element

EAR-CONTROLLED DATA

Report Number: ESP044689P.1

Test Dates: July 30th -July 31st 2025
Report Date: September 2, 2025
Author: Richard B. Luna

STRUCTURAL PERFORMANCE TEST REPORT

NAME OF MANUFACTURER: **The Williams Brothers Corp. Of America**
1330 Progress Drive
Front Royal, VA 22630

CONTACT PERSON: **Mr. Marcus Williams**

PRODUCT TYPE: Steel Roof Hatch / Single Door **MODEL:** WB RH/WB RH-AL (48 x 48)

Standard/Specifications	Summary
Dade County Protocol TAS 201-94	Large Missile Impact
Dade County Protocol TAS 202-94	+30 psf Water Penetration/ +/- 50 psf Design Pressure
Dade County Protocol TAS 203-94	± 50 psf Design Pressure

CONFIGURATION: One (1) Operable Steel Roof Hatch

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PRODUCT IDENTIFICATION

Model:	William Brothers WB RH/WB RH-AL
Curb Size:	48.00” wide x 48.00” long
Configuration:	Single Door Roof Hatch
Finish:	Steel
Performance Class: N/A	+30 psf Water Penetration Test +/-50 psf Design Pressure

PRODUCT DESCRIPTION

Curb Construction: Curb shall be 14 ga. (G 90) galvanized steel with durable re-coat able gray primer finish standard. Curb shall be 12” (304mm) in height with a 4” (101mm) fiber board insulation and mounting holes for roof attachment. Curb shall have integral cap flashing of the same material and thickness as the curb. Curb and cap flashing shall be fully welded at the corners for a watertight construction. Hinges are two-piece formed steel, with a non-removable heavy-duty pivot pin.

Cover Construction: Cover shall be 14 ga. (G 90) galvanized steel, with radius corners for safety, and shall be fully welded at the corners for watertight construction. An extruded rubber gasket, mechanically fastened to the inside of the lid, shall cause the hatch lid to seal.

Weatherstrip Description:
Weather Resistant Weather-Strip

Hardware Description:

Hardware shall include interior handle, with a positive, one-point locking mechanism, exterior handle, and provisions for padlock, both inside and out. Pre-lubricated compression springs, encased in zinc-plated telescopic tubes, for smooth and controlled door operation at any position. An automatic, hold-open arm, with vinyl grip, shall be standard. All hardware shall be corrosion resistant, and all fasteners shall be of a self-locking type Four lifting mechanisms was located in the left side corner of the hinge side. It was fastened by multiple screws to the cover and to the frame. One hold open arm assembly was located on the left side of the hatch and it connected the cover to the frame. It was fastened by multiple screws and the arm slid back and forth in a track on the cover. See drawing for quantity of screws and hinges.

Installation: The specimen was placed onto a nominal 2 x 10 SPF wood test buck (4) screws on each side, (1) screw at the top and bottom in the center.

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SUMMARY OF TEST RESULTS

TEST METHOD	TEST CONDITIONS	TEST CONCLUSION
(TAS 202)	+30 Water Penetration + 50 and -50 psf Design Pressure	PASS
Large Missile Impact Test (TAS 201)	---	PASS
Cyclic Load Test (TAS 203)	+ 50 and -50 psf Design Pressure	PASS

TEST SEQUENCE:

a. Air Infiltration
b. Preload
c. Design Load
d. Water Penetration
e. Structural Load
f. Missile Impact
g. Positive Cyclic Load
h. Negative Cyclic load

TAS 202 TEST RESULTS:

Air Infiltration	psf	Infiltration Allowable	Actual Infiltration	Result
Infiltration	+6.24	.30 cfm/sqft	.13 cfm/sqft	Pass

No Deflection Taken

Positive Load	Time	Psf	Max Deflection	Result
½ Test Pressure	30 sec	25	N/A	
Design	30 sec	50	N/A	Pass

No Deflection Taken

Negative Load	Time	Psf	Max Deflection	Result
½ Test Pressure	30 sec	25	N/A	
Design	30 sec	50	N/A	Pass

Water Penetration	0^0 incline	Psf	Time	Result
		30	15 minute static	Pass

ASTM F 588 Forced Entry Test	ACTUAL	REQUIREMENT
Grade 10 Type B	No Entry	No Entry

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REMARKS:
The static load test was conducted according to the procedure outlined in ASTM E330. No signs of failure were observed in this specimen during the test. As such, this specimen was found to satisfy the uniform load test.

