



April 20, 2022

Walker Custom Homes, LLC
Attn: Jason Walker & Pete Pine

Re: 1604 SW 27th Street, Lee's Summit, MO (Lot 48, Whispering Woods, 2nd Plat)

Vista Structural Engineering, LLC, was asked to address the following city inspection comments for the house being built at 1604 SW 27th St., in Lee's Summit, MO:

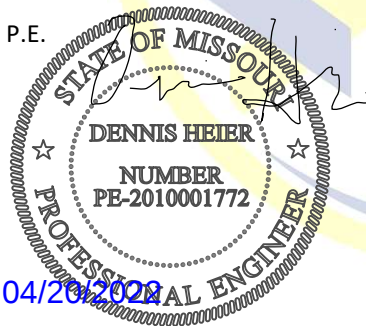
- **Address the covered patio that was framed differently from what was shown on the plans.** *The plans originally showed a covered patio with two piers and an LVL beam spanning 16'-0"; however, a third pier was installed and the beams were installed as (2) #2 – 2x10's. Based on the attached calculations, the three piers installed as 24"-diameter by 3'-0"-deep and the double 2x10 beams will adequately support all imposed design loading. Revised main floor and foundation partial plans have been attached to the following pages of this report, for clarification.*

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,

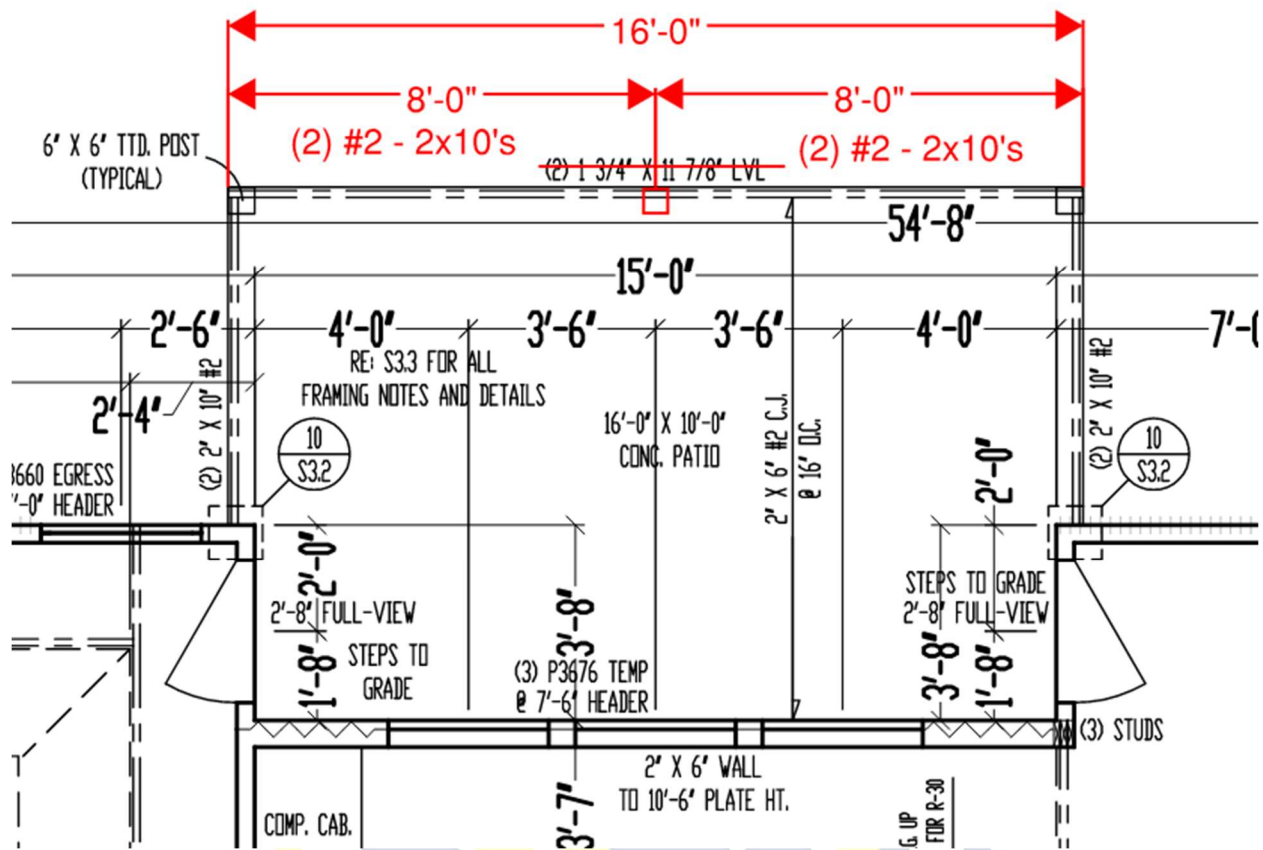
Vista Structural Engineering, LLC

Dennis Heier, P.E.



