

HD Engineering & Design

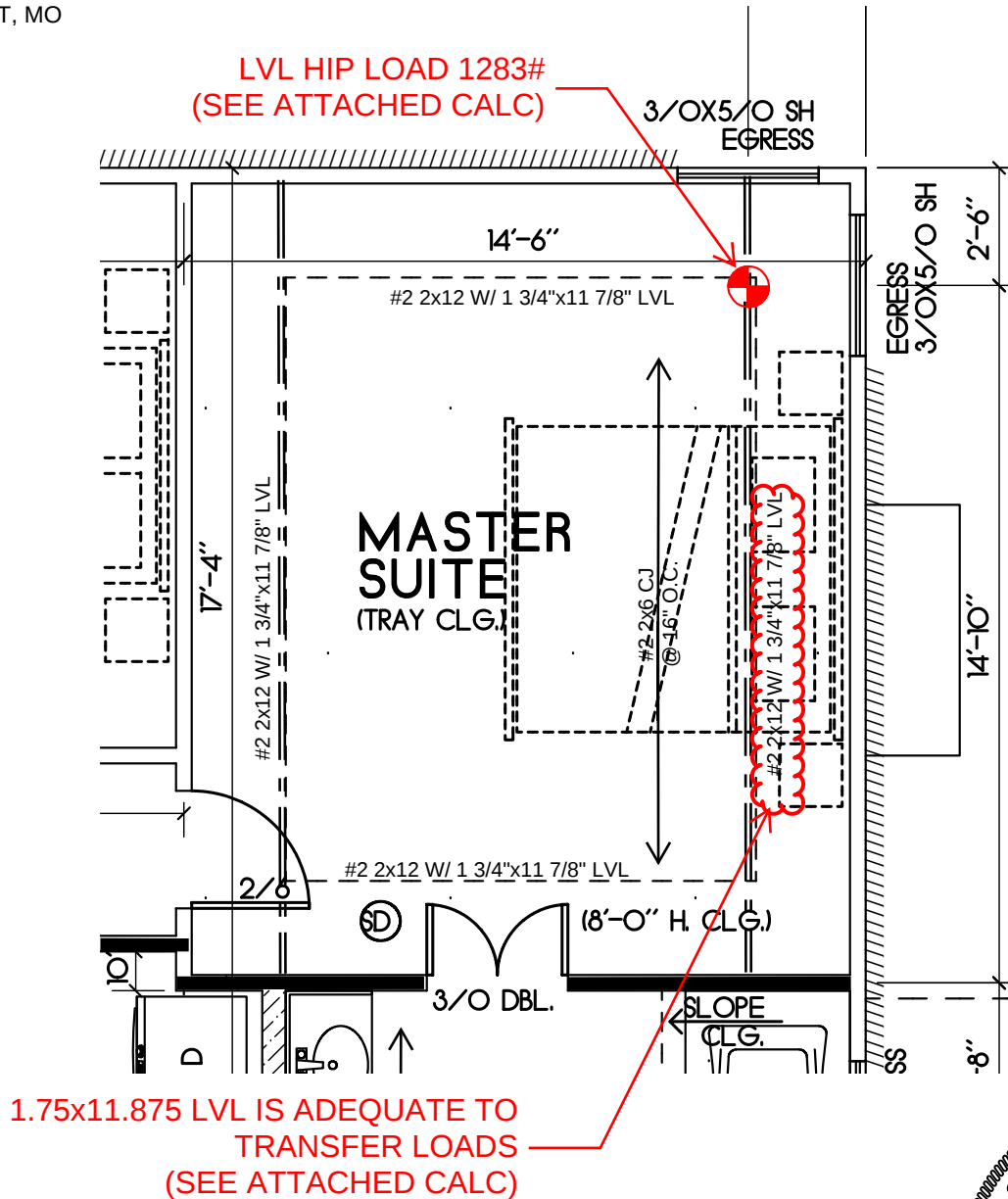
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FRAMING ADDENDUM

