

November 22, 2019

Scott Guy
Building Inspector
Harnett County Inspections Dept.
Lillington NC

Re: Lemus Garage Addition
1052 Rosser Pittman Rd.
Broadway, NC 27505

Dear Scott,

At the request of Juan Lemus, I have been out and examined the construction of his detached garage addition at the above address.

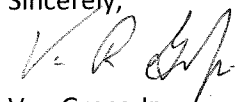
The garage is 24'0 by 24'0 and the net spans are 23'4" by 23'4". It is 76" of net span from each sidewall to a clear height of 42" between the ceiling and rafters and this live load is calculated at 10#/sf. The remaining span (10'8") which exceeds 42" in height is considered limited storage at a load of 20#/sf.

The live load of the attic space using these numbers from the NC Residential Building Code comes to a potential of 7934# of live load over the entire clear area of 544.44 sf. This results in a single beam in the middle of the span that would need to carry 170#/lf of live load, or two evenly spaced beams would need to carry 113.33#/lf live load. To keep head room available for the garage door, I recommend using two beams consisting of three (3) 11-1/4" 1.9 LVLs, which are rated at a load of 123#/lf on a 24' span with a deflection of L/360. Either USP HD5210 or Simpson HHUS5.50/10 face mount hangers would be more than sufficient to attach to the 11-1/4" LVLs in the garage door opening. The LVLs can be supported in the rear by creating 2 x 12 headers under the top plates and hanging the LVL on the new headers. (LVL load chart and Simpson and USP hanger information attached). As an alternative to the rear headers, the top plate can be cut, and a post consisting of 2-2x6s sandwiching a 1/2" OSB could be placed in the wall under the LVLs, with King studs on each side of the LVL and strapping the cut top plate to the LVL on each side.

The 2 ply 16" LVL that spans the 18' opening for the garage door is designed to carry 491# LF I/360. The load placed on this LVL by attaching a beam to it will be 1983# total, which is 110#/LF. The load of the gable wall and small amount of roof and overhang is small, and the LVL over the garage door used as a header is significantly oversized for the load it is currently carrying.

So in summary, two beams, each consisting of 3- 11-1/4" LVLs need to be mounted with a faceplate hanger at each end attached to the existing header over the garage door and new small headers at the rear. This repair will be more than sufficient to carry the necessary load.

Sincerely,



Van Groce Jr.

Custom Contracting Corporation, NCGCBL #8664

FLOOR LOAD TABLES

General Notes

- Table is based on:
 - Uniform loads (beam weight considered).
 - More restrictive of simple or continuous span.
 - Deflection criteria of L/240 total load (TL) and L/360 live load (LL).
- For live load deflection limits of L/240 or L/480, multiply **Live Load L/360** values by 1.5 or 0.75, respectively. The resulting live load must not exceed the total load shown.

Also see *How to Use This Table* on page 18 and *General Assumptions* on page 5.

