December 12, 2023 Project No. 23-2778

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Mark Guthrie
Highland Construction
1409 Clinton Rd
Fayetteville, NC 28312

Re: Structural Observation — *458 Jamestown Dr, Spring Lake, NC 28390*

Mr. Guthrie,

At your request, on November 29, 2023 we performed a visual structural observation of damaged roof framing from a reported tree impact at the Spring Lake residence noted above. The structure is a double wide manufactured home over a pier/curtain wall with interior masonry piers *(see picture 1).*

Our observations are listed below. Indicators such as "left," "right," "front," and "back" are referenced as viewing the front of the home.

TREE IMPACT DAMAGE

- Investigation from within the home revealed that the following roof members were damaged *(see pictures 2-7 for examples):*
  - Along the back right truss bay of the home within the back bedroom/bathroom, the 1st-6th trusses from the left were broken.
    - Roof sheathing near the above noted trusses.
  - Along the front truss bay within the kitchen/dining room, the 1st truss from the left was broken member.
  - Numerous small portions of roof sheathing where tree branches had impacted the roof.
- The exterior wall at the back left of the home was visibly out of plumb.
  - Measurement by laser plumb indicated that the above noted wall had an interior lean by as much as approximately ½" over a small section of the wall.

We recommend the following work be performed by a qualified general contractor (numbering does not indicate priority):

1) Remove and replace the above noted (7) broken or damaged trusses. The design of new trusses should be performed by a qualified truss manufacturer.
   a) Sheathe the new portion of the roof with sheathing of matching thickness, fastened to roof framing members with 8d common nails at 6" o.c. at panel boundaries, and 12" o.c. to rafters within the panel field. Splice panels over centerlines of rafters as needed with 1/8" minimum edge nail distance. No section of new or remaining sheathing should be smaller than 2'-0" in any direction.

2) Areas of punctured roof sheathing should be reinforced with ¾" plywood tight-fit to the underside of roof sheathing. Secure plywood with 2x4 ledgers securely fastened to parallel truss elements *(see detail 1).*
3) Remove and replace the damaged sections of the back left stud wall matching existing construction.
    a) Any section of removed wall sheathing should be replaced with sheathing of matching thickness, fastened to wall framing members with 8d common nails at 6" o.c. at panel boundaries, and 12" o.c. to studs within the panel field. Splice panels over centerlines of wall studs as needed with 1/8" minimum edge nail distance. No section of new or remaining sheathing should be smaller than 2'-0" in any direction.

The above-listed determinations were made in accordance with common engineering principles and the intent of the 2018 edition of the *North Carolina Residential Building Code.* Sequencing, and means and methods of construction are considered to be beyond the scope of this report. Contractor is to provide adequate temporary shoring prior to cutting or removing any structural load-bearing elements. All work is to conform to applicable provisions of current building standards. Please feel free to contact us, should you have any questions or concerns regarding this matter.

Sincerely,
W. Harrison Welch, PE
Stonewall Structural Engineering, PLLC
Lic. #P–0951