4/19/2022

SAB HOMES

RE: REDBUD PLAN (HF02)
2034 SW FARM FIELD LANE
LEE'S SUMMIT, MO



Wood Beam

LIC#: KW-06015579, Build:20.22.3.31

HD Engineering & Design

Project: 2008001885

DESCRIPTION: MASTER BED HIP

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

Load Combination Set : ASCE 7-05

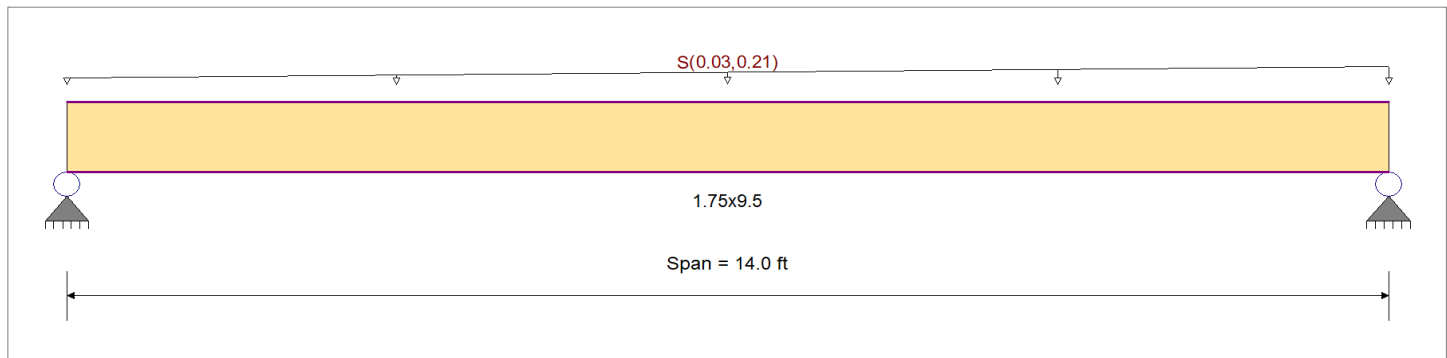
Material Properties

Analysis Method : Allowable Stress Design
Load Combination : ASCE 7-05

Wood Species : LouisianaPacific
Wood Grade : SolidStartLVL2650Fb-1.9E

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

Fb + 2,650.0 psi
Fb - 2,650.0 psi
Fc - Prll 2,350.0 psi
Fc - Perp 750.0 psi
Fv 285.0 psi
Ft 1,600.0 psi
E : Modulus of Elasticity
Eband- xx 1,900.0ksi
Eminband - xx 980.0ksi
Density 28.720pcf



Applied Loads

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

Beam self weight calculated and added to loading

Load for Span Number 1

Uniform Load : D = 0.010, L = 0.020, S = 0.020 ksf, Extent = 0.0 --> 14.0 ft, Tributary Width = 1.50->10.50 ft, (ROOF LOAD)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.905	1	Maximum Shear Stress Ratio	=	0.497	1
Section used for this span		1.75x9.5		Section used for this span		1.75x9.5	
fb: Actual	=	2,757.72psi		fv: Actual	=	162.98 psi	
Fb: Allowable	=	3,047.50psi		Fv: Allowable	=	327.75 psi	
Load Combination		+D+0.750L+0.750S		Load Combination		+D+0.750L+0.750S	
Location of maximum on span	=	7.818ft		Location of maximum on span	=	13.234 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	

Maximum Deflection

Max Downward Transient Deflection	0.439 in	Ratio =	382	>=240	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0	<240	n/a
Max Downward Total Deflection	0.891 in	Ratio =	188	>=180	Span: 1 : +D+0.750L+0.750S
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

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	
Length = 14.0 ft	1		0.301	0.164	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.57	716.83	2385.00	0.47	42.14	256.50
+D+L						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	
Length = 14.0 ft	1		0.784	0.431	1.00	1.000	1.00	1.00	1.00	1.00	1.00	4.56	2,077.42	2650.00	1.36	122.70	285.00
+D+S						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	
Length = 14.0 ft	1		0.682	0.374	1.15	1.000	1.00	1.00	1.00	1.00	1.00	4.56	2,077.42	3047.50	1.36	122.70	327.75
+D+0.750L						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	
Length = 14.0 ft	1		0.524	0.288	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.81	1,737.27	3312.50	1.14	102.56	356.25
+D+0.750L+0.750S						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	
Length = 14.0 ft	1		0.905	0.497	1.15	1.000	1.00	1.00	1.00	1.00	1.00	6.05	2,757.72	3047.50	1.81	162.98	327.75
+0.60D						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	
Length = 14.0 ft	1		0.101	0.055	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.94	430.10	4240.00	0.28	25.29	456.00

Wood Beam

Project File: beams and girders.ec6

LIC# : KW-06015579, Build:20.22.3.31

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DESCRIPTION: MASTER BED HIP

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.8911	7.204		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.283	2.123
Overall MINimum	0.630	1.050
D Only	0.338	0.548
+D+L	0.968	1.598
+D+S	0.968	1.598
+D+0.750L	0.811	1.336
+D+0.750L+0.750S	1.283	2.123
+0.60D	0.203	0.329
L Only	0.630	1.050
S Only	0.630	1.050

