

## **Scott A. Brown, Professional Engineer**

Evaluation reports are the opinion of the evaluation entity, based on the findings, and in no way constitute or imply approval by a local building authority. I, Scott A. Brown P.E. have reviewed the data submitted by Raynor Garage Doors and in my opinion, the product, material, system, or method of construction specifically identified in this report conforms to the requirements of the 8<sup>th</sup> Edition (2023) of the Florida Building Code, subject to the limitations in this report.

**Report No.:** 37-C

**Submitted:** 10/04/17

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**Category:** Exterior Doors

### **Submitted By:**

Raynor Garage Doors  
1101 East River Road  
Dixon, IL 61021

### **Evaluation Entity:**

Scott A. Brown P.E.  
698 Timber Creek Road  
Dixon, IL 61021

### **Evaluation Test Standards:**

ANSI/DASMA 108-2017  
ANSI/DASMA 115-2017  
TAS 201-94  
TAS 202-94  
TAS 203-94

## **1. Product Trade Name**

### **1.1 Pan Doors**

- 1.1.1 SteelForm 26 ga
- 1.1.2 SteelForm 24 ga
- 1.1.3 SteelForm 20 ga
- 1.1.4 BuildMark
- 1.1.5 TradeMark

### **1.2 Sandwich Doors**

- 1.2.1 ShowCase
- 1.2.2 Masterpiece
- 1.2.3 TC200

### **1.3 Aluminum Rail and Stile Doors**

- 1.3.1 AlumaView (AV200)

## 2. Scope of Evaluation

2.1 **Structural:** Transverse wind loads.

## 3. Uses

3.1 Raynor garage doors are used as garage doors with specified allowable transverse wind pressures.

## 4. Models

4.1.1 **SteelForm 26 Ga. (S24C):** Sections shall be pan style 2" thick, roll formed from 26 ga. (.017 min.) commercial quality hot dip galvanized steel. Each door section has two deep ribs and four pencil grooves for additional strength and a tongue and groove section joint.

4.1.2 **SteelForm 24 Ga. (S24) also referred to as MB24:** Sections shall be pan style 2" thick, roll formed from 24 ga. (.023 min.) commercial quality hot dip galvanized steel. Each door section has two deep ribs and four pencil grooves for additional strength and a tongue and groove section joint.

4.1.3 **SteelForm 20 Ga. (S20):** Sections shall be pan style 2" thick, roll formed from 20 ga. (.035 min.) commercial quality hot dip galvanized steel. Each door section has two deep ribs and four pencil grooves for additional strength and a tongue and groove section joint.

4.1.4 **BuildMark also referred to as BuildMark S:** Sections shall be pan style 2" thick roll formed from 26ga. (.017 min) hot dipped galvanized steel. Each door section is wood grain textured with embossed panels and has tongue and-groove section joint.

4.1.5 **TradeMark:** Sections shall be pan style 2" thick roll formed from 24 ga. (.023 min) hot dipped galvanized steel. Each door section is wood grain textured with embossed panels and has tongue and-groove section joint.

4.1.6 **ShowCase:** Sections shall be sandwich-style, 2-inch-thick insulated door panels with tongue-and-groove section joint made from minimum 0.015-inch-thick galvanized steel roll-formed interior and exterior skins with embossed panels and wood grain texture. The doors are insulated with expanded polystyrene foam that is bonded to the interior and exterior steel skins.

4.1.7 **Masterpiece:** Same as ShowCase except for painted hardware.

4.1.8 **TC200:** Sections shall be sandwich-style, 2-inch-thick insulated door panels with tongue-and-groove section joint made from minimum 0.015-inch-thick galvanized steel roll-formed interior and exterior skins with flush panels and stucco texture. The doors are insulated with expanded polystyrene foam that is bonded to the interior and exterior steel skins.

**4.1.9 AlumaView (AV200):** Sections shall be 1-15/16" thick 6063T6 aluminum alloy frame with impact resistant panels or impact resistant glass. Stiles and rails to be joined together with 5/16" x 1" self-threading screws. Adhesive is used to attach the glazing channel to the panel and/or glass. An aluminum glazing retainer is screwed around the perimeter of the panel or glass securing it to the section. AlumaView (AV200) is a commercial type door.

**4.1.10 StyleView Wide Profile:** Same as AlumaView (AV200) except StyleView Wide Profile is a residential type door.

**4.1.11 StyleView Custom Profile:** Same as AlumaView Optima except StyleView Custom Profile is a residential type door with more panel options like; Custom Carriage House and Custom Mixed Panels.

## 5. Reinforcing

**5.1 General:** Raynor garage doors sections may be reinforced horizontally with roll-formed galvanized steel u-bars and/or box struts.

**5.1.1 U-bar:** Horizontal reinforcing U-shaped sections, 2-5/8" deep x 2" wide x 18 ga. (.049 inch minimum) galvanized steel, 80 KSI minimum tensile.

