



HD Engineering & Design

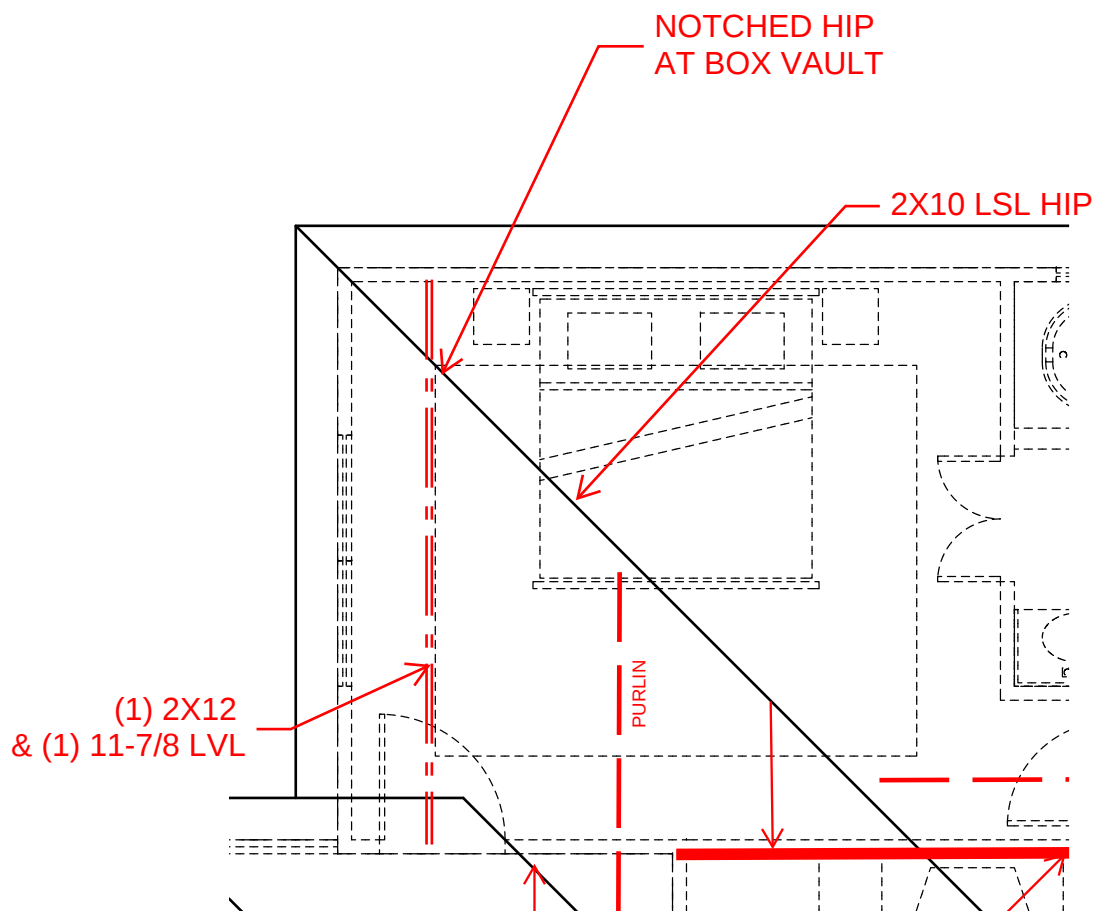
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FRAMING ADDENDUM