Wood Beam

LIC# : KW-06015579, Build:20.22.3.31

HD Engineering & Design

Project: 200800186506

**DESCRIPTION: MASTER VAULT SIDE MEMBER**

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16

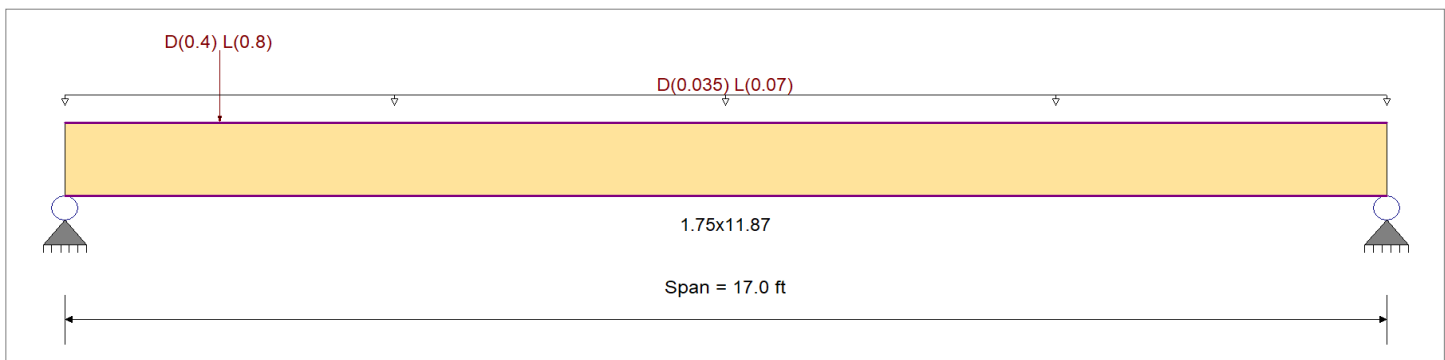
Load Combination Set : IBC 2018

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2018Wood Species : LouisianaPacific
Wood Grade : SolidStartLVL2650Fb-1.9E

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

Fb +	2,650.0 psi	E : Modulus of Elasticity	
Fb -	2,650.0 psi	Ebend- xx	1,900.0 ksi
Fc - Prll	2,350.0 psi	Eminbend - xx	980.0 ksi
Fc - Perp	750.0 psi		
Fv	285.0 psi		
Ft	1,600.0 psi	Density	28.720 pcf



Applied Loads

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

Beam self weight calculated and added to loading

Point Load : D = 0.40, L = 0.80 k @ 2.0 ft, (HIP LOAD)

Uniform Load : D = 0.0050, L = 0.010 ksf, Tributary Width = 7.0 ft, (CLG LOAD)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.576 1	Maximum Shear Stress Ratio	=	0.477 : 1
Section used for this span		1.75x11.87	Section used for this span		1.75x11.87
fb: Actual	=	1,527.12psi	fv: Actual	=	136.06 psi
Fb: Allowable	=	2,650.00psi	Fv: Allowable	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	7.197ft	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	0.392 in	Ratio =	519 >=360	Span: 1 : L Only	
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a	
Max Downward Total Deflection	0.605 in	Ratio =	337 >=180	Span: 1 : +D+L	
Max Upward Total Deflection	0 in	Ratio =	0 <180	n/a	

Maximum Forces & Stresses for Load Combinations

Load Combination		Span #	Max Stress Ratios									Moment Values			Shear Values		
Segment Length			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 = 17.0 ft	1	0.225	0.183	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.84	537.53	2385.00	0.65	46.86	256.50	
+D+L					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 17.0 ft	1	0.576	0.477	1.00	1.000	1.00	1.00	1.00	1.00	1.00	5.23	1,527.12	2650.00	1.88	136.06	285.00	
+D+0.750L					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 17.0 ft	1	0.386	0.319	1.25	1.000	1.00	1.00	1.00	1.00	1.00	4.39	1,279.71	3312.50	1.58	113.76	356.25	
+0.60D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	
Length = 17.0 ft	1	0.076	0.062	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.11	322.52	4240.00	0.39	28.12	456.00	

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.6053	8.190		0.0000	0.000

Wood Beam

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DESCRIPTION: MASTER VAULT SIDE MEMBER

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.987	1.069
Overall MINimum	1.301	0.689
D Only	0.686	0.380
+D+L	1.987	1.069
+D+0.750L	1.661	0.897
+0.60D	0.411	0.228
L Only	1.301	0.689