

STRUCTURAL SOLUTIONS, P.A.

Structural Engineering ■ Investigations ■ Consulting

GARAGE DOOR STATIC PRESSURE TEST REPORT

Garage Door No.:	IBC-2410-130-15		Test Date:	4/22/2014		Project No.:	12-088			
Design Pressures:	+24.1 psf, -28.1 psf		Report Date:	11/3/2020		Model #	2400			
Test Pressures:	+36.2 psf, -42.2 psf		Test Location:	Amarr Garage Doors, Winston-Salem, NC						
ASCE 7-16 Criteria:	Up to 5 Feet of Door Width in Zone 5; Roof Slope ≤ 10°; Enclosed Building									
	Exp. B, 30' MRH		Exp. C, 15' MRH		Exp. C, 25' MRH		Exp. D, 15' MRH		Exp. D, 25' MRH	
	168 mph		152 mph		145 mph		138 mph		133 mph	
Witnessed By:	Brandon Gentle - Amarr Garage Doors; Thomas L. Shelmerdine, PE - Structural Solutions, P.A.									

Description of Test Specimen:

A 10'-2" wide x 8'-0" high commercial steel sectional garage door, one section wide by four sections high, each section being 2" thick by 24" high 24 gauge galvanized steel sheet. Each section was reinforced with 2" or 3" 20 gauge galvanized steel struts; one of each on the bottom section, and alternating 2" and 3" struts (1 per section) on the other sections. The door sections were connected together with one 14 gauge galvanized steel end hinge at each end stile and one 14 gauge galvanized steel center hinge at 2 interior stiles as shown on the drawing. Garage door Model 2400 manufactured by Amarr Garage Doors was used in the test. The test unit is further described on Drawing IBC-2410-130-15.

Manner of Testing:

This test was conducted at Amarr Garage Doors in 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 "Standard Method for Testing Sectional Garage Doors - Determination of Structural Performance Under Uniform Static Air Pressure Difference", and ASTM E330 "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference". Both positive and negative pressures were tested. The specimen was installed in an enclosure measuring approximately 5' deep, 9' high, and 25' long. The enclosure was framed with shop welded structural steel square tubing 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:

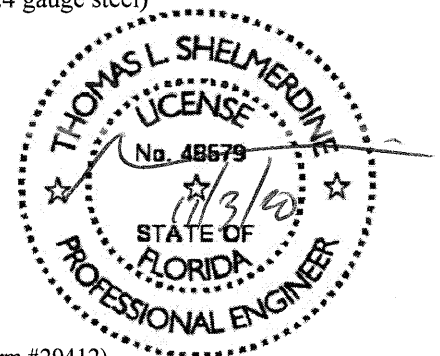
No failures occurred as a result of the noted loadings. The door remained operable after both positive and negative tests.

Summary:

A 10'-2"x8'-0" Model 2400 as described on drawing IBC-2410-130-15 meets or exceeds the testing criteria as described above. By comparison to the construction of the 10'-2"x8'-0" Model 2400, the following doors also meet or exceed the above testing criteria, when constructed in accordance with drawing IBC-2410-130-15:

- 10'-2" x 8'-0" Model 2000 doors (which are constructed of thicker 20 gauge steel in lieu of 24 gauge steel)
- Model 2000 and 2400 doors with widths up to 10'-2" and heights up to 24'-0"
- 3 windows may be installed in 1 section (21 5/8" x 9 5/8" x 0.080" plexiglass, 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 ■ Fax (336) 856-2687 ■ NC Firm #C-1096