PICTURE ADDENDUM

Picture 1 – 458 Jamestown Dr, Spring Lake, NC 28390

Picture 2 – Example of broken trusses in the back left bay of the home

Picture 3 – Example of broken trusses in the back left bay of the home

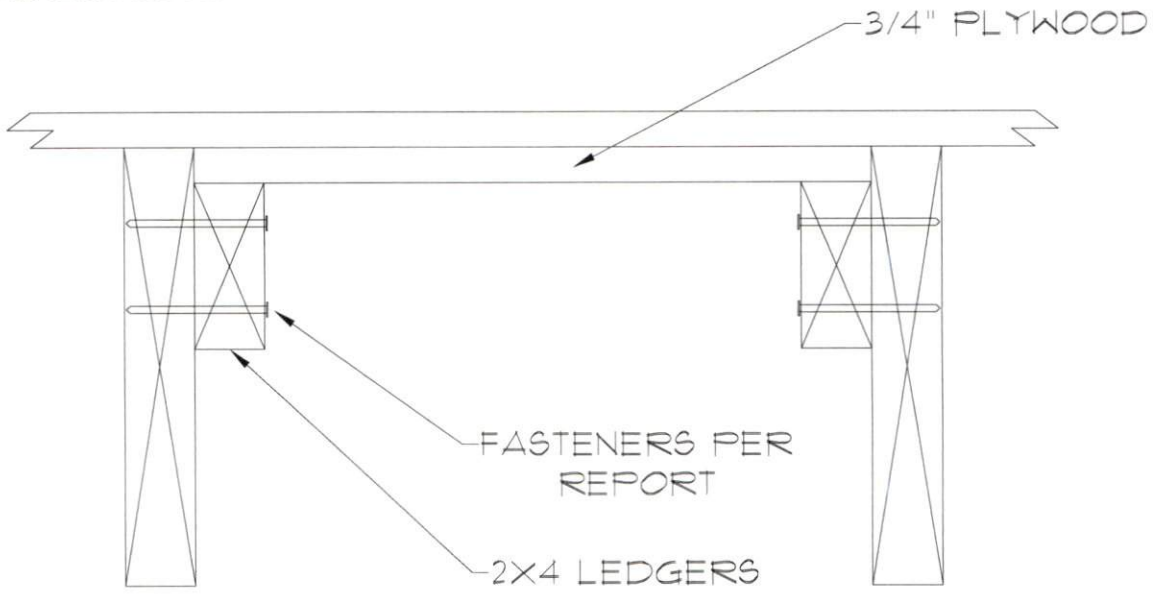
Picture 4 – Example of broken trusses in the back left bay of the home

Picture 5 – Example of a damaged truss member in the front left bay of the home

Picture 6 – Example of a damaged truss member in the front left bay of the home

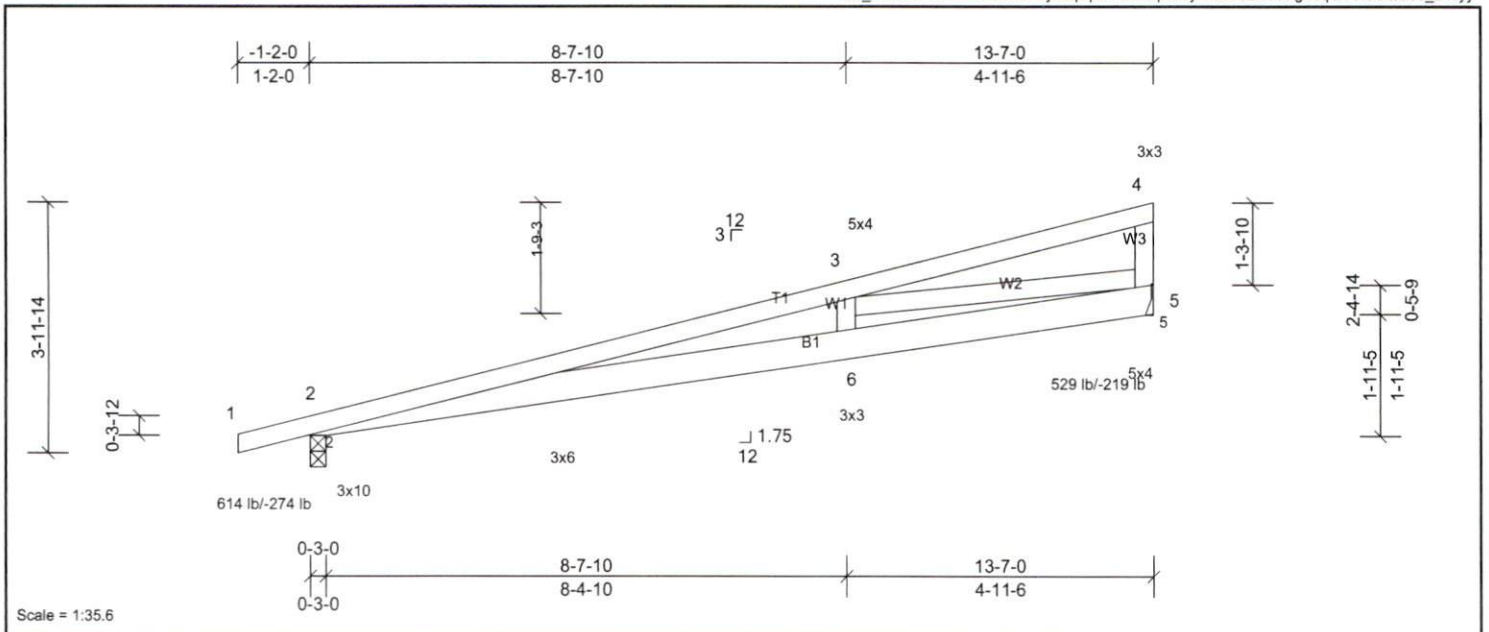
Picture 7 – Example of truss members not properly connected to the gusset plate