3-1-22

SAB HOMES

Re: RIVIERA ELEV. B (MO139)
4724 NE JAMESTOWN DR.
LEE'S SUMMIT, MO



***BOX BEAM MEMBER IS ADEQUATE TO
TRANSFER HIP LOAD TO EXTERIOR WALL
(SEE ATTACHED CALC)**



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STRUCTURAL REVIEW
HD ENGINEERING & DESIGN
HD: 41190 DATE: 3/1/22

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Wood Beam

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 HD ENGINEERING & DESIGN

DESCRIPTION: BOX VAULT BEAM CHECK

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : IBC 2018

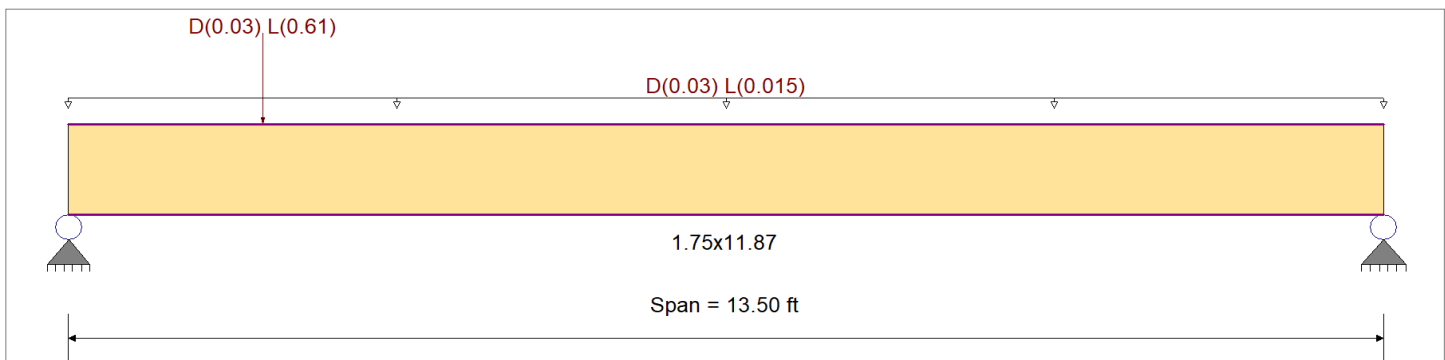
Material Properties

Analysis Method : Allowable Stress Design
 Load Combination IBC 2018

Wood Species : iLevel Truss Joist
 Wood Grade : MicroLam LVL 1.9 E

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb + 2600 psi E : Modulus of Elasticity
 Fb - 2600 psi Ebend- xx 1900 ksi
 Fc - Prll 2510 psi Eminbend - xx 965.71 ksi
 Fc - Perp 750 psi
 Fv 285 psi
 Ft 1555 psi Density 42.01pcf



Applied Loads

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

Beam self weight calculated and added to loads

Uniform Load : D = 0.010, L = 0.0050 ksf, Tributary Width = 3.0 ft, (CLG)

Point Load : D = 0.030, L = 0.610 k @ 2.0 ft, (HIP LOAD)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.250	1	Maximum Shear Stress Ratio	=	0.213	1
Section used for this span		1.75x11.87		Section used for this span		1.75x11.87	
fb: Actual	=	551.81	psi	fv: Actual	=	60.60	psi
Fb: Allowable	=	2,210.00	psi	Fv: Allowable	=	285.00	psi
Load Combination		+D+L		Load Combination		+D+L	
Location of maximum on span	=	4.878	ft	Location of maximum on span	=	0.000	ft
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.084	in	Ratio =		1926	>=360
Max Upward Transient Deflection		0.000	in	Ratio =		0	<360
Max Downward Total Deflection		0.151	in	Ratio =		1069	>=180
Max Upward Total Deflection		0.000	in	Ratio =		0	<180

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00	
Length = 13.451 ft	1		0.125	0.066	0.90	1.000	1.00	1.00	0.85	1.00	1.00	0.85	248.53	1989.00	0.23	16.85	256.50
Length = 0.04927 ft	1		0.002	0.066	0.90	1.000	1.00	1.00	0.85	1.00	1.00	0.01	3.55	1989.00	0.21	16.85	256.50
+D+L						1.000	1.00	1.00	0.85	1.00	1.00		0.00	0.00	0.00	0.00	
Length = 13.451 ft	1		0.250	0.213	1.00	1.000	1.00	1.00	0.85	1.00	1.00	1.89	551.81	2210.00	0.84	60.60	285.00
Length = 0.04927 ft	1		0.003	0.213	1.00	1.000	1.00	1.00	0.85	1.00	1.00	0.02	6.30	2210.00	0.39	60.60	285.00
+D+0.750L						1.000	1.00	1.00	0.85	1.00	1.00		0.00	0.00	0.00	0.00	
Length = 13.451 ft	1		0.171	0.139	1.25	1.000	1.00	1.00	0.85	1.00	1.00	1.62	472.79	2762.50	0.69	49.66	356.25
Length = 0.04927 ft	1		0.002	0.139	1.25	1.000	1.00	1.00	0.85	1.00	1.00	0.02	5.61	2762.50	0.34	49.66	356.25
+0.60D						1.000	1.00	1.00	0.85	1.00	1.00		0.00	0.00	0.00	0.00	
Length = 13.451 ft	1		0.042	0.022	1.60	1.000	1.00	1.00	0.85	1.00	1.00	0.51	149.12	3536.00	0.14	10.11	456.00
Length = 0.04927 ft	1		0.001	0.022	1.60	1.000	1.00	1.00	0.85	1.00	1.00	0.01	2.13	3536.00	0.13	10.11	456.00

