Farabaugh Engineering and Testing Inc.

Project No. T127-25

Report Date: January 21, 2025

No. Pages: 9 (inclusive)

UL 580 / UL1897 UPLIFT RESISTANCE TESTING

GEORGIA RIB ROOF PANEL
36" WIDE X 29 GA STEEL
(OVER 19/32" OSB)

FOR

GEORGIA METALS, INC.
539 GENERAL DANIELS AVE. NORTH
DANIELSVILLE, GA 30633

Prepared by:

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1/21/25

DANIEL G. FARABAUGH LICENSE No 48349 STATE OF FLORIDA PROFESSIONAL ENGINEER

Approved by:

Daniel G. Farabaugh, PE

ISO 17025

MIAMI-DADE COUNTY DADE COUNTY ACCREDITED LABORATORY

AAMA ACCREDITED LABORATORY

TDI TEXAS ACCREDITED LABORATORY

Community Affairs FLORIDA ACCREDITED LABORATORY & QC ENTITY

Purpose

This test method covers the evaluation of uplift resistance of roof assemblies per UL 580-06, rev. 2018 and UL 1897-12, rev. 2015 and as provided herein.

Test Specimen

Manufacturer: Georgia Metals, Inc.
539 General Daniels Ave. N.
Danielsville, GA 30633

Specimen: Georgia Rib Metal Roof Panel, 36" wide (Coverage), 29 ga steel

Substrate: 19/32" APA OSB (0.579" thick)
Span Rating: 24/16
Exposure 1
Level 11

Testing Apparatus

Test Chamber: The test chamber consists of three sections: a top section to create a uniform vacuum, a center section in which the roof assembly is constructed, and a bottom section to create a uniform positive pressure.

Pressure Chamber: The air pressure in the pressure chamber was measured at five points. Each of four points were located 42" from chamber corners at a 45 degree angle, with the fifth tube located 18" from the center of the air inlet opening. The end of each tube was 7" above the chamber floor. The tubes were connected to a manifold that, in turn was connected to a manometer.

Vacuum Chamber Measurement: The air pressure in the vacuum chamber was measured at five points. Each of four points was located 18" from chamber corners at a 45 degree angle and 8" above the chamber floor. The fifth tube located 12" from the center of the exhaust opening and 6" below the opening. The tubes were connected to a manifold that, in turn was connected to a manometer. The pressure in the vacuum chamber was controlled by an automatic damper. The damper door was moved by means of an air motor hooked to an air line and controlled by pressure switches located in the control console. An additional pressure line from the manifold to pressure switches controlled the automatic damper.

Installation

- The 19/32" OSB wood deck substrate was attached to the wood joists (2 x 10) supports (spaced at 2'-0" o.c.) using 8d ring shank nails at 6" on center around the perimeter and at interior supports.

- The metal roof panels were attached into the wood deck substrate using #10 X 1-1/2" long, hex head, Wood Binder screws with 7/16" dia. seal washer spaced as shown on the attached drawings.

- A plastic barrier was located between the panels and the underlying substrate.

Test Procedure

- The test assembly was subjected to positive and negative pressures to form an uplift pressure at the values and time duration per UL 580 as shown in the attached table.

- Vertical movement of the assembly during the tests was recorded.

- Subsequent to the completion of Phase 5 of the Class 90 test sequence, the test specimen was subjected to higher static uplift pressures per UL 1897 as shown on the attached table. The positive uplift pressure supplied from below was maintained at 48.5 psf while the negative uplift pressure supplied from above was increased in increments until failure or the desired uplift pressure was obtained.

TEST #1
UL 580 UPLIFT TEST

Test Date: 1/8/2025
Test Specimen: Georgia Rib Metal Roof Panel, 36" wide X 29 ga
Fastener Spacing: 1'-6" oc.

Class 30 Deflection Measurements

Phase	Time Duration (min.)	Negative Pressure (psf)	Positive Pressure (psf)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
Initial	0	0	0	5-1/16	5-1/4	5-0	5-3/16
1	5	16.2	0	5-1/16	5-1/4	4-15/16	5-1/8
2	5	16.2	13.8	5-0	5-1/8	4-13/16	5-0
3	60	8.1 – 27.7*	13.8	4-15/16	5-1/8	4-3/4	4-15/16
4	5	24.2	0	5-0	5-1/8	4-13/16	5-0
5	5	24.2	20.8	4-15/16	5-1/16	4-3/4	4-7/8