VISTA STRUCTURAL ENGINEERING, LLC

14718 NW DELIA STREET
PORTLAND, OREGON 97229



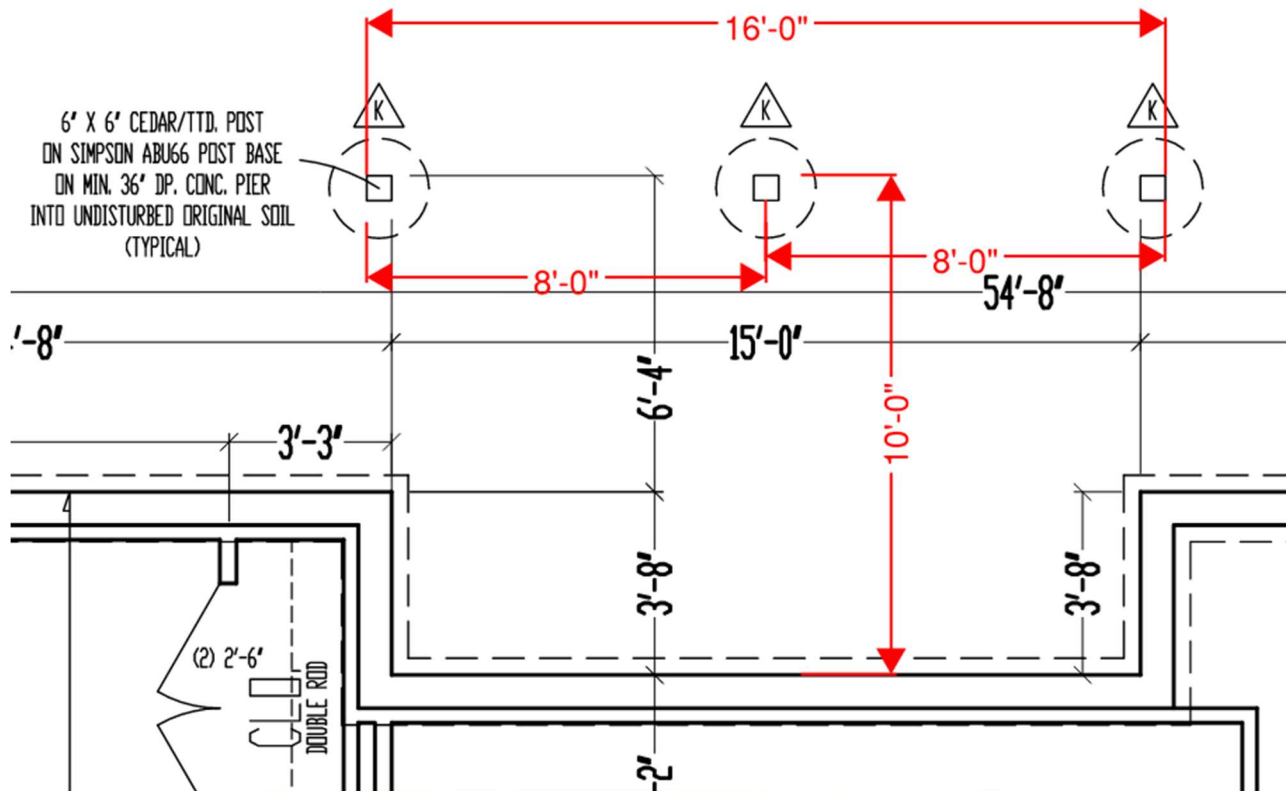
1604 SW 27th Street - Revised Main Floor Plan

VISTA STRUCTURAL ENGINEERING, LLC

14718 NW DELIA STREET
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PHONE: 971.233.6099
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1604 SW 27th Street - Revised Foundation Plan

VISTA STRUCTURAL ENGINEERING, LLC

14718 NW DELIA STREET
 PORTLAND, OREGON 97229

Wood Beam

File: WWS048.ec6
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Vista Structural Engineering, LLC

