

August 26, 2021

Bellah Homes Attn: Paul Miller 1272 SW Arborcrest Circle Lee's Summit, MO

Re: 3207 SW Pergola Park Drive (Lot 109, New Longview)

Vista Structural Engineering, LLC, was asked to address one item called out during the city's rough-in inspection. It was requested that our firm either approve the existing construction, or if the existing construction is inadequate, provide a cost-effective remediation. The item called out by the city is below, in bold lettering, followed by our responses.

1) Please assess the rafters supporting the furred down box vault ceiling, as shown in the pictures on the following pages. Per the attached calculations, which include the added weight of the furreddown ceiling, we have determined that the maximum distance that the rafters can span, from the inside of the exterior wall to the purlin, is 12'-6". Given that the purlin supporting these rafters is installed within this distance, we recommend approval of the rafters that are supporting the furreddown ceiling. A partial roof plan illustrating this maximum distance can be found on the following page.

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.



VISTA STRUCTURAL ENGINEERING, LLC

14718 NW DELIA STREET PORTLAND, OREGON 97229 PHONE: 971.645.0901 VISTASTRUCTURAL.COM

3207 SW PERGOLA PARK DR. LOT 109, NEW LONGVIEW PARTIAL ROOF PLAN







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Vista Structural Engineering, LLC 14718 NW Delia Street Portland, OR 97229 (971) 233-6099 dennis@vistastructural.com

Wood Beam Lic. # : KW-06010523

File: NLV109 (Viewpoint).ec6 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.24 Vista Structural Engineering, LLC

DESCRIPTION: Lot 109, New Longview - rafters supporting furred down box vault (max span = 12'-0" from inside face of ext. wall to purlin)

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10 Load Combination Set : IBC 2018

Material Properties

Analysis Method : Allowable Stress Design	Fb +	900.0 psi	E : Modulus of Elasti	icity
Load Combination IBC 2018	Fb -	900.0 psi	Ebend- xx	1,600.0 ksi
	Fc - Prll	1,350.0 psi	Eminbend - xx	580.0ksi
Wood Species Douglas Fir-Larch	Fc - Perp	625.0 psi		
Wood Grade : No 2	Fv .	180.0 psi		
	Ft	575.0 psi	Density	31.210 pcf
Beam Bracing : Beam is Fully Braced against lateral-tors	ional buckling	1	Repetitive Membe	er Stress Increase



Applied Loads

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

0.0000

0.000

Loads on all spans...

+D+S

Uniform Load on ALL spans : D = 0.0170, S = 0.020 ksf, Tributary Width = 1.333 ft

DESIGN SUMMARY

DESIGN SUMMARY					Design OK
Maximum Bending Stress Ratio Section used for this span	=	0.988 1 Ma 2x6	ximum Shear Stress Ratio Section used for this span	=	0.251:1 2x6
fb: Actual	=	1,528.54psi	fv: Actual	=	51.96 psi
Fb: Allowable	=	1,547.33psi	Fv: Allowable	=	207.00 psi
Load Combination Location of maximum on span Span # where maximum occurs	= =	+D+S 6.250ft Span # 1	Load Combination Location of maximum on span Span # where maximum occurs	= =	+D+S 12.044 ft Span # 1
Maximum Deflection Max Downward Transient Defle Max Upward Transient Deflection Max Downward Total Deflection Max Upward Total Deflection	ction on	0.443 in Ratio = 0.000 in Ratio = 0.819 in Ratio = 0.000 in Ratio =	338 >=240 0 <240 183 >=180 0 <180		

Maximum Forces & Stresses for Load Combinations

1

0.8190

Load Combination		Max Stres	s Ratios								Mor	nent Values			Shear Va	lues
Segment Length	Span #	М	V	Сd	C _{F/V}	Сi	Cr	Сm	C t	C ^L	М	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.580	0.147	0.90	1.300	1.00	1.15	1.00	1.00	1.00	0.44	702.30	1210.95	0.13	23.87	162.00
+D+S					1.300	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.988	0.251	1.15	1.300	1.00	1.15	1.00	1.00	1.00	0.96	1,528.54	1547.33	0.29	51.96	207.00
+D+0.750S					1.300	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.854	0.217	1.15	1.300	1.00	1.15	1.00	1.00	1.00	0.83	1,321.98	1547.33	0.25	44.93	207.00
+0.60D					1.300	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.196	0.050	1.60	1.300	1.00	1.15	1.00	1.00	1.00	0.27	421.38	2152.80	0.08	14.32	288.00
Overall Maxir	num De	flectio	ns													
Load Combination		9	Span	Max. "-"	' Defl	Locatior	n in Span		Load Co	mbinatio	n		Max. "+"	'Defl L	ocation in	Span

6.296



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Vertical Reactions	Support notation : Far	left is #1	Values in KIPS		
Load Combination	Support 1	Support 2			
Overall MAXimum	0.308	0.308			
Overall MINimum	0.167	0.167			
D Only	0.142	0.142			
+D+S	0.308	0.308			
+D+0.750S	0.267	0.267			
+0.60D	0.085	0.085			
S Only	0.167	0.167			