SED ENGINEERING, INC.
Consulting Structural and Civil Engineers
5907 Raytown Trafficway
Raytown, Missouri 64133
816-356-1445

January 26, 2025

Development Services
220 SE Green
Lee's Summit, MO 64063

RE: Construction Inspection – 1408 NE Ernest Way

To Whom it May Concern:

We are in receipt of recent framing inspection comments for the referenced project and have the following responses.

1. "Engineer address for top flange cut at return air adjacent to fireplace"
   The top flange cut is a bevel at not quite one half of the top chord of a double TJI. The double TJI is under a wall but there is no load coming to the wall as the roof and ceiling framing are trusses. The TJI's are 11 7/8" TJI 210's spanning 16'-6". From the attached load table, the allowable total load for this size and span is 106 plf or 212 plf for a double. Given the amount of beveling of the top chord, I estimate that the allowable load will be approximately 3/4 of that of an unmolested joist. 3/4 of 212 is 159 plf. The design load in this area is 1.33 x 50 psf + 10' x 6 psf (wall) = 127 plf < 159 plf. It is my opinion that the Joists are adequate as installed.

2. "Engineer address for cut off of TJI joist top flanges below master shower"
   The TJI joists under the master shower have had the top 2 1/2" cut off to allow for a zero entry at the shower. A 2x10 has been installed alongside each of the trimmed joists to reinforce the weakened area. The 2x10's span between the wall and beams. The attached calculations show that the combined sections have a capacity just greater than the design load. It is my opinion that the trimmed joists with 2x10 reinforcement are adequate.

3. "Engineer address for notched joist outside rear basement bathroom"
   Approximately 3/4" deep radiused notch has been cut from the top flange of a TJI joist for installation of a drain. The notch is near mid-span of the joist over the hallway between the left rear bath and the mechanical room. The amount of material missing from the top flange reduces the capacity of the joist to just below the design value. I recommend that a spacer be installed between the bottom of the cut joist and the top of the bathroom wall to provide intermediate support.

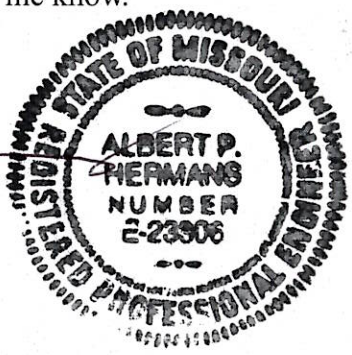
4. "Engineer address for slab support at entry door to theater room"
   A double 2x10 header is installed above the door opening. The attached calculations show that the header is adequate.

5. "Engineer address missing I beam above theater room"
   The I-beam has been replaced with a bearing wood stud wall consisting of double 2x6 studs @ 16" on center bearing on a concrete floor beam below. The attached calculations show the capacity of the wall studs. Sheet F2 has been revised to show the as-built framing.

6. "Update plan to reflect current construction (suspended-slab-support foundation wall omitted for stud walls, laundry and bathroom, etc.)"
   The basement floor plan and foundation plans have been revised to reflect the as-built conditions.

If there are any questions, please let me know.

Yours truly,



Albert Hermans, P.E.

FLOOR LOAD TABLE

Floor—100% (PLF)

Depth	TJI®	Joist Clear Span																	
		8'		10'		12'		14'		16'		18'		20'		22'		24'	
		Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load	Live Load L/480	Total Load
9½"	110	*	190	140	152	85	127	56	99	38	76								
	210	*	210	161	169	99	141	65	119	45	90								
	230	*	236	175	190	108	158	71	133	49	99								
11⅞"	110	*	190	*	152	*	127	92	109	63	95	45	76						
	210	*	210	*	169	*	141	106	121	74	106	53	92						
	230	*	236	*	190	*	158	116	136	80	119	58	102	43	83				
	360	*	241	*	193	*	162	136	139	95	121	69	108	51	97	39	78		
	560	*	294	*	236	*	197	*	169	138	148	101	132	76	119	58	108	45	91
14"	110	*	190	*	152	*	127	*	109	91	95	66	85						
	210	*	210	*	169	*	141	*	121	*	106	76	94	57	85				
	230	*	236	*	190	*	158	*	136	115	119	83	106	62	95	47	81		
	360	*	241	*	193	*	162	*	139	*	121	98	108	73	97	56	88	44	81
	560	*	294	*	236	*	197	*	169	*	148	*	132	107	119	83	108	65	99
16"	110	*	190	*	152	*	127	*	109	*	95	*	85	66	76				
	210	*	210	*	169	*	141	*	121	*	106	*	94	76	85	58	77		
	230	*	236	*	190	*	158	*	136	*	119	*	106	83	95	64	87	50	78
	360	*	241	*	193	*	162	*	139	*	121	*	108	*	97	75	88	59	81
	560	*	294	*	236	*	197	*	169	*	148	*	132	*	119	*	108	86	99

