

Structural Calculations Addendum

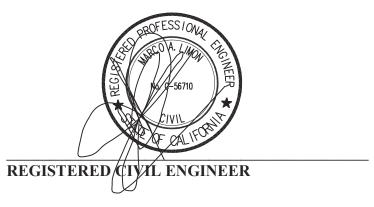
DAMM ADUs

5586 Hamill Ave. San Diego, Ca

Prepared by:

Marco A. Limon, P.E.

July 17, 2025



This Project has been prepared under the direction of the aforementioned Registered Civil Engineer. The engineer attests to the technical information contained herein and the engineering data and calculations upon which recommendations, conclusions and decisions are based. The engineer is not responsible for any deviations made in the field from these calculations and or the corresponding project plans.

1.0 General Notes

- 1.1 Governing Code: 2022 California Building Code
- 1.2 All work shall comply with the aforementioned building code and shall be performed in accordance with all applicable Federal, State, and Local safety codes, and ordinances.
- 1.3 The prime contractors and all subcontractors shall verify all dimensions, elevations, and site conditions before starting work and the engineer or architect shall be notified in writing immediately of any discrepancies.
- 1.4 Any conflicts and omissions between this report, specifications and/or working drawings shall be communicated to the engineer before proceeding with the work involved.
- 1.5 Working dimensions shall not be scaled from any of the plan sections, details, or sketches in this report.
- 1.6 The prime contractor and all subcontractors shall verify all headers, beams, rafters, supports and all site conditions prior to beginning work.
- 1.7 The structural calculations in this report are for the analysis and design of primary structural systems. All and any other attachments of non-structural members or elements are the responsibility of the prime contractor or its subcontractors unless noted otherwise.
- 1.8 The contract to perform structural calculations does not include any observations and or inspection. The engineer does not assume any responsibility for quality control or inspection performed by others.
- 1.9 The use of any drawings, calculations, and specifications in this report outside of this contract is strictly prohibited.

2.0 Limitations

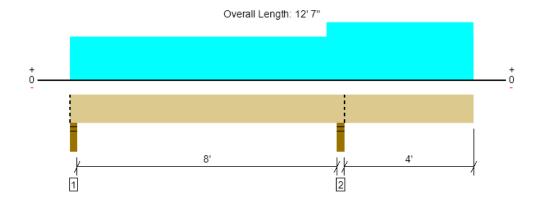
- 2.1 The opinions and recommendations presented in this report are based upon available data provided by the client, superficial observations, and in accordance with the constructions plans prepared by others.
- 2.2 Should the owner, prime contractor, or any of its subcontractors encounter conditions different from those presented in this report or during construction, the engineer shall be notified immediately so that the engineer is able to analyze the situation.
- 2.3 The structural calculations in this report were performed in accordance with the industry standard. The engineer does not assume any responsibility for work or design done by others.

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Level, Copy of Floor: Floor Joist

1 piece(s) 1 3/4" x 7 1/4" 2.0E Microllam® LVL @ 16" OC



Drawing is Conceptual. All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal (typ.).

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	894 @ 8' 5 1/4"	3828 (3.50")	Passed (23%)		1.0 D + 1.0 L (All Spans)
Shear (lbs)	380 @ 7' 8 1/4"	2411	Passed (16%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-917 @ 8' 5 1/4"	3700	Passed (25%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.149 @ 12' 7"	0.276	Passed (2L/668)		1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.165 @ 12' 7"	0.415	Passed (2L/604)		1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	61	40	Passed		

Member Length : 12' 7" System : Floor Member Type : Joist Building Use : Residential Building Code : IBC 2018 Design Methodology : ASD

- Deflection criteria: LL (L/360) and TL (L/240).
- Overhang deflection criteria: LL (2L/360) and TL (2L/240).
- Allowed moment does not reflect the adjustment for the beam stability factor.
- A 4% increase in the moment capacity has been added to account for repetitive member usage.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None.