1.9E Microllam® LVL: Floor—100% (PLF) *continued*

Span	Condition	3½" Width (2-ply)				5¼" Width (3-ply)									
		14"	16"	18"	20"	5½"	7¼"	9¼"	9½"	11¼"	11½"	14"	16"	18"	20"
6'	Total Load	3,589	3,917	3,917	3,917	1,297	2,287	3,082	3,188	3,972	4,272	5,384	5,875	5,875	5,875
	Live Load L/360	*	*	*	*	870	1,879	*	*	*	*	*	*	*	*
	Min. End/Int. Bearing (in.)	4.1/10.3	4.5/11.3	4.5/11.3	4.5/11.3	1.5/3.5	1.8/4.4	2.4/5.9	2.4/6.1	3.0/7.6	3.3/8.2	4.1/10.3	4.5/11.3	4.5/11.3	4.5/11.3
8'	Total Load	2,414	2,885	2,932	2,932	438	978	2,086	2,193	2,745	2,935	3,621	4,328	4,399	4,399
	Live Load L/360	*	*	*	*	380	842	1,666	1,792	*	*	*	*	*	*
	Min. End/Int. Bearing (in.)	3.7/9.3	4.4/11.1	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	2.1/5.3	2.2/5.6	2.8/7.0	3.0/7.5	3.7/9.3	4.4/11.1	4.5/11.3	4.5/11.3
9'-6"	Total Load	1,937	2,294	2,466	2,466	219	498	1,475	1,551	2,128	2,354	2,905	3,441	3,699	3,699
	Live Load L/360	*	*	*	*	*	*	1,032	1,112	1,778	2,061	*	*	*	*
	Min. End/Int. Bearing (in.)	3.5/8.8	4.2/10.5	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	1.8/4.5	1.9/4.7	2.6/6.5	2.9/7.2	3.5/8.8	4.2/10.5	4.5/11.3	4.5/11.3
10'	Total Load	1,817	2,147	2,342	2,342	177	406	1,325	1,398	1,919	2,123	2,725	3,221	3,513	3,513
	Live Load L/360	*	*	*	*	*	*	893	963	1,544	1,792	*	*	*	*
	Min. End/Int. Bearing (in.)	3.5/8.7	4.1/10.3	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	1.7/4.3	1.8/4.5	2.5/6.1	2.7/6.8	3.5/8.7	4.1/10.3	4.5/11.2	4.5/11.2
12'	Total Load	1,333	1,709	1,948	1,948	82	193	781	844	1,327	1,469	2,000	2,563	2,922	2,922
	Live Load L/360	1,138	1,635	*	*	*	*	530	572	927	1,080	1,707	2,453	*	*
	Min. End/Int. Bearing (in.)	3.1/7.7	3.9/9.9	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	2.0/5.1	2.3/5.7	3.1/7.7	3.9/9.9	4.5/11.2	4.5/11.2
14'	Total Load	975	1,253	1,563	1,667		100	494	535	879	1,028	1,463	1,880	2,345	2,500
	Live Load L/360	741	1,075	1,483	*		*	339	366	597	697	1,112	1,613	2,225	*
	Min. End/Int. Bearing (in.)	2.6/6.6	3.4/8.5	4.2/10.5	4.5/11.3		1.5/3.5	1.5/3.5	1.5/3.5	1.6/4.0	1.9/4.7	2.6/6.6	3.4/8.5	4.2/10.5	4.5/11.2
16'-6"	Total Load	684	897	1,120	1,365			300	326	540	634	1,026	1,346	1,680	2,048
	Live Load L/360	465	680	945	1,263			209	227	371	435	698	1,020	1,418	1,895
	Min. End/Int. Bearing (in.)	2.2/5.5	2.9/7.2	3.6/8.9	4.4/10.9			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	2.2/5.5	2.9/7.2	3.6/8.9	4.4/10.9
18'-6"	Total Load	488	710	887	1,082			210	228	382	449	733	1,066	1,331	1,623
	Live Load L/360	335	491	686	922			149	162	266	311	502	737	1,030	1,383
	Min. End/Int. Bearing (in.)	1.8/4.4	2.6/6.4	3.2/8.0	3.9/9.7			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.8/4.4	2.6/6.4	3.2/8.0	3.9/9.7
20'	Total Load	387	573	756	922			164	178	300	354	580	860	1,134	1,384
	Live Load L/360	267	393	550	741			119	128	212	248	401	590	826	1,112
	Min. End/Int. Bearing (in.)	1.5/3.8	2.2/5.6	3.0/7.4	3.6/9.0			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.8	2.2/5.6	3.0/7.4	3.6/9.0
22'	Total Load	289	432	611	759			120	131	223	263	434	648	916	1,138
	Live Load L/360	202	298	419	566			89	97	160	187	304	448	629	850
	Min. End/Int. Bearing (in.)	1.5/3.5	1.9/4.7	2.6/6.6	3.3/8.2			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.9/4.7	2.6/6.6	3.3/8.2
24'	Total Load	221	332	471	634			89	98	168	199	332	498	707	951
	Live Load L/360	157	232	326	442			69	75	123	145	235	348	490	663
	Min. End/Int. Bearing (in.)	1.5/3.5	1.6/4.0	2.2/5.6	3.0/7.5			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.6/4.0	2.2/5.6	3.0/7.5
26'	Total Load	172	259	370	506			67	74	129	153	258	389	555	760
	Live Load L/360	124	183	259	351			54	59	97	114	186	275	388	527
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.9/4.8	2.6/6.5			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.9/4.8	2.6/6.5
28'	Total Load	135	205	294	405			51	56	100	120	203	308	442	607
	Live Load L/360	99	148	208	283			43	47	78	92	149	222	313	425
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.7/4.2	2.3/5.7			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.2	2.3/5.7
30'	Total Load	108	164	237	327					78	94	162	247	356	491
	Live Load L/360	81	120	170	232					63	75	122	181	256	348
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.5/3.7	2.0/5.0					1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.7	2.0/5.0