**5.1.2 Box Struts:** Horizontal reinforcing U-shaped sections, 4-1/2" deep x 5.04" wide x 20 ga. (0.035 inch minimum) galvanized steel, 80 KSI minimum tensile.

**5.1.3 Removable Post:** Square Galvanized Tube, 1 3/4" x 1 3/4" x 12 ga. (0.105 inch minimum). The posts are stored on a wall in the garage close to the garage door and attached to the door vertically when high winds warnings are issued. The posts are anchored to the floor with a 1/2" diameter x 3 1/2" long pin. The top of the posts has a 1/2" diameter x 8" long carriage bolt which engages a bracket that is attached to the header with (4) 5/16" x 1 3/4" long lag screws. The post is attached to the door with u-shaped straps which attach to a bracket on the door with a 5/16" x 2 1/2" clevis pin and hairpin cotter pin. A wind loaded door with a Removable post system also incorporates u-bar trussing.

## 6. Installation

**6.1 General:** Raynor garage doors are to be installed in accordance with the manufacturer's published installation instructions, engineering drawings and this report. The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation. The information within this report governs if there are any conflicts between the manufacturer's instructions and this report.

## 7. Allowable Wind Loads

The doors shown in Table 1 were tested to ANSI/DASMA 108 for static air pressure and doors shown in Table 2 were tested to ANSI/DASMA 108 for static air pressure and ANSI/DASMA 115 for impact and cyclic loading. Doors shown in Table 3 were tested to TAS 202 for Static Air Pressure and TAS 201 and TAS 203 for Impact and Cyclic loading.

**Table 1**

Door Model(s)	Maximum Door Width	Drawing Number	Design Loads		Large Missile Impact Resistant	Test Report Number	Test Date
SteelForm 26ga	9' - 2"	P-2405	+ 42.1	- 47.6	No	1521	2/23/2012
	16' - 2"		+ 22.0	- 24.7		1526	3/13/2012
	18' - 2"		+ 23.2	-30.7		1523	3/5/2012
	8' - 2"	P-2406	+ 22.6	- 27.0	No	1993	3/21/2021
	9' - 2"		+ 20.0	- 23.5		1522	2/28/2012
	16' - 2"		+ 10.6	- 12.0		1528	3/20/2012
	16' - 2"	P-2407	+ 43.3	- 53.3	No	1529	3/26/2012
	18' - 2"		+ 30.0	- 41.2		1525	3/8/2012
	9' - 2"	P-2408	+ 34.0	- 38.5	No	1520	2/23/2012
	16' - 2"		+ 16.3	- 18.3		1529	3/26/2012
	18' - 2"		+ 18.1	- 20.2		1524	3/5/2012
						1994	3/3/2021
	9' - 2"	P-2429	+ 16.1	- 18.2	No	1654	11/12/2014
10' - 2"	+ 18.5		- 20.9	1653		11/7/2014	
BuildMark TradeMark	9'-0"	P-2300	+18.5	-20.9	No	1519	2/21/2012
BuildMark TradeMark	16'-0"	P-2357	+16.0	-17.7	No	1540	5/1/2012
ShowCase Masterpiece	16'-0"	P-2365	+26.4	-29.4	No	1538	4/26/2012
ShowCase Masterpiece w/glass	16'-0"	P-2365	+18.0	-20.0	No	1536 1537	4/24/12 4/25/12
BuildMark TradeMark	16'-0"	P-2358	+18.0	-22.7	No	1541	5/2/2012
AlumaView (AV200) StyleView	14'-2"	P-2409	+43.0	-48.0	No	1546	6/6/2012
BuildMark TradeMark	9'-0"	P-2301 (1) Center Stile	+24.8	-28.0	No	1518	2/15/2012
		P-2301 (3) Center Stile	+31.0	-35.1	No	1597	4/1/2013

**Table 2**

Door Model(s)	Maximum Door Width	Drawing Number	Design Loads		Large Missile Impact Resistant	Test Report Number	Test Date
BuildMark	16'-0"	P-3318	+39.3	-43.8	Yes	1503	1/23/12
						1504	1/24/12
BuildMark TradeMark	16'-0"	P-3361	+47.3	-47.3	Yes	1508	1/27/12
						1509	1/27/12
BuildMark TradeMark	18'-0"	P-3317	+37.4	-41.7	Yes	1532	4/11/12
						1533	4/13/12
BuildMark TradeMark	9'-0"	P-3322	+41.6	-47.1	Yes	1514	02/07/12
						1515	02/08/12
						1638	11/22/13
						1639	11/22/13
AlumaView (AV200) StyleView	14'-2"	P-3327	+43.0	-48.0	Yes	1547	6/12/12
						1548	6/18/12

