

STRUCTURAL SOLUTIONS, P.A.*

Structural Engineering ■ Investigations ■ Consulting

GARAGE DOOR STATIC PRESSURE TEST REPORT

Garage Door No.:	IBC-2414-104-15		Test Date:	12/7/2017	Project No.:	17-096
Design Pressures:	+15.1 psf, -17.2 psf		Report Date:	10/29/2020	Model # 2400	
Test Pressures:	+22.7 psf, -25.8 psf		Test Location:	Entrematic, Winston-Salem, NC		
ASCE 7-16 Criteria:	Up to 5 Feet of Door Width in Zone 5; Roof Slope $\leq 10^\circ$; Enclosed Building					
	Exp. B, 30' MRH	Exp. C, 15' MRH	Exp. C, 25' MRH	Exp. D, 15' MRH	Exp. D, 25' MRH	
	135 mph	122 mph	116 mph	111 mph	106 mph	
Witnessed By:	Robert Richardson - Entrematic / Amarr; Thomas L. Shelmerdine, PE - Structural Solutions, P.A.					

Description of Test Specimen:

A 14'-2" wide x 8'-0" high sectional garage door, one section wide by four sections high, each section being 2" thick by 24" high 24 ga galvanized steel sheet. Each section was reinforced with 20 ga galvanized steel struts as follows: one 2" strut on the bottom & 3rd sections, and one 3" strut on the bottom, 2nd & top sections. The door sections were connected together with one 14 ga galvanized steel end hinge at each end stile and one 14 ga galvanized steel center hinge at 3 interior stiles as shown on the drawing. Model 2400 manufactured by Entrematic was used in the test. The test unit is further described on Drawing IBC-2414-104-15.

Manner of Testing:

This test was conducted at Entrematic, 165 Carriage Ct., Winston-Salem, NC, which is accredited by the American Association for Laboratory Accreditation, Certificate #2595.01. The specimen was tested for static pressure structural performance in substantial conformance with the procedures described in DASMA 108-12 and ASTM E330-14. Both positive and negative pressures were tested. The specimen was installed in an enclosure framed with welded structural steel and covered with 3/4" thick plywood. The door was covered with 2 mil plastic sheeting to prevent leakage of air pressure. One pressure blower was attached to the enclosure with flexible ducting to provide the positive and negative pressures. Pressure transducers connected to a computer were used to measure and record the pressures in the enclosure.

Test Procedure:

The specimen was subjected to the above pressures for the following durations. Positive pressure was applied on the exterior face of the door first, and then negative pressure was applied.

Step 1: Preload the door to 50% of the Design Pressure and hold for 10 seconds. Step 2: Unload the door for 1 to 5 minutes.
Step 3: Load the door to 100% of the Design Pressure and hold for 60 seconds. Step 4: Unload the door for 1 to 5 minutes.
Step 5: Load the door to 150% of the Design Pressure (which equals 100% of the Test Pressure) and hold for 10 seconds.
Step 6: Repeat 1 through 5 above for negative pressure.

Observations:

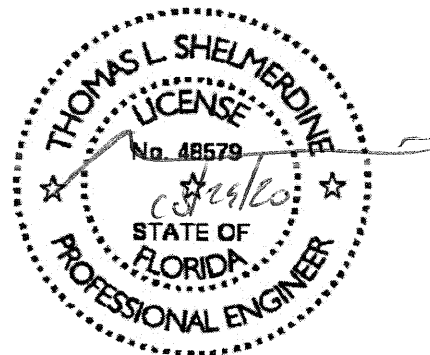
No failures occurred as a result of the noted loadings. The door remained operable after both positive and negative tests.

Summary:

The 14'-2"x8'-0" Model 2400 as described on drawing IBC-2414-104-15 meets or exceeds the testing criteria as described above. By comparison to the construction of the 14'-2"x8'-0" Model 2400, the following doors also meet or exceed the above testing criteria, when constructed in accordance with drawing IBC-2414-104-15:

- 14'-2"x8'-0" Model 2000 doors (which are constructed of thicker 20 gauge steel in lieu of 24 gauge steel)
- 14'-2"x8'-0" Amarr # 2402 and 2002 doors which are alternate model numbers for Models 2400 and 2000 respectively
- 14'-2"x8'-0" Amarr # 2412 and 2012 doors which are Models 2400 and 2000 with drop-in insulation
- 14'-2"x8'-0" Amarr # 2422 and 2022 doors which are Models 2400 and 2000 with drop-in insulation & steel backing inserts
- Model 2400, 2000, Amarr # 2402, 2412, 2422, 2002, 2012, 2022 doors with widths up to 14'-2" and heights up to 24'-0"
- 4 windows may be installed in 1 section (21 5/8" x 9 5/8" x 0.080" plexi-glass or 21 3/8" x 3 1/4" x 1/8" DSB)

Submitted By:



STRUCTURAL SOLUTIONS, P.A.* (*Florida: dba Structural Solutions of North Carolina, Inc., Firm #29412)

Thomas L. Shelmerdine, PE (NC PE #14654; Florida PE #0048579)

5921-G West Friendly Avenue ■ Greensboro, North Carolina 27410 ■ (336) 856-2686 ■ www.sspa.biz ■ NC Firm #C-1096