* Indicates that **Total Load** value controls.

How to Use This Table

1. Calculate actual total and live load in pounds per linear foot (plf).
2. Select appropriate **Joist Clear Span**.
3. Scan down the column to find a TJI® joist that meets or exceeds actual total and live loads.

Refer to PSF to PLF Conversion table on page 31

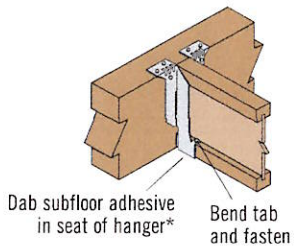
General Notes

- Table is based on:
  - Minimum bearing length of 1¾" end and 3½" intermediate, without web stiffeners
  - Uniform loads.
  - More restrictive of simple or continuous span
  - No composite action provided by sheathing.
- **Total Load** values are limited to deflection of L/240.
- **Live Load** is based on joist deflection of L/480.
- If a live load deflection limit of L/360 is desired, multiply value in **Live Load** column by 1.33. The resulting live load must not exceed the **Total Load** shown.
- Table does not account for concentrated loads. Use Weyerhaeuser software when this condition applies.

TIPS FOR PREVENTING FLOOR NOISE

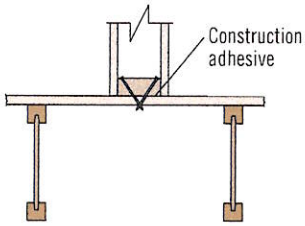
Trus Joist® TJI® joists are structurally uniform and dimensionally stable, and they resist shrinking and twisting. This helps prevent gaps from forming around the nails between the joist and the floor panels—gaps that can potentially cause squeaks or other floor noise. Using TJI® joists can help you build a quieter floor, but only if the entire floor system is installed properly. This is because other components of the floor system, such as hangers, connectors, and nails can be a source of floor noise.

Properly Seat Each Joist in Hanger



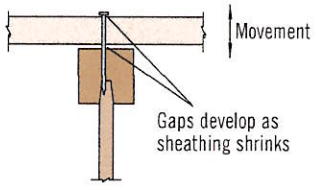
Seat the joist tight to the bottom of the hanger. When using hangers with tabs, bend the flange tabs over and nail to the TJI® joist bottom flange. Placing a dab of subfloor adhesive* in the seat of the hanger prior to installing the joist can reduce squeaks.

Use Adhesive and Special Nailing When Needed



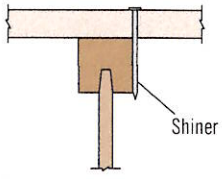
Nail interior partitions to the joists when possible. If the wall can be nailed only to the floor panel, run a bead of adhesive* under the wall and either cross nail, nail through and clinch tight, or screw tightly into the wall from below.

Prevent Shrinkage



Keep building materials dry, and properly glue floor panels to the joists. Panels that become excessively wet during construction shrink as they dry. This shrinkage may leave gaps that allow the panel to move when stepped on.

Avoid "Shiners"



Exercise care when nailing. Nails that barely hit the joists (shiners) do not hold the panel tight to the joist and should be removed. If left in, the nails will rub against the side of the joist when the panel deflects.