	В	earing Leng	th	Load	ls to Supports ((lbs)		
Supports	Total	Available	Required	Dead	Floor Live	Factored	Accessories	
1 - Stud wall - DF	3.50"	3.50"	1.50"	87	231/-84	318	Blocking	
2 - Stud wall - DF	3.50"	3.50"	1.50"	248	646	894	Blocking	

[•] Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.

Lateral Bracing	Bracing Intervals	Comments
Top Edge (Lu)	12' 7" o/c	
Bottom Edge (Lu)	12' 7" o/c	

 $[\]bullet \mbox{Maximum allowable bracing intervals based on applied load. } \\$

Vertical Loads	Location (Side)	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 12' 7"	16"	20.0	40.0	Default Load
2 - Uniform (PSF)	8' to 12' 6 15/16"	16"		20.0	

Member Notes

Floor Joists (FJ-1)

Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards. Weyerhaeuser Engineered Lumber Products have been evaluated by ICC-ES under evaluation reports ESR-1153 and ESR-1387 and/or tested in accordance with applicable ASTM standards. For current code evaluation reports, Weyerhaeuser product literature and installation details refer to www.weyerhaeuser.com/woodproducts/document-library.

The product application, input design loads, dimensions and support information have been provided by Marco A. Limon

ForteWEB Software Operator	Job Notes
Marco A. Limon Civil Engineering Consulting Services (760) 235-1176 marco@engineeringconsulting.us	



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Seismic Analysis:

DAMM ADU's

INPUT DATA

Seis. Des. Cat. =
$$D$$

 $X = 0.75$
 $T_a = C_t(h_n)^x = 0.203$ Sec, (ASCE 12.8.2.1)
 $k = 1.00$ (ASCE 12.8.3)
 $T_L = 8.00$ Sec, (ASCE Fig 22-14)
 $C_s = S_{DS}/(R/I_e) = 0.11$ (ASCE 12.8-2)
 $C_s = S_{D1}/T(R/I_e) = 0.31$ (ASCE 12.8-3) Max. Cs for T<=TL
 $C_s = S_{D1}T_L/T^2(R/I_e) = 12.33$ (ASCE 12.8-4) Max. Cs for T>TL
 $C_s = 0.044S_{DS}I_e = 0.03$ (ASCE 12.8-5) C_s Min
 $C_s = 0.5S_1/(R/I_e) = 0.02$ (ASCE 12.8-6) C_s Min when $S_1 > 0.6g$

0.02 (ASCE 12.8-2)

6.5 (ASCE 12.2.1)

Cs = 0.11

Ct =

R =

T. Base Shear = 11.8 Kips (SD)

 $\begin{aligned} \mathsf{F}_{\mathsf{pmax}} &= \ \mathbf{0.4S_{\mathsf{DS}}} \mathsf{IW}_{\mathsf{PX}} \\ \mathsf{F}_{\mathsf{pmin}} &= \ \mathbf{0.2S_{\mathsf{DS}}} \mathsf{IW}_{\mathsf{PX}} \end{aligned}$

Level	Level	Floor	Height	Weight			Lateral Fo	rce @ Eac	h Level	Dia	phragm Fo	rce	Floor	Story
No.	Name	Height	hx	Wx	$W_x h_x^{k}$	C _{vx}	Fx	Vx	O.M.	ΣFi	ΣW_i	F _{PX}	Area	Shear
		ft	ft	k			k	k	k-ft	k	k	k	sqft	#/sqft
2	Roof		19	60.72	1153.7	0.723	8.50			8.50	60.722	8.50	630	13.50
		10						8.50						
1	2nd		9	49.15	442.3	0.277	3.26		85.04	11.76	109.87	6.84	1286	9.15
		9						11.76						
	Ground			109.87	1596.1		11.76		123.40			·		