* Indicates Total Load value controls.

FRAMING CONNECTORS

Top Mount Hangers—USP Structural Connectors®

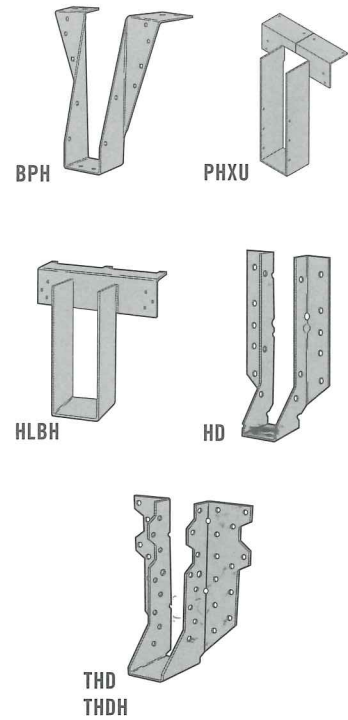
Supported Member Width	Supported Member Depth	Hanger	Nail Type		Allowable Load (lbs)—100% ⁽¹⁾		
					Support Member Material		
			Header	Joist	LSL, LVL, PSL	DF/SP	SPF
1 3/4"	9 1/4"	BPH17925	16d	10d x 1 1/2"	3,340	3,030	2,180
		PHXU17925	16d	10d x 1 1/2"	4,420	4,420	3,155
	9 1/2"	BPH1795	16d	10d x 1 1/2"	3,340	3,030	2,180
		PHXU1795	16d	10d x 1 1/2"	4,420	4,420	3,155
	11 1/4"	BPH17112	16d	10d x 1 1/2"	3,340	3,030	2,180
		PHXU17112	16d	10d x 1 1/2"	4,420	4,420	3,155
	11 7/8"	BPH17118	16d	10d x 1 1/2"	3,340	3,030	2,180
		PHXU17118	16d	10d x 1 1/2"	4,420	4,420	3,155
	14"	BPH1714	16d	10d x 1 1/2"	3,340	3,030	2,180
		PHXU1714	16d	10d x 1 1/2"	4,420	4,420	3,155
3 1/2"	9 1/4"	PHXU35925	16d	10d	5,785	5,285	3,590
	9 1/2"	PHXU3595	16d	10d	5,785	5,285	3,590
	11 1/4"	PHXU35112	16d	10d	5,785	5,285	3,590
	11 7/8"	PHXU35118	16d	10d	5,785	5,285	3,590
	14"	HLBH3514	NA16D-RS	16d	9,600	9,600	8,560
		HLBH3516	NA16D-RS	16d	9,600	9,600	8,560
	18"	HLBH3518	NA16D-RS	16d	9,600	9,600	8,560
		PHXU3520	16d	10d	5,785	5,285	3,590
20"	HLBH3520	NA16D-RS	16d	9,600	9,600	8,560	
5 1/4"	9 1/4"	PHXU55925	16d	10d	5,785	5,285	3,590
	9 1/2"	PHXU5595	16d	10d	5,785	5,285	3,590
	11 1/4"	PHXU55112	16d	10d	5,785	5,285	3,590
	11 7/8"	PHXU55118	16d	10d	5,785	5,285	3,590
	14"	HLBH5514	NA16D-RS	16d	9,600	9,600	8,560
		HLBH5516	NA16D-RS	16d	9,600	9,600	8,560
	18"	PHXU5518	16d	10d	5,785	5,285	3,590
		HLBH5518	NA16D-RS	16d	9,600	9,600	8,560
	20"	PHXU5520	16d	10d	5,785	5,285	3,590
		HLBH5520	NA16D-RS	16d	9,600	9,600	8,560
7"	11 7/8"	PHXU71118	16d	10d	5,785	5,285	3,590
	14"	HLBH7114	NA16D-RS	16d	9,600	9,600	8,560
	16"	HLBH7116	NA16D-RS	16d	9,600	9,600	8,560
	18"	HLBH7118	NA16D-RS	16d	9,600	9,600	8,560