Class 60 Deflection Measurements

Phase	Time Duration (min.)	Negative Pressure (psf)	Positive Pressure (psf)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
1	5	32.3	0	5-0	5-1/8	4-13/16	4-15/16
2	5	32.3	27.7	4-7/8	5-0	4-5/8	4-13/16
3	60	16.2 – 55.4*	27.7	4-13/16	5-0	4-9/16	4-11/16
4	5	40.4	0	4-15/16	5-1/16	4-11/16	4-13/16
5	5	40.4	34.6	4-13/16	4-15/16	4-1/2	4-11/16

Class 90 Deflection Measurements

Phase	Time Duration (min.)	Negative Pressure (psf)	Positive Pressure (psf)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
1	5	48.5	0	4-7/8	5-0	4-5/8	4-13/16
2	5	48.5	41.5	4-3/4	4-7/8	4-7/16	4-5/8
3	60	24.2 – 48.5*	41.5	4-3/4	4-7/8	4-7/16	4-5/8
4	5	56.5	0	4-7/8	5-0	4-1/2	4-11/16
5	5	56.5	48.5	4-3/4	4-13/16	4-5/16	4-1/2

* Oscillation frequency as specified in UL 580.
Results: Upon completion of the above loading, there were no specimen failures.

TEST #1 (cont.)

UL 1897 UPLIFT TEST

Test Date: 1/8/25
Test Specimen: Georgia Rib Metal Roof Panel, 36" wide X 29 ga
Fastener Spacing: 1'-6" oc.

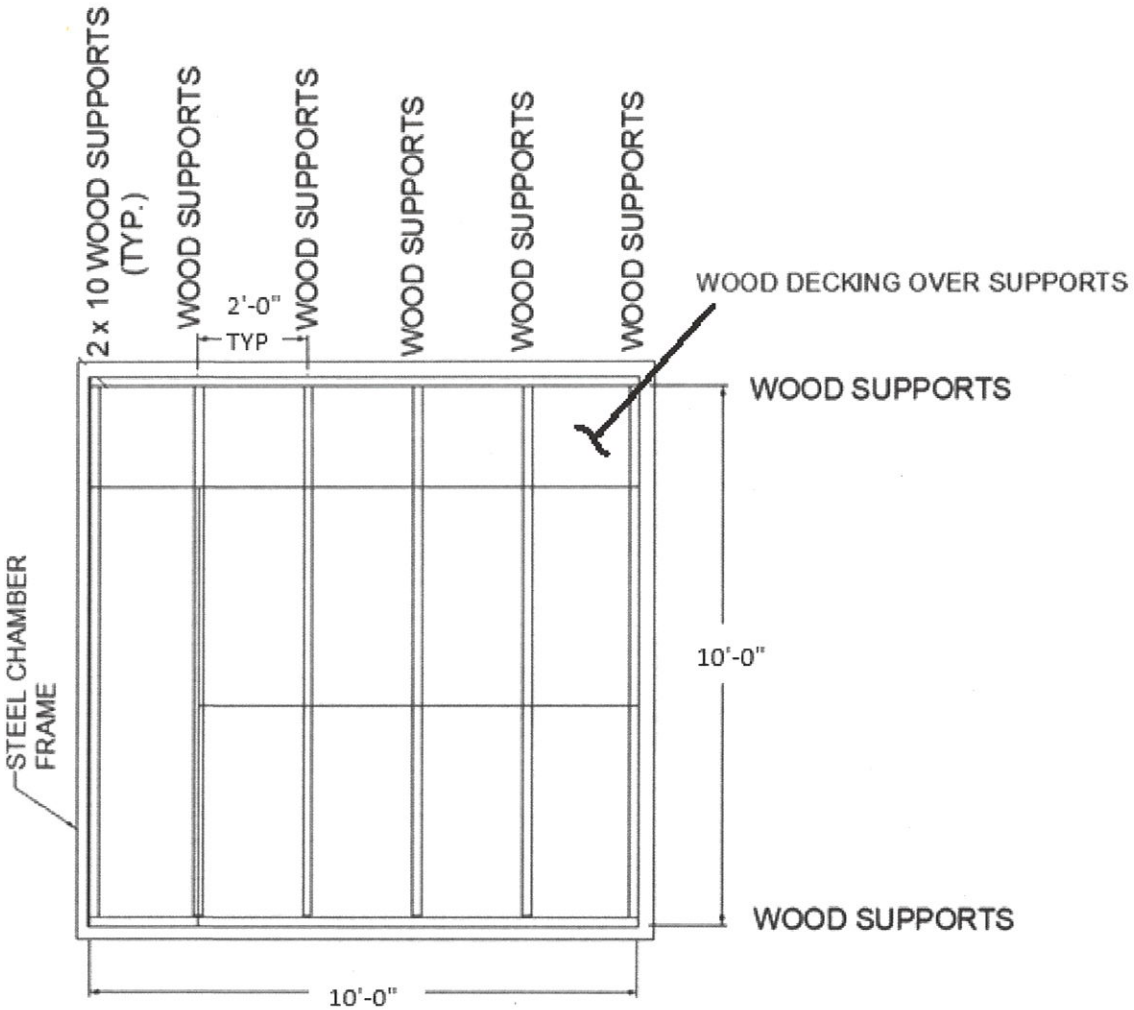
Deflection Measurements

Total Uplift Pressure (psf)	Time Duration (min.)	#1 (in)	#2 (in)	#3 (in)	#4 (in)
112	1	4-5/8	4-3/4	4-1/4	4-7/16

