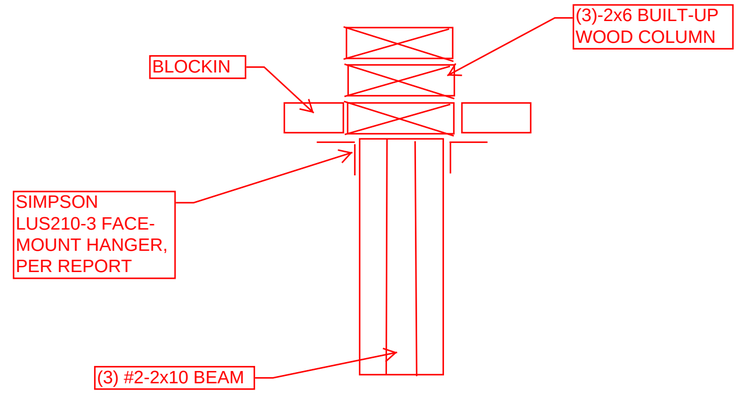
CLIENT:
Don Julian Builders

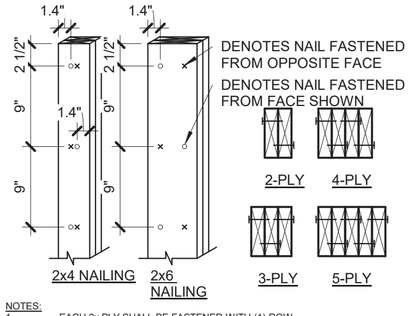
PROJECT #:	XXXXX
DRAWN BY:	XXX
CHECKED BY:	BDC
SUBMITTAL DATE:	2018.01.08

#	DATE	COMMENTS

SHEET:
FRAMING DETAILS
S3.1

TOP VIEW OF BUILT-UP WOOD COLUMN





NOTES:
1. EACH 2x PLY SHALL BE FASTENED WITH (1) ROW OF 10d NAILS AT 9" OC, ALTERNATING SIDE TO SIDE
2. 1.4" MIN EDGE DISTANCE, AND STARTING 2 1/2" FROM EACH END.
3. EXTEND FULL AREA OF COLUMN AS SOLID BLOCKING THROUGH JOIST BAYS AND WALLS TO LOAD-BERAING BEAM/WALL BELOW

1 BUILT-UP STUD COLUMN
S3.1 1" = 1'-0"

Apex Engineers, Inc
1625 Locust
Kansas City, MO 64108
www.apex-engineers.com

Project Title: 2924 NW Audubon Ln
Engineer:
Project ID:
Project Descr:

Printed: 29 MAY 2020, 12:42PM

Wood Column

Lic. # : KW-06005244 — APEX ENGINEERS INC

DESCRIPTION: Column Calc

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-10

General Information

Analysis Method : Allowable Stress Design
End Fixities : Top & Bottom Pinned
Overall Column Height : 10 ft
(Used for non-slender calculations)

Wood Species : Douglas Fir - Larch
Wood Grade : Stud

Fb +	700.0 psi	Fv	180.0 psi
Fb -	700.0 psi	Ft	450.0 psi
Fc - Prll	850.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1,400.0	1,400.0	1,400.0 ksi
Minimum	510.0	510.0	

Wood Section Name: **3-2x6**
Wood Grading/Manuf.: Graded Lumber
Wood Member Type: Sawn

Exact Width	**4.50**	in
Exact Depth	**5.50**	in
Area	24.750	in^2
Ix	62.391	in^4
Iy	41.766	in^4

Allow Stress Modification Factors

Cf or Cv for Bending	1.0
Cf or Cv for Compression	1.0
Cf or Cv for Tension	1.0
Cm : Wet Use Factor	1.0
Ct : Temperature Factor	1.0
Cfu : Flat Use Factor	1.0
Kf : Built-up columns	0.60 *NDS 15.3.2*
Use Cr : Repetitive ?	No

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 10 ft, K = 1.0
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 10 ft, K = 1.0

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 53.642 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 10.0 ft, Xecc = 2.250 in, D = 1.50 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.3736** : 1
Load Combination +D+H
Governing NDS Forumla Comp + Myy, NDS Eq. 3.9-3
Location of max.above base 9.933 ft
At maximum location values are . . .
Applied Axial 1.554 k
Applied Mx 0.0 k-ft
Applied My -0.2794 k-ft
Fc : Allowable 273.286 psi

PASS Maximum Shear Stress Ratio = **0.01052** : 1
Load Combination +D+H
Location of max.above base 10.0 ft
Applied Design Shear 1.705 psi
Allowable Shear 162.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.02813 k	Bottom along X-X	0.02813 k