No.	Name	Grid	Trib Area	Wall V	VW Length	V Req	ОМ	Uplift	V Wall	Strap	Type	VW Req
2	Roof	Line	sqft	lbs	ft	lbs/ft	ft-lbs	lbs	Syst.	Туре	lbs/ft	ft
	to	1	764	7366.4	20.5	359.3	73663.7	3593.4	3	MSTI48	510	14.4
	2nd Floor	2	764	7366.4	19.7	373.9	73663.7	3739.3	3	MSTI48	510	14.4
		Grid	Trib Area	Mall M	VW Length		ОМ	Uplift	V Wall	Stran		
		Line	sqft	lbs	ft	lbs/ft	ft-lbs	lbs		Strap		
		A	382	3683.2		193.9	36831.9	1938.5	Syst. 1	Type MSTI48	260	14.2
		В	382	3683.2		263.1	36831.9	2630.8	1	MSTI48	260	14.2
		J	SW Length		13.2 f		ype 1 SW=	280.0 plf	-	14151116	200	11.2
		С	382	3683.2	25	147.3	36831.9	1473.3	1	MSTA24	260	14.2
		D	382	3683.2	19	193.9	36831.9	1938.5	1	MSTI48	260	14.2
No.	Name	Grid	Trib Area	Wall V	VW Length		ОМ	Uplift	V Wall	HD		
						11 /£	£ 11	II. a		T		
2	2nd Floor	Line	sqft	lbs	ft	lbs/ft	ft-lbs	lbs	Syst.	Туре		
2	to	Line 1	sqft 368	lbs 6087.9		297.0	π-ibs 54790.7	2672.7	Syst.		4 Post N 1/	4x2.5 SDS SCREWS
2					20.5					HDU2 w 4x		4x2.5 SDS SCREWS /4x2.5 SDS SCREWS
2	to	1	368	6087.9	20.5 19.8	297.0	54790.7	2672.7	2	HDU2 w 4x	4 Post N 1	
2	to	1 1A 2	368 615 248	6087.9 11385.0 5303.7	20.5 19.8 19.7	297.0 575.0	54790.7 102465.4 47733.5	2672.7 5175.0 2423.0	2 4 1	HDU2 w 4x HDU5 W 4x HDU2 w 4x	4 Post N 1	/4x2.5 SDS SCREWS
2	to	1 1A 2 Grid	368 615 248 Trib Area	6087.9 11385.0 5303.7 Wall V	20.5 19.8 19.7 VW Length	297.0 575.0 269.2	54790.7 102465.4 47733.5 OM	2672.7 5175.0 2423.0 Uplift	2 4 1 V Wall	HDU2 w 4x HDU5 W 4x HDU2 w 4x	4 Post N 1	/4x2.5 SDS SCREWS
2	to	1 1A 2 Grid Line	368 615 248 Trib Area sqft	6087.9 11385.0 5303.7 Wall V lbs	20.5 19.8 19.7 VW Length ft	297.0 575.0 269.2 Ibs/ft	54790.7 102465.4 47733.5 OM ft-lbs	2672.7 5175.0 2423.0 Uplift lbs	2 4 1 V Wall Syst.	HDU2 w 4x HDU5 W 4x HDU2 w 4x HD Type	4 Post N 1/ 4 Post N 1/	/4x2.5 SDS SCREWS /4x2.5 SDS SCREWS
2	to	1 1A 2 Grid Line A	368 615 248 Trib Area	6087.9 11385.0 5303.7 Wall V	20.5 19.8 19.7 VW Length ft	297.0 575.0 269.2	54790.7 102465.4 47733.5 OM	2672.7 5175.0 2423.0 Uplift	2 4 1 V Wall	HDU2 w 4x HDU5 W 4x HDU2 w 4x HD Type HDU2 w 4x	4 Post N 1/ 4 Post N 1/ 4 Post N 1/	/4x2.5 SDS SCREWS /4x2.5 SDS SCREWS /4x2.5 SDS SCREWS
2	to	1 1A 2 Grid Line	368 615 248 Trib Area sqft 382	6087.9 11385.0 5303.7 Wall V Ibs 6179.3	20.5 19.8 19.7 VW Length ft 19 25	297.0 575.0 269.2 Ibs/ft 325.2	54790.7 102465.4 47733.5 OM ft-lbs 55614.1	2672.7 5175.0 2423.0 Uplift Ibs 2927.1	2 4 1 V Wall Syst. 2	HDU2 w 4x HDU5 W 4x HDU2 w 4x HD Type HDU2 w 4x HDU2 w 4x	4 Post N 1/ 4 Post N 1/ 4 Post N 1/ 4 Post N 1/	/4x2.5 SDS SCREWS /4x2.5 SDS SCREWS

