January 6, 2022

Viewpoint Residential Design, LLC
Attn: Jeff Pfeifer

Re: 501 NE Wenoga Pl., Lee's Summit, MO

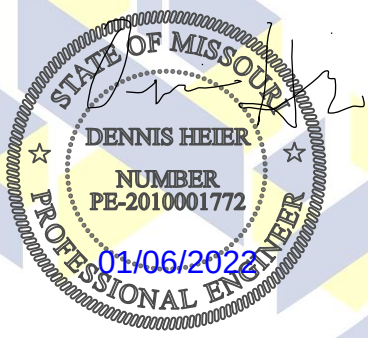
Vista Structural Engineering, LLC, was asked to address the beam requirement needed to supplement (2) undersized existing beams. We recommend the installation of (1) 1.75" x 16" Microllam LVL beam to span alongside the existing (2) 1.75" x 16" LVL beams, per the calculations on page 2 of this report. In addition, the LVL should be installed with (1) 2x4 DF-L#2 full height support post, as shown on page 3 of this report.

Our firm appreciates the opportunity to serve you. If you have any questions or if you need anything further, please feel free to contact us.

Sincerely,

Vista Structural Engineering, LLC

Dennis Heier, P.E.



Wood Beam

File: RHF053 Spec (2812 Hearthstone, Walker Custom Homes, LLC).ec6

Lic. # : KW-06010523 — Vista Structural Engineering, LLC

DESCRIPTION: Supplement Beam - 16" LVL

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design
Load Combination ASCE 7-16

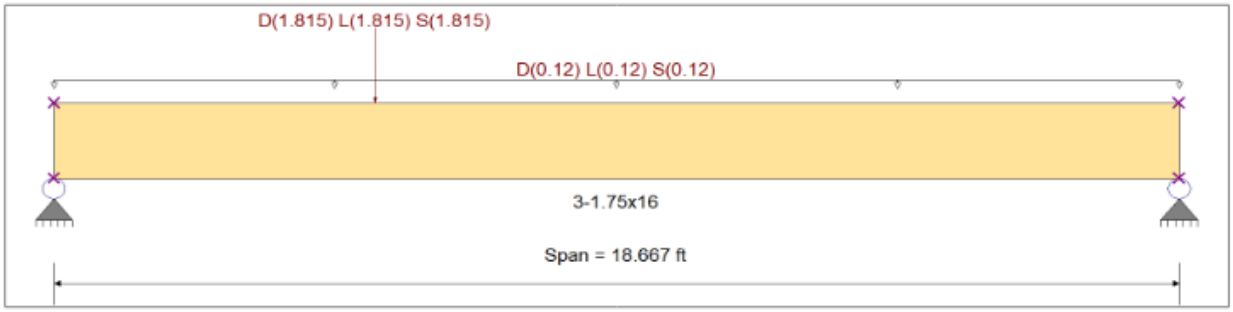
Wood Species : iLevel Truss Joist
Wood Grade : MicroLam LVL 1.9 E

Beam Bracing : Completely Unbraced

Fb +	2,600.0 psi
Fb -	2,600.0 psi
Fc - Prll	2,510.0 psi
Fc - Perp	750.0 psi
Fv	285.0 psi
Ft	1,555.0 psi

E : Modulus of Elasticity

Ebend- xx	1,900.0 ksi
Eminbend - xx	965.71 ksi
Density	42.010 pcf



Applied Loads

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

Uniform Load : D = 0.020, L = 0.020, S = 0.020 ksf, Tributary Width = 6.0 ft, (Roof & Ceiling Load East)
Point Load : D = 1.815, L = 1.815, S = 1.815 k @ 5.333 ft, (Ridge Support Beam End Reaction)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.554 : 1	Maximum Shear Stress Ratio	=	0.308 : 1
Section used for this span		3-1.75x16	Section used for this span		3-1.75x16
fb: Actual	=	1,497.14 psi	fv: Actual	=	100.94 psi
Fb: Allowable	=	2,703.58 psi	Fv: Allowable	=	327.75 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	5.382 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

