

# STRUCTURAL SOLUTIONS, P.A.\*

Structural Engineering ■ Investigations ■ Consulting

## GARAGE DOOR STATIC PRESSURE TEST REPORT

|                        |                                                                                             |                 |                 |                               |                 |        |
|------------------------|---------------------------------------------------------------------------------------------|-----------------|-----------------|-------------------------------|-----------------|--------|
| Garage Door No.:       | IBC-2414-145-24                                                                             |                 | Test Date:      | 12/18/2014                    | Project No.:    | 14-154 |
| Design Pressures:      | +29.2 psf, -33.3 psf                                                                        |                 | Report Date:    | 10/30/2020                    | Model #         | 2400   |
| Test Pressures:        | +43.8 psf, -50 psf                                                                          |                 | Test Location:  | Entrematic, Winston-Salem, NC |                 |        |
| 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 |        |
|                        | 187 mph                                                                                     | 170 mph         | 161 mph         | 154 mph                       | 148 mph         |        |
| Witnessed By:          | Brandon Gentle - Entrematic / Amarr; Thomas L. Shelmerdine, PE - Structural Solutions, P.A. |                 |                 |                               |                 |        |

### Description of Test Specimen:

A 14'-2" wide x 8'-0" high 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 one 4-1/2" 20 gauge galvanized steel R-truss; the bottom section also had one 3" 20 gauge galvanized steel strut. The door sections were connected together with two 14 gauge galvanized steel end hinges at each end stile and one 14 gauge galvanized steel center hinge at 3 interior stiles as shown on the drawing. Amarr Model 2400 manufactured by Entrematic was used in the test. The test unit is further described on Drawing IBC-2414-145-24.

### 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 108-05 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:

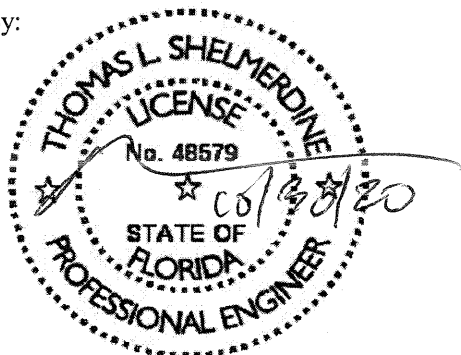
No failures occurred as a result of the noted loadings. The door remained operable after both positive and negative tests.

### Summary:

A 14'-2"x8'-0" Amarr Model 2400 as described on drawing IBC-2414-145-24 meets or exceeds the testing criteria as described above. By comparison to the construction of the 14'-2"x8'-0" Amarr Model 2400, the following doors also meet or exceed the above testing criteria, when constructed in accordance with drawing IBC-2414-145-24:

- 14'-2" x 8'-0" Amarr Model 2000 doors (which are constructed of thicker 20 gauge steel in lieu of 24 gauge steel)
- Amarr Model 2000 and 2400 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" plexiglass, 21 3/8" x 3 1/4" x 1/8" DSB, or 21 3/8" x 3 1/4" x 0.080" plexiglass)

Submitted By:



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