(1) Maximum load for top mount hangers may not be increased for duration of load.

Face Mount Hangers—USP Structural Connectors®

Supported Member Width	Supported Member Depth	Hanger	Nail Type		Allowable Load (lbs)—100%		
					Support Member Material		
			Header	Joist	LSL, LVL, PSL	DF/SP	SPF
1 3/4"	9 1/4"–14"	HD17925	16d	10d x 1 1/2"	2,540 ⁽¹⁾	2,540 ⁽¹⁾	2,080 ⁽¹⁾
		THD179	16d	10d x 1 1/2"	5,360 ⁽¹⁾	5,360 ⁽¹⁾	4,210 ⁽¹⁾
	11 1/4"–14"	HD17112	16d	10d x 1 1/2"	2,870 ⁽¹⁾	2,870 ⁽¹⁾	2,080 ⁽¹⁾
		HD1714	16d	10d x 1 1/2"	3,100 ⁽¹⁾	3,100 ⁽¹⁾	2,280 ⁽¹⁾
3 1/2"	9 1/4"–14"	HD410	16d	10d	2,540 ⁽¹⁾	2,540 ⁽¹⁾	2,180 ⁽¹⁾
		THD410	16d	10d	5,360 ⁽¹⁾	5,360 ⁽¹⁾	4,600 ⁽¹⁾
	11 1/4"–18"	HD412	16d	10d	3,100 ⁽¹⁾	3,100 ⁽¹⁾	2,660 ⁽¹⁾
		THD412	16d	10d	6,770 ⁽¹⁾	6,770 ⁽¹⁾	5,810 ⁽¹⁾
		THDH412	16d	16d	9,845	9,845	8,270
		HD414	16d	10d	3,385 ⁽¹⁾	3,385 ⁽¹⁾	2,905 ⁽¹⁾
	14"–20"	THD414	16d	10d	7,045	7,045	5,920
		THDH414	16d	16d	9,845	9,845	8,270
5 1/4"	9 1/4"–11 7/8"	HD5210	16d	10d	2,540 ⁽¹⁾	2,540 ⁽¹⁾	2,180 ⁽¹⁾
		THD610	16d	10d	5,660 ⁽¹⁾	5,660 ⁽¹⁾	4,900 ⁽¹⁾
	THDH610	16d	16d	8,725 ⁽¹⁾	8,725 ⁽¹⁾	7,520 ⁽¹⁾	
	11 1/4"–16"	THDH612	16d	16d	9,935	9,935	8,345
	11 1/4"–18"	THD612	16d	10d	7,150 ⁽¹⁾	7,150 ⁽¹⁾	6,190 ⁽¹⁾
		THD614	16d	10d	8,415	8,415	7,070
14"–20"	THDH614	16d	16d	11,645	11,645	9,780	
7"	9 1/4"–14"	HD7100	16d	10d	1,690 ⁽¹⁾	1,690 ⁽¹⁾	1,450 ⁽¹⁾
		THDH7210	16d	16d	8,260 ⁽¹⁾	8,260 ⁽¹⁾	7,120 ⁽¹⁾
	11 1/4"–16"	HD7120	16d	10d	2,255 ⁽¹⁾	2,255 ⁽¹⁾	1,935 ⁽¹⁾
		THDH7212	16d	16d	9,845	9,845	8,270
	14"–18"	HD7140	16d	10d	2,820 ⁽¹⁾	2,820 ⁽¹⁾	2,420 ⁽¹⁾
THDH7214		16d	16d	9,845	9,845	8,270	