DETAIL ADDENDUM



Detail 1 – Roof Sheathing Reinforcement

Job	Truss	Truss Type	Qty	Ply	
24012133	T1	Truss	13	1	Job Reference (optional)



Scale = 1:35.6

Plate Offsets (X, Y): [2:0-2-3,Edge]

Loading	(psf)	Spacing	2-0-0	CSI		DEFL	in	(loc)	l/defl	L/d	PLATES	GRIP
TCLL (roof)	20.0	Plate Grip DOL	1.15	TC	0.47	Vert(LL)	0.27	6-8	>587	240	MT20	244/190
TCDL	10.0	Lumber DOL	1.15	BC	0.98	Vert(CT)	-0.38	6-8	>417	180		
BCLL	0.0 *	Rep Stress Incr	YES	WB	0.91	Horz(CT)	0.03	5	n/a	n/a		
BCDL	10.0	Code	IRC2015/TPI2014	Matrix-MSH							Weight: 64 lb	FT = 20%

LUMBER

TOP CHORD	2x4 SP No.2
BOT CHORD	2x6 SP No.2
WEBS	2x4 SP No.3

BRACING

TOP CHORD	Structural wood sheathing directly applied or 3-5-5 oc purlins, except end verticals.
BOT CHORD	Rigid ceiling directly applied or 2-2-0 oc bracing.

REACTIONS (lb/size) 2=614/0-3-0, (min. 0-1-8), 5=529/ Mechanical, (min. 0-1-8)
Max Horiz 2=167 (LC 6)
Max Uplift 2=-274 (LC 6), 5=-219 (LC 10)

FORCES (lb) - Max. Comp./Max. Ten. - All forces 250 (lb) or less except when shown.

TOP CHORD	2-3=-2088/1072
BOT CHORD	2-6=-1112/2054, 5-6=-1105/2054
WEBS	3-6=0/288, 3-5=-1931/1063

NOTES

1) Wind: ASCE 7-10; Vult=155mph (3-second gust) Vasd=123mph; TCDL=6.0psf; BCDL=6.0psf; h=25ft; Cat. II; Exp B; Enclosed; MWFRS (envelope) exterior zone and C-C Exterior (2) zone; cantilever left and right exposed ; end vertical left and right exposed;C-C for members and forces & MWFRS for reactions shown; Lumber DOL=1.60 plate grip DOL=1.60
2) This truss has been designed for a 10.0 psf bottom chord live load nonconcurrent with any other live loads.
3) * This truss has been designed for a live load of 20.0psf on the bottom chord in all areas where a rectangle 3-06-00 tall by 2-00-00 wide will fit between the bottom chord and any other members.
4) Refer to girder(s) for truss to truss connections.
5) Bearing at joint(s) 2 considers parallel to grain value using ANSI/TPI 1 angle to grain formula. Building designer should verify capacity of bearing surface.
6) Provide mechanical connection (by others) of truss to bearing plate capable of withstanding 219 lb uplift at joint 5 and 274 lb uplift at joint 2.
7) This truss is designed in accordance with the 2015 International Residential Code sections R502.11.1 and R802.10.2 and referenced standard ANSI/TPI 1.

LOAD CASE(S) Standard