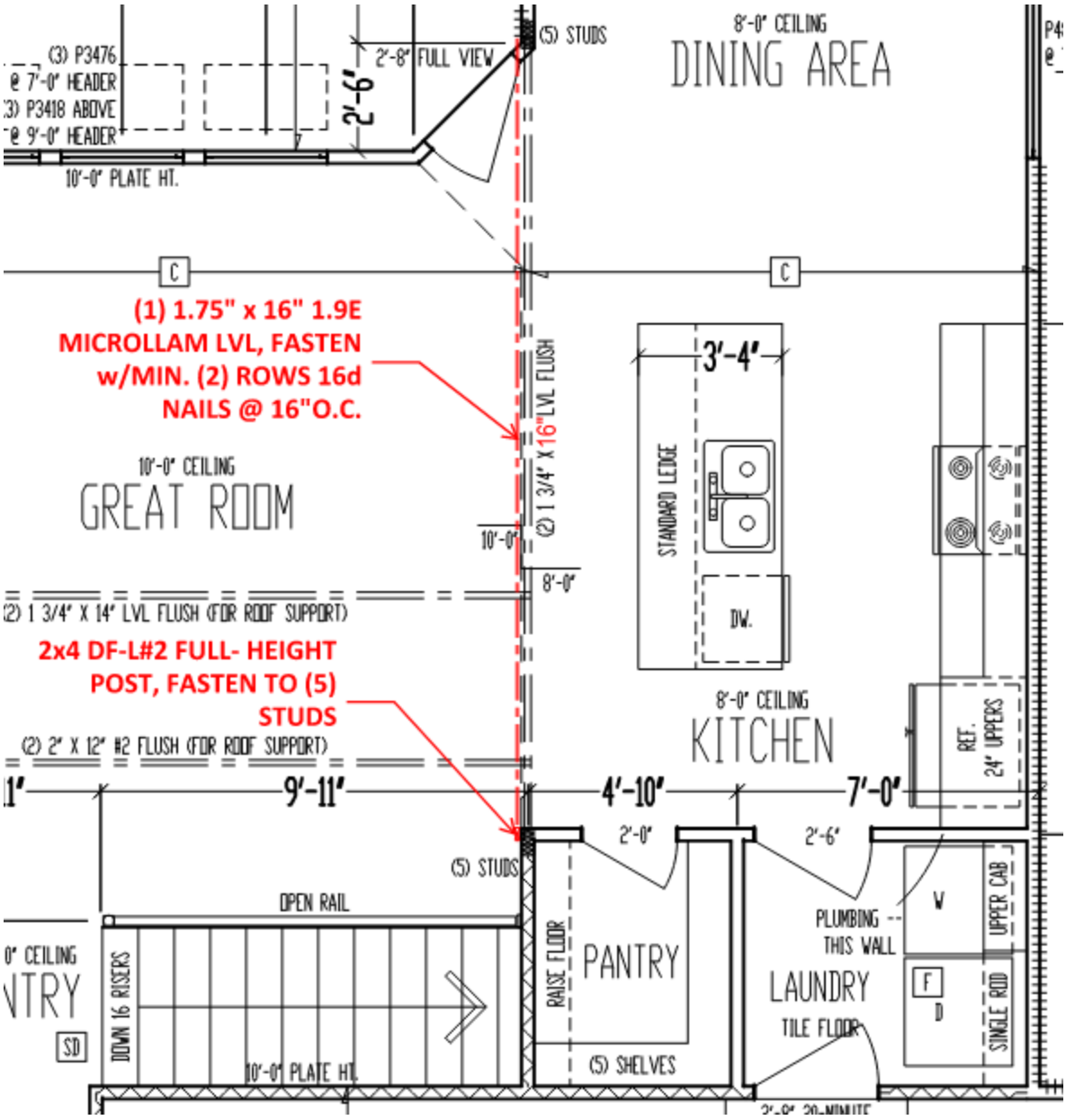
Max Downward Transient Deflection	0.193 in	Ratio =	1157 >=480
Max Upward Transient Deflection	0.000 in	Ratio =	0 <480
Max Downward Total Deflection	0.484 in	Ratio =	463 >=360
Max Upward Total Deflection	0.000 in	Ratio =	0 <360

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	C_d	C_{FV}	C_i	C_r	C_m	C_t	C_L	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+L													0.00	0.00	0.00	0.00
Length = 18.667 ft	1	0.502	0.283	1.00	0.962	1.00	1.00	1.00	1.00	0.95	22.36	1,197.71	2384.14	4.52	80.76	285.00
+D+S					0.962	1.00	1.00	1.00	1.00	0.95			0.00	0.00	0.00	0.00
Length = 18.667 ft	1	0.443	0.246	1.15	0.962	1.00	1.00	1.00	1.00	0.94	22.36	1,197.71	2703.58	4.52	80.76	327.75
+D+0.750L+0.750S					0.962	1.00	1.00	1.00	1.00	0.94			0.00	0.00	0.00	0.00
Length = 18.667 ft	1	0.554	0.308	1.15	0.962	1.00	1.00	1.00	1.00	0.94	27.95	1,497.14	2703.58	5.65	100.94	327.75

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.4837	8.857		0.0000	0.000


(3) P3476
@ 7'-0" HEADER
(3) P3418 ABOVE
@ 9'-0" HEADER
10'-0" PLATE HT.
2'-8" FULL VIEW
2'-6"
(5) STUDS
8'-0" CEILING
DINING AREA
(1) 1.75" x 16" 1.9E
MICROLLAM LVL, FASTEN
w/MIN. (2) ROWS 16d
NAILS @ 16"O.C.
(2) 1 3/4" X 16" LVL FLUSH
10'-0" CEILING
GREAT ROOM
10'-0"
8'-0"
(2) 1 3/4" X 14" LVL FLUSH (FOR ROOF SUPPORT)
2x4 DF-L#2 FULL- HEIGHT
POST, FASTEN TO (5)
STUDS
(2) 2" X 12" #2 FLUSH (FOR ROOF SUPPORT)
3'-4"
STANDARD LEDGE
DW.
8'-0" CEILING
KITCHEN
REF.
24" UPPERS
9'-11"
4'-10"
7'-0"
2'-0"
2'-6"
(5) STUDS
OPEN RAIL
RAISE FLOOR
PANTRY
(5) SHELVES
PLUMBING
THIS WALL
LAUNDRY
TILE FLOOR
W
F
D
UPPER CAB
SINGLE ROD
DOWN 16 RISERS
10'-0" PLATE HT.
SD