Results:

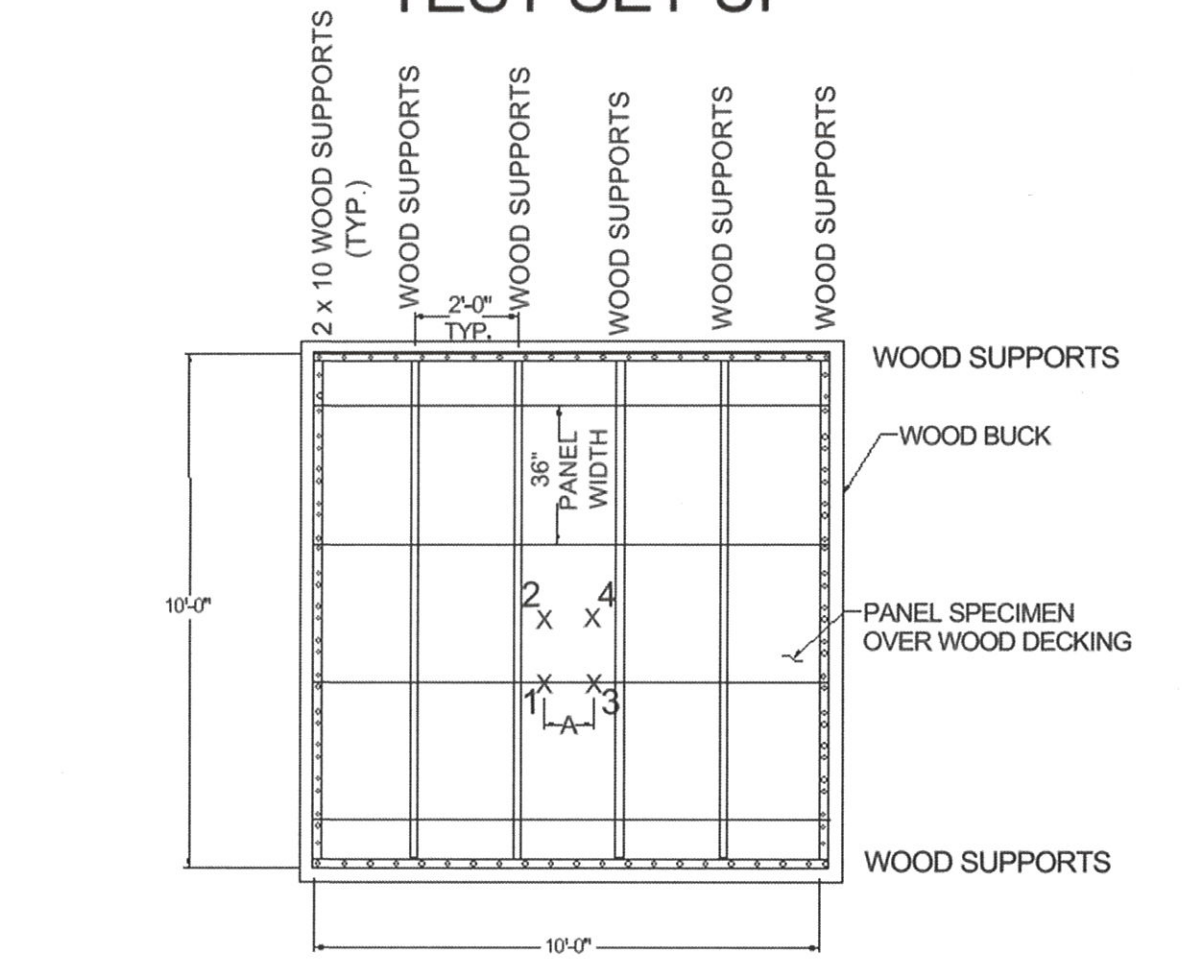
Maximum Total Uplift Pressure (sustained for 1 min.) = 112 psf

Maximum Total Uplift Test Pressure = 113.4 psf (Panel fasteners pulled out of OSB.)