(1) Value may be increased for duration of load.



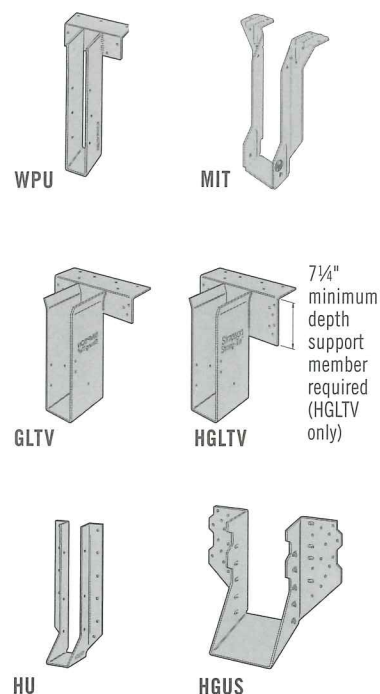
See General Notes on page 40

FRAMING CONNECTORS

Top Mount Hangers—Simpson Strong-Tie®

Supported Member Width	Supported Member Depth	Hanger	Nail Type		Allowable Load (lbs)—100% ⁽¹⁾		
			Header	Joist	Support Member Material		
					LSL, LVL, PSL	DF/SP	SPF
1 3/4"	9 1/4"	WPU1.81/9.25	16d	10d x 1 1/2"	3,650	4,165	4,165
		LBV1.81/9.25	16d	10d x 1 1/2"	2,885	2,590	2,060
	9 1/2"	MIT9.5	16d	10d x 1 1/2"	2,115	2,305	1,665
		LBV1.81/9.5	16d	10d x 1 1/2"	2,885	2,590	2,060
	11 1/4"	WPU1.81/11.25	16d	10d x 1 1/2"	3,650	4,165	4,165
		LBV1.81/11.25	16d	10d x 1 1/2"	2,885	2,590	2,060
3 1/2"	9 1/4"	HB3.56/9.25	16d	16d	5,640	5,650	3,820
		HB3.56/9.5	16d	16d	5,640	5,650	3,820
	11 1/4"	HB3.56/11.25	16d	16d	5,640	5,650	3,820
		HB3.56/11.88	16d	16d	5,640	5,650	3,820
	14"	GLTV3.514	16d	16d	5,750	7,000	5,145
		GLTV3.516	16d	16d	5,750	7,000	5,145
18"	HGLTV3.518	16d	16d	9,000	8,665	6,770	
	HGLTV3.520	16d	16d	9,000	8,665	6,770	
5 1/4"	9 1/4"	GLTV5.50/9.25	16d	16d	5,750	7,000	5,145
		GLTV5.59	16d	16d	5,750	7,000	5,145
	11 1/4"	GLTV5.50/11.25	16d	16d	5,750	7,000	5,145
		HGLTV5.511	16d	16d	9,000	8,665	6,770
	14"	EGQ5.50-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—
		EGQ5.50-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—
18"	EGQ5.50-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—	
	EGQ5.50-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—	
7"	11 1/8"	EGQ7.25-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—
		EGQ7.25-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—
	14"	EGQ7.25-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—
		EGQ7.25-SDS3	SDS 1/4" x 3"	SDS 1/4" x 3"	18,680	—	—

(1) Maximum load for top mount hangers may not be increased for duration of load.



