

STRUCTURAL SOLUTIONS, P.A.

Structural Engineering ■ Investigations ■ Consulting

GARAGE DOOR STATIC PRESSURE TEST REPORT

Garage Door No.:	IRC-6009-120-15		Test Date:	2/8/2013		Project No.:	13-019			
Design Pressures:	+22.8 psf, -26.9 psf		Report Date:	10/30/2020		Model #	600			
Test Pressures:	+34.2 psf, -40.4 psf		Test Location:	Amarr Garage Doors, Winston-Salem, NC						
ASCE 7-16 Criteria:	Up to 5 Feet of Door Width in Zone 5; Any Roof Slope; Enclosed Building									
	Exp. B, 30' MRH		Exp. C, 15' MRH		Exp. C, 25' MRH		Exp. D, 15' MRH		Exp. D, 25' MRH	
	155 mph		141 mph		134 mph		128 mph		122 mph	
Witnessed By:	Brandon Gentle - Amarr Garage Doors; Thomas L. Shelmerdine, PE - Structural Solutions, P.A.									

Description of Test Specimen:

A 9'-0" wide x 7'-0" high residential steel sectional garage door, one section wide by four sections high, each section being 2" thick by 21" high 25 gauge galvanized steel sheet. Each section was reinforced with 20 gauge galvanized steel struts: the top section had one 2" strut; the intermediate sections each had one 3" strut; the bottom section had one 2" and one 3" strut. 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 one interior stile as shown on the drawing. Garage door Model 600 manufactured by Amarr Garage Doors was used in the test. The test unit is further described on Drawing IRC-6009-120-15.

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:

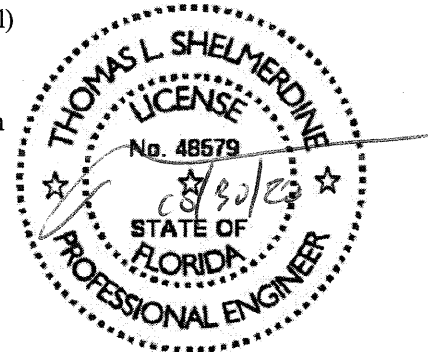
No failures occurred as a result of the noted loadings. The door remained operable after both positive and negative tests.

Summary:

A 9'-0"x7'-0" Model 600 as described on drawing IRC-6009-120-15 meets or exceeds the testing criteria as described above. By comparison to the construction of the 9'-0"x7'-0" Model 600, the following doors also meet or exceed the above testing criteria, when constructed in accordance with drawing IRC-6009-120-15:

- 9' x 7' Model 950 doors (which are constructed of thicker 24 gauge steel in lieu of 25 gauge steel)
- 9' x 7' Model 650 doors (which have the "Oak Summit" embossment pattern)
- 8' to 9' wide Model 600, 650 and 950 doors with heights of 6'-6" through 14'-0"
- Short, Long, Flush, and Oak Summit Panels, which are alternate embossment patterns in the skin
- 4 short panel or 2 long panel windows may be installed in 1 section
(3/32" annealed glass - meets ASTM E1300-04)

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