PLAN VIEW OF WOOD DECKING & SUPPORTS

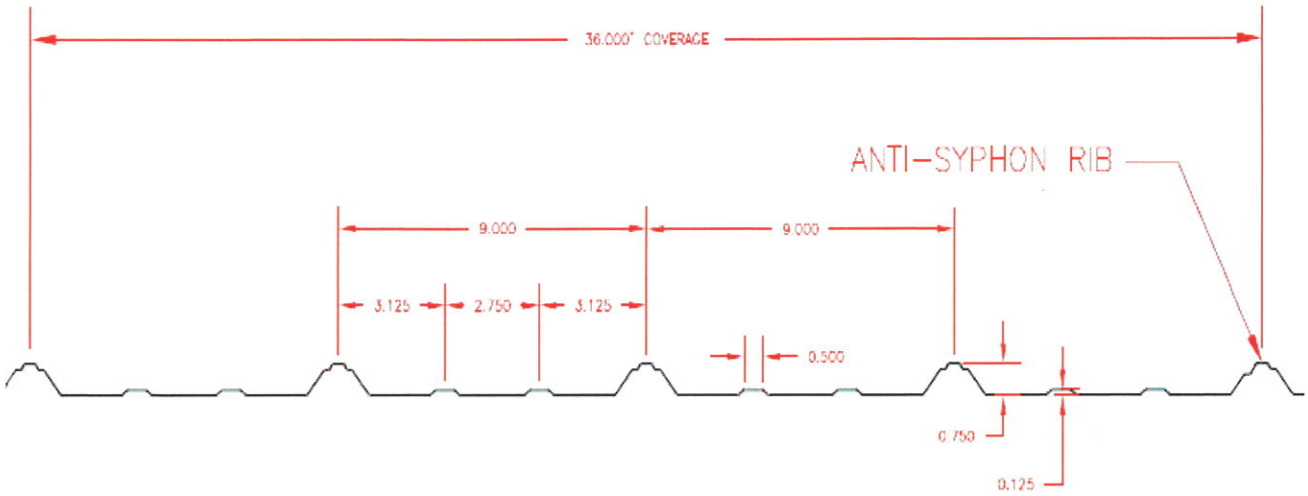
TEST SET UP



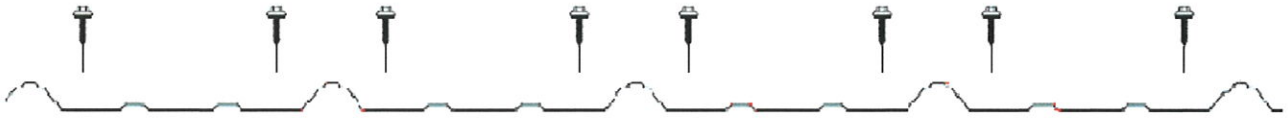
NOTE:- DEFECTION POINT #1 AT FASTENER LOCATION
A = FASTENER LOCATION / 2

X# - DEFLECTION LOCATION

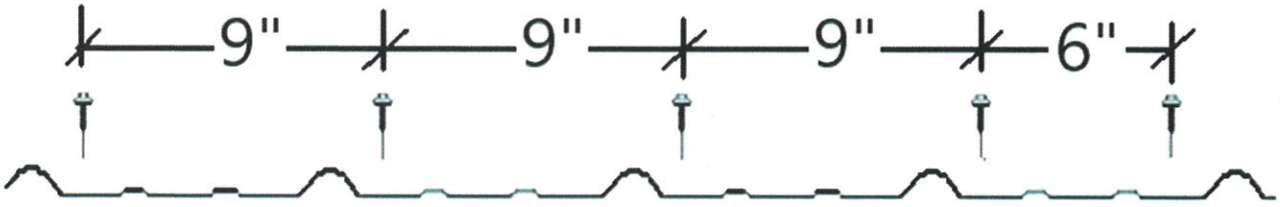
PLAN VIEW OF PANELS



PANEL DETAIL



FASTENING DETAIL AT
FIXED END INTO PURLIN



FASTENING DETAIL AT
INTERIOR PURLINS

Project No. T127-25

TENSILE TEST REPORT

Manufacturer: Georgia Metals, Inc.
539 General Daniels Ave. N.
Danielsville, GA 30633

Panel: Georgia Rib Metal Roof Panel, 36" wide (Coverage), 29 ga steel

Test Date: July 15, 2024

Test Method: ASTM A370-10

Sample No.	Width (in)	Thickness (in)	Yield Load (lb)	Max. Load (lb)	0.2% Offset Yield Strength (psi)	Tensile Strength (psi)	Elongation (% in 2 inches)
24055	0.503	0.012	720.8	740.87	119,417	122,743	1.5

Equipment Used: Tensile Machine #QT7-061196-020
Caliper #1074379
Extensometer #10311744D
Micrometer #110596927