Hanger information on these two pages was provided by either Simpson Strong-Tie® or USP Structural Connectors®. For additional information, please refer to their literature.

Face Mount Hangers—Simpson Strong-Tie®

Supported Member Width	Supported Member Depth	Hanger	Nail Type		Allowable Load (lbs)—100%		
			Header	Joist	Support Member Material		
					LSL, LVL, PSL	DF/SP	SPF
1 3/4"	7 1/4"–9 1/2"	HU7	16d	10d x 1 1/2"	1,610 ⁽¹⁾	1,610 ⁽¹⁾	1,390 ⁽¹⁾
		HU11	16d	10d x 1 1/2"	2,950 ⁽¹⁾	2,950 ⁽¹⁾	2,550 ⁽¹⁾
	11 1/4"–14"	HUS1.81/10	16d	16d	4,900	4,900	4,355
3 1/2"	7 1/4"–11 1/4"	HHUS48	16d	16d	3,885	3,885	3,275
		HHUS410	16d	16d	5,190	5,190	4,385
	9 1/2"–18"	HGUS410	16d	16d	8,780	8,780	7,365
		HGUS414	16d	16d	10,015	10,015	7,890
5 1/4"	9 1/4"–11 1/8"	HHUS5.50/10	16d	16d	5,190	5,190	4,385
		HGUS5.50/12	16d	16d	9,155	9,155	7,690
	14"–20"	HGUS5.50/14	16d	16d	10,015	10,015	8,415
		HGU5.50	SDS 1/4" x 2 1/2"	SDS 1/4" x 2 1/2"	14,145	14,145	10,185
7"	9 1/4"–11 1/8"	HGUS7.25/10	16d	16d	8,780	8,780	7,595
		HGUS7.25/12	16d	16d	9,835	9,835	8,260
	11 1/4"–16"	HGU7.25	SDS 1/4" x 2 1/2"	SDS 1/4" x 2 1/2"	14,145	14,145	10,185
		HGUS7.25/14	16d	16d	11,110	11,110	9,330
14"–20"	HHGU7.25	SDS 1/4" x 2 1/2"	SDS 1/4" x 2 1/2"	17,845	17,845	12,850	

(1) Value may be increased for duration of load.

General Notes

- Hanger capacity may be more or less than that of the supported member; therefore, check both the hanger and the beam capacities.
- Leave 1/16" clearance (1/8" maximum) between the end of the beam or header and its support member or hanger.