**Table 3**

Door Model(s)	Maximum Door Width	Drawing Number	Design Loads		Large Missile Impact Resistant	Test Report Number	Test Date			
TradeMark	9'-0"	P-3307	+65.0	-75.0	Yes	G493-1101-09	11/5/09			
	12'-0"		+56.4	-65.1				Yes	G493-1201-09	11/19/09
	16'-0"		-45.0	-52.0				Yes	G493-1101-09	11/6/09
SteelForm Standard 24 Ga & 20 Ga	12' - 2"	P-3310	+41.5	-47.0	Yes	G493-0305-08	3/10/08			
ShowCase Masterpiece TC200	9' - 0"	P-3312	+65.0	-75.0	Yes	G493-1201-09	12/9/09			
	12' - 0"		+56.4	-65.1				Yes	G493-1201-09	12/8/09
	16' - 0"		-45.0	-52.0				Yes	G493-1102-09	11/19/09
SteelForm Standard 24 Ga & 20 Ga	9' - 2"	P-3313	+80.0	-85.8	Yes	G493-0301.10	3/10/10			
	12' - 2"		+60.0	-74.5				Yes	G493-0301.10	3/9/10
	18' - 2"		+40.0	-52.0				Yes	G493-0301.10	3/12/10
TradeMark	18' - 2"	P-3308	+43.5	-50.0	Yes	G493-1102-09	12/10/09			
ShowCase Masterpiece TC200	18' - 2"	P-3314	+43.5	-50.0	Yes	G493-0403-10	4/21/10			

## 8. Substantiating Data

**8.1 Test Reports:** Testing for doors shown in Table 1 and Table 2 was done at Raynor Garage Doors test lab in Dixon Illinois which is accredited by ANSI National Accreditation Board (ANAB) at the time of testing, scope of accreditation can be found at <http://www.anab.org>. Testing was witnessed by an independent third party Florida Registered Professional Engineer, Scott A. Brown P.E. Test reports were prepared by Raynor Garage Doors and signed and sealed by Scott A. Brown P.E., see Table 1 and Table 2 for report numbers and test dates.

Testing for doors shown in Table 3 was done at Hurricane Test Lab (HTL) in Lithia Springs, Georgia which is a Miami-Dade County approved test lab as well as a Florida approved test lab. Test reports were prepared by HTL and signed and sealed by Vinu J. Abraham P.E., see Table 3 for report numbers.

**8.2 Engineering Drawings:** Drawings listed in Table 1 and Table 2 were prepared by Raynor Garage Doors under the direction of Scott A. Brown P.E. and then reviewed, signed, sealed and dated by Scott A. Brown P.E.. See Table 1 and Table 2 for drawing numbers.

Drawings listed in Table 3 were prepared by Raynor Garage Doors under the direction of Scott A. Brown P.E. and then reviewed, signed, sealed and dated by Scott A. Brown P.E.. See Table 3 for drawing numbers.

### 8.3 Calculations:

**8.3.1 Jamb Attachment:** Calculations on jamb attachment, the results are shown on drawings listed in this report.

**8.3.2 Rational Analysis:** Because all door sizes can't be tested, rational analysis was used to determine pressure ratings for those door sizes not tested. Two areas were checked in the analysis, bending moment of the section and the jamb loads on the edge hardware.

Basic Bending Moment Calculation:  $((w_1) (l_1)^2) / 8 = ((w_2) (l_2)^2) / 8$

Basic Jamb Load Calculation:  $((w_1) (l_1)) / 2 = ((w_2) (l_2)) / 2$

Where: w = pressure, l = door width

## 9. LIMITATIONS

**9.1** The doors shall be installed in accordance with the manufacturer's published installation instructions in this report and the manufacturer's published installation instructions, engineering drawings and this report.

**9.2** The structural elements supporting the door track brackets shall be designed by a registered professional engineer for the wind loads shown on the drawings listed in this evaluation.

**9.3** The doors shall not be installed in areas where the transverse wind loads exceed the allowable loads shown in Table 1.

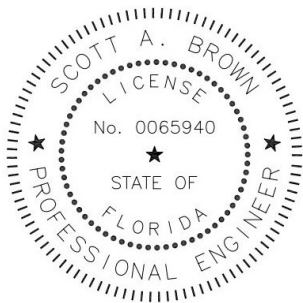
**9.4** Doors listed in this report do not address the requirements of the High Velocity Hurricane Zone (HVHZ).

## **10. IDENTIFICATION**

**10.1** Each Raynor Garage Door covered by this report shall be labeled with the manufacturer's name, drawing number, Florida approval number for field identification.

## **11. Further Information**

**11.1** Scott A. Brown F.P.E. #65940 does not have, nor intend to acquire a financial interest in Raynor Mfg. or any other company manufacturing or distributing products for which this report is being issued; Scott A. Brown F.P.E. #65940 is not controlled by Raynor Mfg. or any other company manufacturing or distributing any portion of the product being tested, evaluated or approved by this report.



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Structural Adequacy for Wind Load

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