Shear Wall Aspect Ratio Factor

2nd Floor							
Floor Ht.		SW		Shear	· Wall		
10 ft	Grid	Length	ASF	Capacity	Red. Cap.	Capacity Req'd	SW Adequate
	1	3.83	0.92	510.00	359.34	178.05	GOOD
				Type 3			
1st Floor							
Floor Ht.							
9 ft	1A	2.92	0.86	1100.00	951.20	575.00	GOOD
				Type 4			

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				l ight Frame	Shearwalls - D	eflection C:	alcs														\vdash
				Light Hunte	Oncarwada	l citation of	1100														$\overline{}$
Roof Level	305.9			4x4 end					(Vn/769)^3.276				1		2	3	4		in		
Walls Along Axis 1		Strength Level, v (plf)	h (ft)	A (sq in)	E (psi)		Gv*tv (for plywood) (psi)	vn (lb)	en (in)	∆a (in	υ) Δ	Δ =	8*v*h^3/E*A*b	vh	ı/Gvtv	0.75 he n	Δa h/b		$\delta_{\rm M} = c_{\rm d} * \delta_{\rm max} / l_{\rm e}$	Cd	le
3'-10" wall	115	164	8	12.25	1.20E+06	3.83	45500		0.006282451	0.	3 0.	69	1.19E-02	0	.028766	0.037695	0.611544		2.76	4	1
6'-5" Wall	191	273	8	12.25	1.20E+06	6.4	45500		0.033776568	0.			1.19E-02			0.202659			3.50	4	1
Ignore 2'-6"											0.	00									
											0.	00							1.54		
Walls Along Axis 2												00									
5'-11" Wall	238.2		8	12.25	1.20E+06	5.92	45500		0.069228916		0.		1.60E-02				0.457066		1.83		
3'-11" Wall	157.8	225.36585	8	12.25	1.20E+06	3.92	45500		0.017937701		0.	73	1.60E-02	0	.039625	0.107626	0.565179		2.26		
																			1.01	4	1
				3							-										\vdash
A	1		vh/Gvtv	J	∆a h/b									COLLADE D	00705	SUM OF TH	E SQUARES	(CDCC)			\vdash
Δ =	8vh^3/EAb		VII/OVLV	0.7511011	Датир									SQUARE N	OUTUF	ON OF TH	ESQUARES	(SNSS)	1.8	inches	
									Туре ес	quation h	ere.	∆-total =	$\frac{\Delta 1 * \Delta 2}{\Delta 1 + \Delta 2}$								
													$\Delta 1 + \Delta 2$								
Tiedown Ass	l sembly Displa	cements																			
HEUDWIINS	Cilibry Dispu	Centents																			
	AS	SD			L	RFD															
					Tiedown	Assembly Di	splacement														
Walls Along		Tiedown		Elongation	Shrink (.002)*d* (19-		Slip (same as														
					13)	Crush	e n) as is nailed	Δa (in)		d (floor a		in									
3'-10" wall		Nailed	4369					0.292777		15.7	5										
6'-5" Wall	3058	Nailed	4369	0.05	0.189	0.02	0.033776568	0.292777													-
Ignore 2'-6"																					
Walls Along Axis 2																					
5'-11" Wall		Nailed	5657.143			0.02	0.069228916														
3'-11" Wall		Nailed	5657.143		0.189	0.02	0.017937701	0.276938			1										
9.82	3960	Nailed	5657.143	0.07		0.02	0	0.296938									<u> </u>				