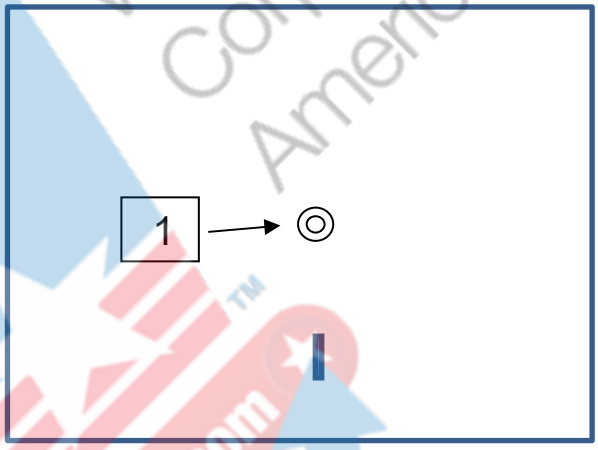
IMPACT TEST – DADE COUNTY MISSILE

Impact tests were conducted in accordance with DCBCCO TAS 201-94

Missile Species: #2 Southern Yellow Pine – Nominal 2 x 4
Missile Weight: 9.25 lbs
Missile Length: 90.125”
Conditioning Temperature: 68° – 71° F > 4 hours

TAS 202 TEST RESULTS Continued: #1

No Deflection measurements taken

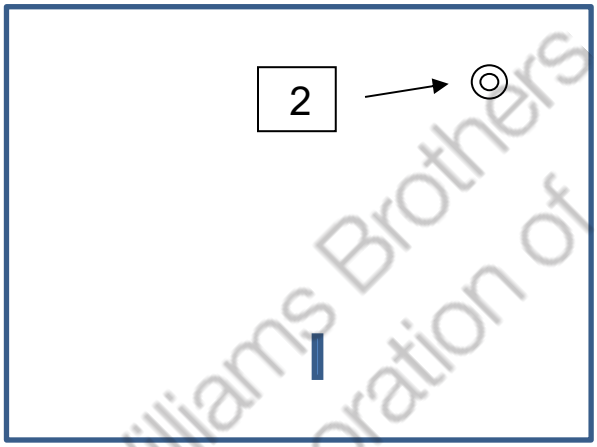


 # 1 Passed

EAR-CONTROLLED DATA

TAS 202 TEST RESULTS Continued: #2

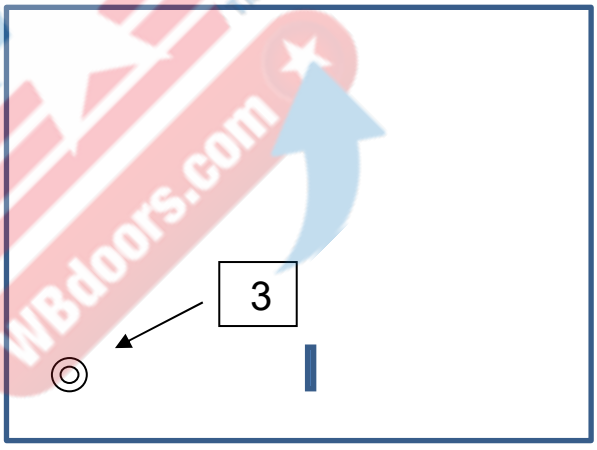
No Deflection measurements taken



 # 2 Passed

TAS 202 TEST RESULTS Continued: #3

No Deflection measurements taken



#3 Passed

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CYCLIC LOAD TEST:

CYCLIC TEST PRESSURE:
$(P_d)_{in}$ = P_{max} = 50 psf
$(P_d)_{out}$ = P_{max} = 50 psf

All Test Units

POSITIVE

# OF INWARD ACTING CYCLES/STAGE		
0 - 25 (psf) 600	0 - 32 (psf) 70	0 - 65 (psf) 1
1.1 Seconds	1.3 Seconds	2.0 Seconds

671 Cycles

NEGATIVE

# OF OUTWARD ACTING CYCLES/STAGE		
0 - 65 (psf) 1	0 - 32 (psf) 70	0 - 25 (psf) 600
2.3 Seconds	1.5 Seconds	1.3 Seconds

671 Cycles

1342 Cycles Completed

General Note: 2 mil plastic was required during the cycling test, but did not affect the test.

Remarks: All samples were inspected carefully upon completion of the cyclic test for failures. None were found. As such, this product was found to satisfy the cyclic test requirements.

TEST EQUIPMENT

Cannon: PVC tube utilizing compressed air to propel missile

Missile: 2 x 4 Southern Yellow Pine

Timing Device: Calibrated Radar Gun

Cycling Mechanism: Computer driven squirrel cage blower with electronic pressure measuring device

Deflection Measuring Device: N/A

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OFFICIAL OBSERVERS:

Rich Luna Element Materials Technology

TEST PROCEDURE:

The tests were conducted by Element Materials Technology located at 3922 Delaware Ave Des Moines, Iowa.

INDIVIDUAL PRODUCT IDENTIFICATION

TEST METHODS:

Air Leakage Resistance Test
ASTM E283/E283M-19, "Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen".

Water Penetration Resistance Test
ASTM: E547-00 (2024), "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference."

Uniform Load Deflection Test
E330/E330M-14(2021**)**, “Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference”.

Uniform Load Structural Test
E330/E330M-14(2021), "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference".

Forced Entry Resistance Test
ASTM: F588-17 (2023), "Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact

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REMARKS:

The above results were secured by using the designated test methods and they do indicate compliance with the performance requirements of the referenced specifications. This report does not constitute certification of this product which may only be granted by the Validator.

The samples will be held for a period of 30 days then disposed of.

Prepared By:

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The test results contained in this report pertain only to the specimens tested and not necessarily to all similar products.