Maximum SERVICE Load Lateral Deflections . . .
Along Y-Y 0.0 in at 0.0 ft above base
for load combination : n/a
Along X-X -0.05378 in at 5.839 ft above base
for load combination : +D+H

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Max Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Max Shear Ratios: Stress Ratio	Status	Location
+D+H	0.900	0.357	0.3736	PASS	9.933 ft	0.01052	PASS	10.0 ft
+D+L+H	1.000	0.333	0.3379	PASS	9.933 ft	0.009470	PASS	10.0 ft
+D+Lr+H	1.250	0.283	0.2747	PASS	9.933 ft	0.007576	PASS	10.0 ft
+D+S+H	1.150	0.301	0.2966	PASS	9.933 ft	0.008235	PASS	10.0 ft
+D+0.750Lr+0.750L+H	1.250	0.283	0.2747	PASS	9.933 ft	0.007576	PASS	10.0 ft
+D+0.750L+0.750S+H	1.150	0.301	0.2966	PASS	9.933 ft	0.008235	PASS	10.0 ft
+D+0.60W+H	1.600	0.231	0.2203	PASS	9.933 ft	0.005919	PASS	10.0 ft
+D+0.70E+H	1.600	0.231	0.2203	PASS	9.933 ft	0.005919	PASS	10.0 ft
+D+0.750Lr+0.750L+0.450W+H	1.600	0.231	0.2203	PASS	9.933 ft	0.005919	PASS	10.0 ft
+D+0.750L+0.750S+0.450W+H	1.600	0.231	0.2203	PASS	9.933 ft	0.005919	PASS	10.0 ft
+D+0.750L+0.750S+0.5250E+H	1.600	0.231	0.2203	PASS	9.933 ft	0.005919	PASS	10.0 ft
+0.60D+0.60W+0.60H	1.600	0.231	0.1198	PASS	0.0 ft	0.003551	PASS	10.0 ft

Apex Engineers, Inc
1625 Locust
Kansas City, MO 64108
www.apex-engineers.com

Project Title: 2924 NW Audubon Ln
Engineer:
Project ID:
Project Descr:

Printed: 29 MAY 2020, 12:42PM

Wood Column

019\2924 NW Audubon Lane_Lot 1450 Winterset Valley_LSMO\2020.05.29_Struct_Don Julian\beam calcs.ec6 .

Lic. # : KW-06005244 — APEX ENGINEERS INC

DESCRIPTION: Column Calc

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+0.60D+0.70E+0.60H	1.600	0.231	0.1198	PASS	0.0 ft	0.003551	PASS	10.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	@ Top	k-ft	Mx - End Moments @ Base	@ Top
+D+H	-0.028	0.028				1.554					
+D+L+H	-0.028	0.028				1.554					
+D+Lr+H	-0.028	0.028				1.554					
+D+S+H	-0.028	0.028				1.554					
+D+0.750Lr+0.750L+H	-0.028	0.028				1.554					
+D+0.750L+0.750S+H	-0.028	0.028				1.554					
+D+0.60W+H	-0.028	0.028				1.554					
+D+0.70E+H	-0.028	0.028				1.554					
+D+0.750Lr+0.750L+0.450W+H	-0.028	0.028				1.554					
+D+0.750L+0.750S+0.450W+H	-0.028	0.028				1.554					
+D+0.750L+0.750S+0.5250E+H	-0.028	0.028				1.554					
+0.60D+0.60W+0.60H	-0.017	0.017				0.932					
+0.60D+0.70E+0.60H	-0.017	0.017				0.932					
D Only	-0.028	0.028				1.554					
Lr Only											
L Only											
S Only											
W Only											
E Only											
H Only											

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
+D+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+L+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+Lr+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+S+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.60W+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.70E+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.450W+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.5250E+H	-0.0538 in	5.839 ft	0.000 in	0.000 ft
+0.60D+0.60W+0.60H	-0.0323 in	5.839 ft	0.000 in	0.000 ft
+0.60D+0.70E+0.60H	-0.0323 in	5.839 ft	0.000 in	0.000 ft
D Only	-0.0538 in	5.839 ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
E Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
H Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

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Kansas City, MO 64108
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STATE OF MISSOURI
CLAYTON J. HESS
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PROFESSIONAL ENGINEER

Project Title: 2924 NW Audubon Ln
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Printed: 29 MAY 2020, 12:42PM

Wood Column

Lic. # : KW-06005244 APEX ENGINEERS INC

DESCRIPTION: Column Calc

Sketches