* Weyerhaeuser recommends using solvent-based subfloor adhesives that meet ASTM D3498 (AFG-01) performance standards. When latex subfloor adhesive is required, careful selection is necessary due to a wide range of performance between brands.

For more information and tips on how to prevent floor noise, refer to the Weyerhaeuser Prevention and Repair of Floor System Squeaks Technical Resource Sheet, 9009, or contact your Weyerhaeuser representative.

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JOB 1408 NE ERNEST WAY
SHEET NO. 1 OF
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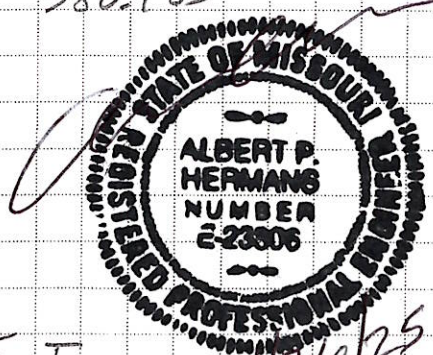
CHECKED BY DATE
SCALE FRAMING CALCS

TRIMMED JOISTS UNDER SHOWER

	A	d	Ad	Ad^2
2X10	13.875	4.625	64.172	296.795
BOT FLG	2.707	0.656	1.776	1.165
WEB	2.977	5.281	15.722	83.025
	19.559		81.67	380.985

	I_{oo}
2x10	98.932
BOT FLG	0.389
WEB	15.628
	114.948



1/26/25

$\Sigma Ad^2 + \Sigma I_{oo} = 495.933 = \Sigma I$

$\bar{y} = \Sigma Ad / \Sigma A = 4.176''$

$\bar{I} = \Sigma I - \Sigma A \bar{y}^2 = 154.914\ in^4$

$S_x = \bar{I} / \bar{y} = 37.096\ in^3$ (TENSION)
$= \bar{I} / y' = 30.531\ in^3$ (COMPRESSION)

$M_{ALLOW} = 30.531 \times 900\ psi = 27,478\ in\text{-}lb$

$W_{ALLOW} = 27,478 / 1.5 \times 16.5^2 = 67.3\ plf$

$W_{ACTUAL} = 1.33 \times 50\ psf = 66.7\ plf$ OK

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DOOR HEADERS UNDER GARAGE SLAB

2-2X10

DL = SLAB & DECK = 68 psf
MISC DL = 5 psf
73 psf
LL = 50 psf
123 psf

$W = 12.5' \times 123 psf = 1538 plf$

$M = 1538 \times 3.5^2 \times 1.5 = 28,252 in\text{-}lb$

$f_b = 28,252 / 2 \times 21.391 = 660.4 psi$

$F_b = 900 psi$ (#2 DOUG FIR)

$\Delta = 5 \times 1538 \times 3.5 \times 42^3 / 384 \times 1700000 \times 2 \times 98.93 = 0.031''$
$= l/1360$

WALL STUDS SUPPORTING GARAGE SLAB

2-2x6 @16" o.c.

W = 1538 plf (SEE ABOVE)

P/STUD = 1538 x 1.33 / 2 = 1025 lb

$f_a = 1025 / 8.25 = 124.3 psi$

$F_c^* = F_c \times C_D \times C_M \times C_t \times C_f \times C_i = 625 psi$

$F_c = 625 psi$
$C_D = 1.0$
$C_M = 1.0$
$C_t = 1.0$
$C_f = 1.0$
$C_i = 1.0$

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$$F'_c = F_c^* \times C_p = 541 \text{ psi} \quad \text{ok}$$

$$C_p = \frac{1+(F_{CE}/F_c^*)}{2c} - \sqrt{\left[\frac{1+(F_{CE}/F_c^*)}{2c}\right]^2 - \frac{F_{CE}/F_c^*}{c}} = 0.866$$

$$F_{CE} = \frac{0.822 \times E'_{MIN}}{(l_e/d)^2} = 1236 \text{ psi}$$

$E'_{MIN} = 580{,}000$ psi
$l_e = 108''$
$d = 5.5''$
$c = 0.8$