

# STRUCTURAL SOLUTIONS, P.A. \*

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## GARAGE DOOR STATIC PRESSURE TEST REPORT

|                        |                                                                                             |                 |                                  |                 |                 |
|------------------------|---------------------------------------------------------------------------------------------|-----------------|----------------------------------|-----------------|-----------------|
| Garage Door No.:       | IBC-2456-110-15                                                                             | Test Date:      | 9/1/2010                         | Project No.:    | 10-076          |
| Design Pressures:      | +16.7 psf, -18.9 psf                                                                        | Report Date:    | 10/20/2020                       |                 |                 |
| Test Pressures:        | +25.05 psf, -28.35 psf                                                                      | Test Location:  | Amarr Garage Doors Test Facility |                 |                 |
| ASCE 7-16<br>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 |
|                        | 141 mph                                                                                     | 128 mph         | 122 mph                          | 117 mph         | 112 mph         |
| Witnessed By:          | Brandon Gentle - Amarr Garage Doors; Thomas L. Shelmerdine, PE - Structural Solutions, P.A. |                 |                                  |                 |                 |

### Description of Test Specimen:

A 16'-2" wide x 8'-0" high sectional garage door, one (1) section wide by four (4) sections high, each section being 2" inches thick by 24" high. The top & bottom sections were 24 gauge galvanized steel sheet, the intermediate sections were aluminum glazed with DSB annealed glass. The glazing is 1/8" annealed glass, which meets ASTM E1300-04. Each section was reinforced with two (2) 3" x 20 gauge galvanized steel struts. The door sections were connected together with one (1) 14 gauge galvanized steel end hinge at each end stile and one (1) 14 gauge galvanized steel center hinge at 3 interior stiles as shown on the drawing. Garage door Model No. 2400/3550 manufactured by Amarr Garage Doors was used in the test. The test unit is further described on drawing IBC-2456-110-15.

### Manner of Testing:

This test was conducted on the above date at the Amarr Garage Doors Test Facility. The specimen was tested for static pressure structural performance in substantial conformance with the procedures described in 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 4' deep, 9' high, and 20' long. The enclosure was framed with shop welded steel angles and covered with 3/4" thick plywood. The door was covered with plastic sheeting to prevent leakage of air pressure. At one end of the enclosure, a "Dwyer" Series 477 Digital manometer was attached to measure pressure inside the enclosure. Two duct fans were attached in series to the enclosure with flexible ducting to provide the positive and negative pressures. Amarr has been accredited by the American Association for Laboratory Accreditation, Certificate #2595.01, since May 8, 2007.

### 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:

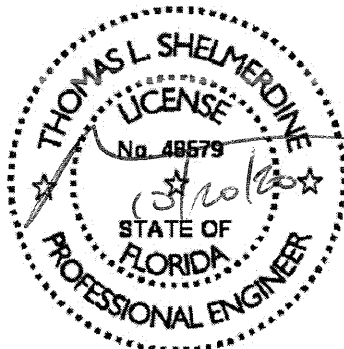
No failures occurred as a result of the noted loadings. The door remained operable after both positive and negative tests.

### Summary:

The 16'-2" x 8' Model 2400/3550 as described on Drawing IBC-2456-110-15 meets or exceeds the testing criteria as described above. By comparison to the construction of the 16'-2" x 8' Model 2400/3550, the following doors also meet or exceed the above testing criteria, when constructed in accordance with Drawing IBC-2456-110-15:

- Model 2000/3550 doors (which use thicker 20 gage steel sections)
- Model 2400/3550 and Model 2000/3550 doors with widths up to 16'-2" and heights up to 24'-0".

Submitted by:



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