Lic. #: KW-06010523

DESCRIPTION: 1604 SW 27th St - revised beam headers at patio

CODE REFERENCES

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

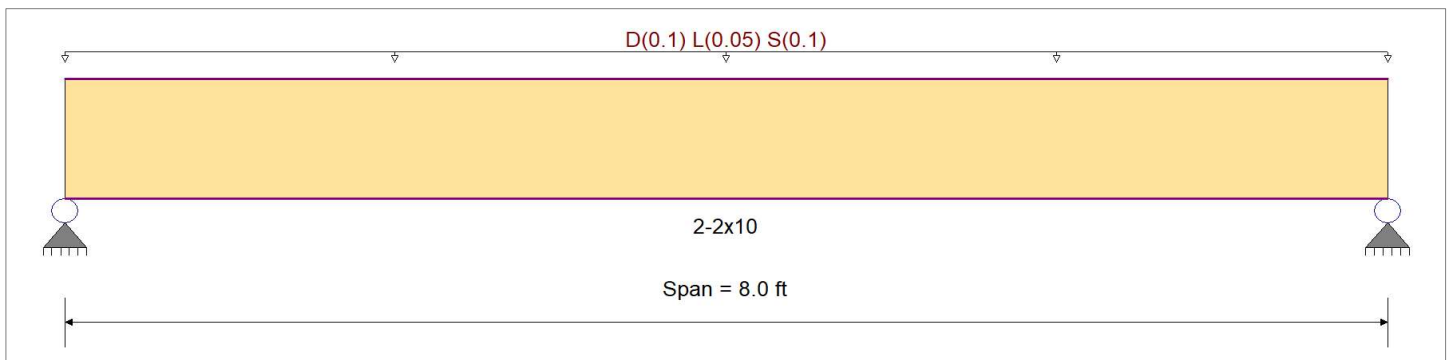
Material Properties

Analysis Method : Allowable Stress Design
Load Combination IBC 2018

Wood Species : DouglasFir-Larch
Wood Grade : No.2

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

Fb + 900.0 psi
Fb - 900.0 psi
Fc - Prll 1,350.0 psi
Fc - Perp 625.0 psi
Fv 180.0 psi
Ft 575.0 psi
E : Modulus of Elasticity
Ebend- xx 1,600.0 ksi
Eminbend - xx 580.0 ksi
Density 31.210pcf



Applied Loads

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

Uniform Load : D = 0.020, L = 0.010, S = 0.020 ksf, Tributary Width = 5.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.419 : 1	Maximum Shear Stress Ratio	=	0.180 : 1
Section used for this span		2-2x10	Section used for this span		2-2x10
fb: Actual	=	476.84 psi	fv: Actual	=	37.23 psi
Fb: Allowable	=	1,138.50 psi	Fv: Allowable	=	207.00 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	7.241 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.029 in	Ratio =		3278 >= 360
Max Upward Transient Deflection		0.000 in	Ratio =		0 < 360
Max Downward Total Deflection		0.062 in	Ratio =		1542 >= 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 _{FV}	C _i	C _r	C _m	C _t	C _L		M	fb	F'b	V	fv	F'v
D Only Length = 8.0 ft	1	0.252	0.108	0.90	1.100	1.00	1.00	1.00	1.00	1.00		0.80	224.40	891.00	0.32	17.52	162.00
+D+L Length = 8.0 ft	1	0.340	0.146	1.00	1.100	1.00	1.00	1.00	1.00	1.00		1.20	336.60	990.00	0.49	26.28	180.00
+D+S Length = 8.0 ft	1	0.394	0.169	1.15	1.100	1.00	1.00	1.00	1.00	1.00		1.60	448.79	1138.50	0.65	35.04	207.00
+D+0.750L Length = 8.0 ft	1	0.249	0.107	1.25	1.100	1.00	1.00	1.00	1.00	1.00		1.10	308.55	1237.50	0.45	24.09	225.00
+D+0.750L+0.750S Length = 8.0 ft	1	0.419	0.180	1.15	1.100	1.00	1.00	1.00	1.00	1.00		1.70	476.84	1138.50	0.69	37.23	207.00
+0.60D Length = 8.0 ft	1	0.085	0.036	1.60	1.100	1.00	1.00	1.00	1.00	1.00		0.48	134.64	1584.00	0.19	10.51	288.00

Vista Structural Engineering, LLC
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 (971) 233-6099
 dennis@vistastructural.com

Project Title:
 Engineer:
 Project ID:
 Project Descr:

Printed: 20 APR 2022, 11:44AM

Wood Beam

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 Vista Structural Engineering, LLC

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DESCRIPTION: 1604 SW 27th St - revised beam headers at patio

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.0622	4.029		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.850	0.850
Overall MINimum	0.400	0.400
D Only	0.400	0.400
+D+L	0.600	0.600
+D+S	0.800	0.800
+D+0.750L	0.550	0.550
+D+0.750L+0.750S	0.850	0.850
+0.60D	0.240	0.240
L Only	0.200	0.200
S Only	0.400	0.400

DECK PIERS	
P (LBS.)	1700
SOIL BEARING (PSF)	1500
REQ. AREA (FT^2)	1.13
DIAMETER (IN.)	14.4