Header Assumptions

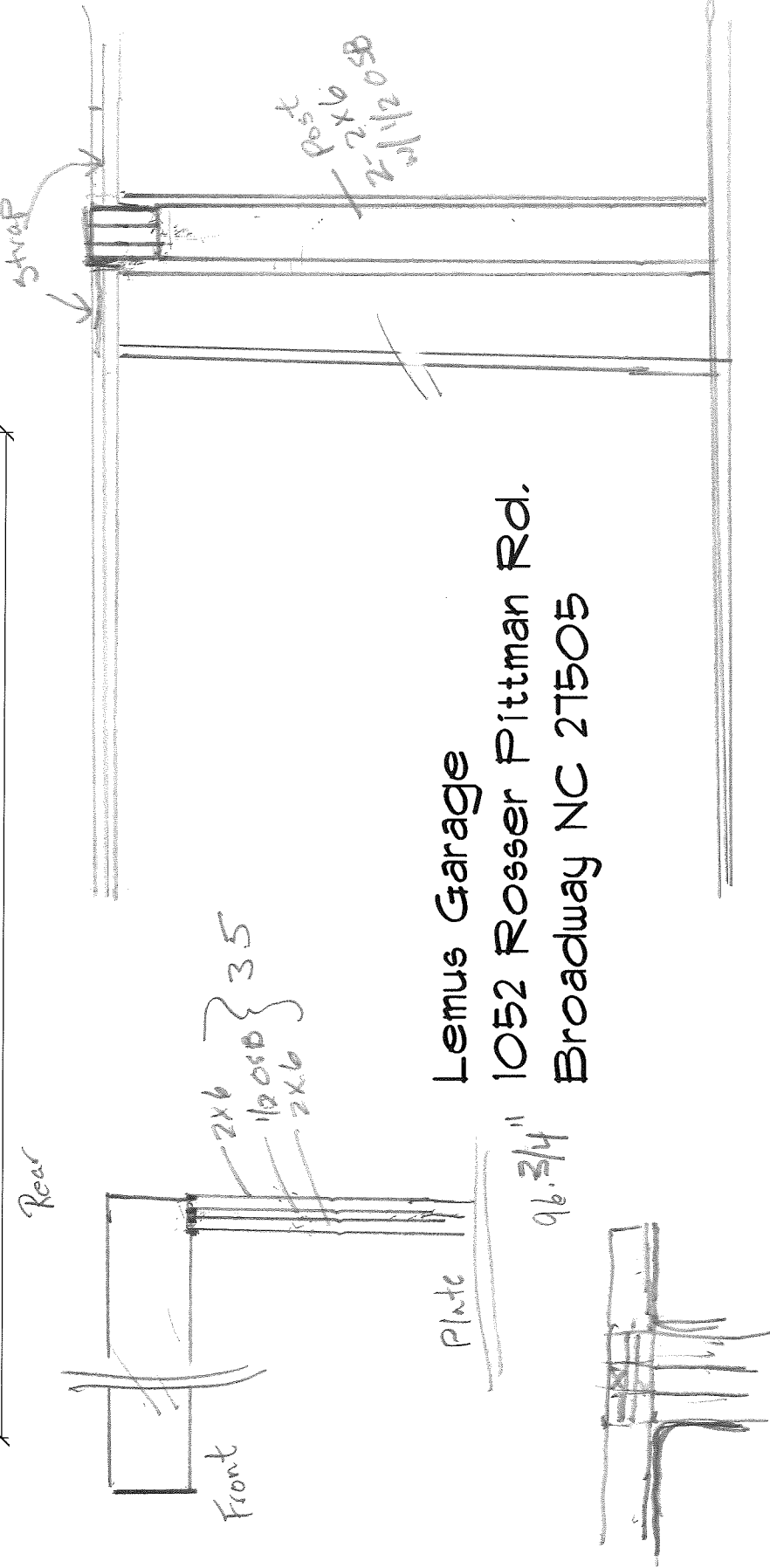
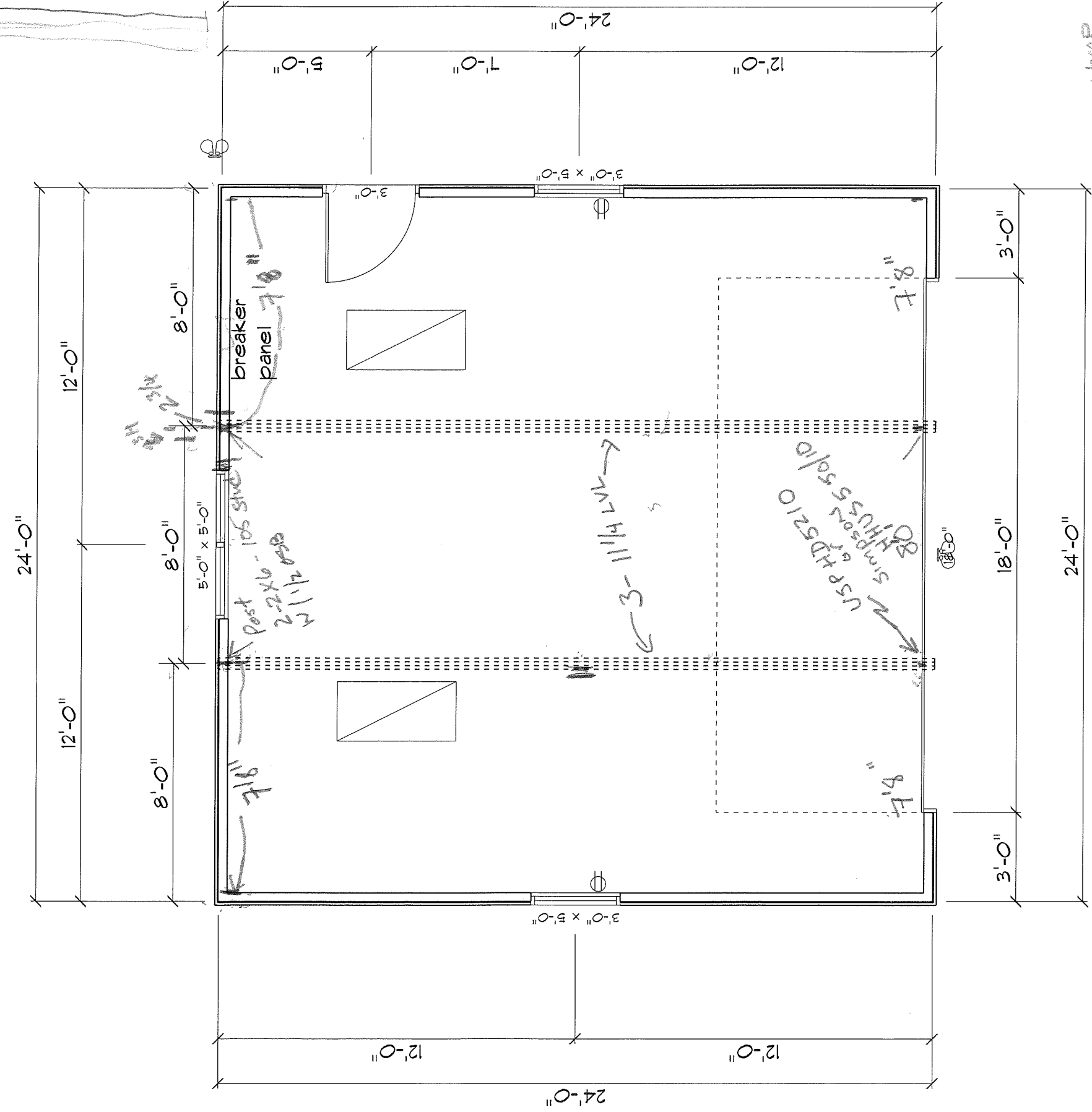
- Hangers to be supported by headers of TimberStrand® LSL, Microllam® LVL, Parallam® PSL, Douglas fir, southern pine, or spruce-pine-fir.
- When using top mount hangers in back-to-back applications, ensure that the supporting beam width is adequate to prevent hanger interference.

- Face mount hangers to be supported by 1 3/4" width headers, minimum.

Nailing Requirements

- Fill all round and positive-angle nail holes with the proper nails.
 - 10d x 1 1/2" nails are 0.148" dia. by 1 1/2" long.
 - 10d nails are 0.148" dia. by 3" long.
 - 16d nails are 0.162" dia. by 3 1/2" long.
 - For USP: 16d R.S. nails are (9 gauge) 0.148" dia. by 3 1/2" long ring-shank nails.

- 6-24' 1 1/4" LVLs
- 4-2x6x105 studs
- 1-OSB
- 4 USP HD5210 Hangers
- 1-Roll Sheathing



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