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DESCRIPTION: BOX VAULT BEAM CHECK

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1514	6.405		0.0000	0.000

Maximum Deflections for Load Combinations

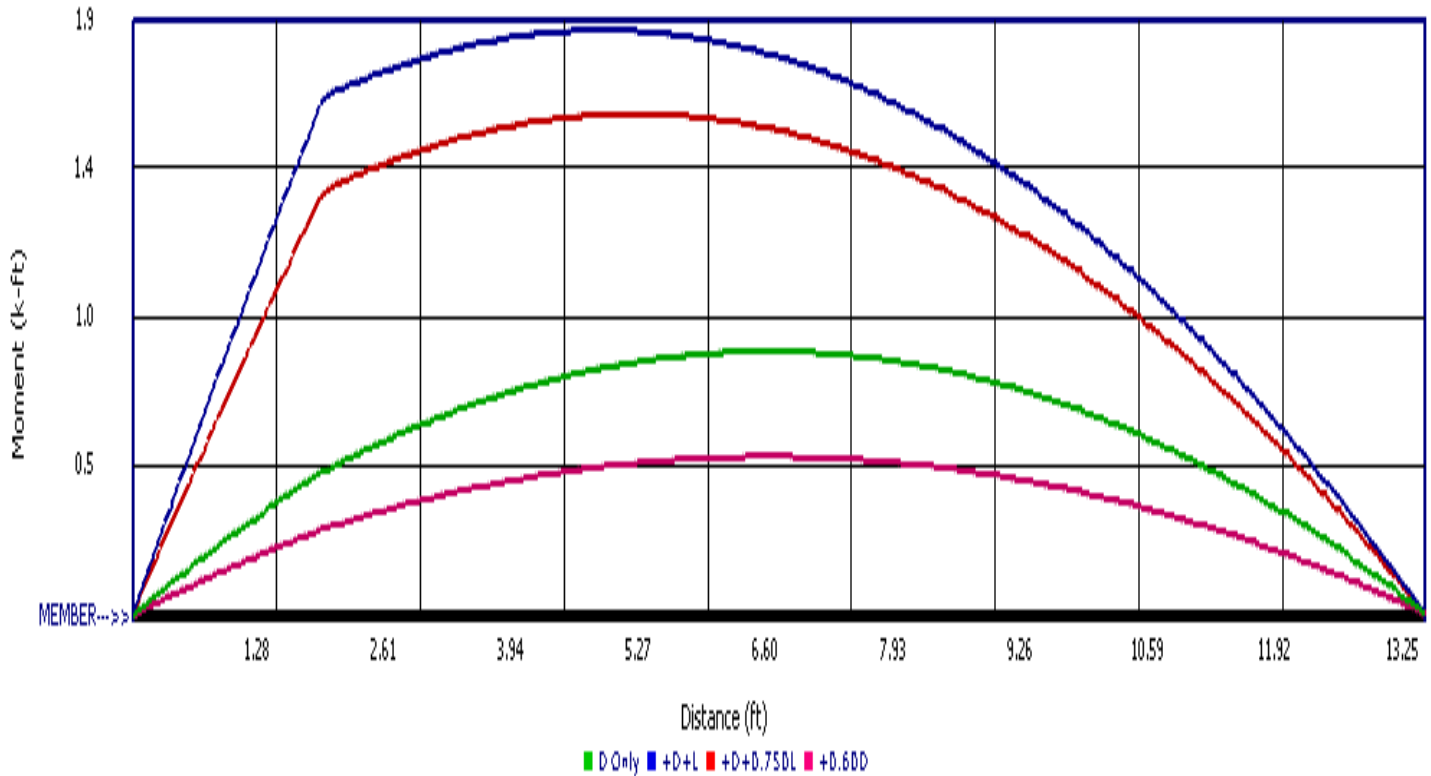
Load Combination	Span	Max. Downward Defl	Location in Span	Max. Upward Defl	Location in Span
D Only	1	0.0677 in	6.750 ft	0.0000 in	0.000 ft
+D+L	1	0.1514 in	6.405 ft	0.0000 in	0.000 ft
+D+0.750L	1	0.1305 in	6.454 ft	0.0000 in	0.000 ft
+0.60D	1	0.0406 in	6.750 ft	0.0000 in	0.000 ft
L Only	1	0.0841 in	6.159 ft	0.0000 in	0.000 ft

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.890	0.439
Overall MINimum	0.621	0.192
D Only	0.269	0.248
+D+L	0.890	0.439
+D+0.750L	0.735	0.392
+0.60D	0.161	0.149
L Only	0.621	0.192



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