



# Technical Evaluation Report

TO ASSIST WITH CODE COMPLIANCE

## Evaluation of Ceco Door Assemblies for Wind Pressure Resistance and Building Code Compliance

TER No. 1107-02

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### DIVISION: 08 00 00 – OPENINGS

Section: 08 01 00 – Operation and Maintenance of Openings

Section: 08 10 00 – Doors and Frames

Section: 08 30 00 – Specialty Doors and Frames

Section: 08 70 00 – Hardware

#### 1. Products Evaluated:

- 1.1. Ceco metal door assemblies consisting of single or double leafs
  - 1.1.1. Steel door leaf
    - 1.1.1.1. Series Legion – Polystyrene core
    - 1.1.1.2. Series Regent – Honeycomb core
    - 1.1.1.3. Series Medallion – Rib-stiffened door
  - 1.1.2. Door frame
    - 1.1.2.1. 16 ga. or 14 ga. steel, cold-rolled or galvanized
    - 1.1.2.2. Mechanically fastened or welded corners
  - 1.1.3. Hardware series
    - 1.1.3.1. Active leaf locksets
      - 1.1.3.1.1. ML2000 by Corbin-Russwin Mortise (lock with latch and deadbolt)
      - 1.1.3.1.2. 8200 by Sargent – Mortise (lock with latch and deadbolt)
      - 1.1.3.1.3. 8800 by Yale – Mortise (lock with latch and deadbolt)

**DrJ is a Professional Engineering Approved Source**

Applying for ISO/IEC 17065 Accreditation

The *IBC* defines:

- **APPROVED SOURCE** – “An independent person, firm or corporation, *approved* by the *building official*, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.”

DrJ's building construction professionals meet the competency requirements as defined in the *IBC* and can seal their work. DrJ is regularly engaged in conducting and providing engineering evaluations of single-element and full-scale building systems tests. This TER is developed from test reports complying with *IBC* Section 104.11.1 Research reports, which states, “Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved sources*.”

## Technical Evaluation Report (TER)

### 1.1.3.2. Inactive leaf surface bolts

1.1.3.2.1. 988CR – by Corbin-Russwin

1.1.3.2.2. 988Y – by Yale

1.1.3.2.3. 988 – by Sargent

### 1.1.3.3. Hinges

1.1.3.3.1. McKinney TA2714 (4.5" x 4.5")

1.1.3.3.1.1. Minimum thickness, 0.134"

1.1.3.3.1.2. 4 per leaf for doors greater than 7' 6" in height

1.1.3.3.1.3. 3 per leaf for doors 7' 6" or less in height

1.1.3.3.2. Continuous hinges

1.1.3.3.2.1. McKinney MCK-12-HD, MCK-14HD, MCK-25-HD, MCK HG 305, MCK-FM300, MCK-FM3500 and MCK-FM3700

1.1.3.3.2.2. MarKar FM100, FM200, FM300, FM3500, FM1111 and HG 300

1.1.3.3.2.3. Pemko SPBFM and SPBFMHD

### 1.1.3.4. Door frame anchors

1.1.3.4.1. Masonry T

1.1.3.4.2. Masonry wire

1.1.3.4.3. Pipe sleeve anchor

1.1.3.4.3.1.  $\frac{3}{8}$ " Powers Power-Bolt

1.1.3.4.3.2.  $\frac{3}{8}$ " Hilti Kwik-Bolt III

1.1.3.4.3.3.  $\frac{3}{8}$ " Lag screw into Southern Pine lumber

1.1.3.4.3.4.  $\frac{3}{8}$ " HILTI Drop-In

1.1.3.4.4. Steel channel anchor

1.1.3.4.4.1. #14 Grade 5 screws

1.1.3.4.5. Welded multi-purpose anchor

1.1.3.4.5.1. #8 Grade 5 screws

1.1.3.4.6. Welded wood stud anchor

1.1.3.4.6.1. #8 Grade 5 screws

### 1.1.3.5. Louvers

1.1.3.5.1. WLV60 by Markar

1.1.3.5.2. LV-WS by Pemko

### 1.1.3.6. Vision light kits as limited by [Section 5.2.1](#)

1.1.3.6.1. Ceco 4880 or 4881 – Glasslam glazing

1.1.3.6.1.1. Contains  $\frac{5}{8}$ " pocket depth

1.1.3.6.1.2. Requires surround channel with PET flap and DOW CORNING 995 silicone

1.2. For the most recent version of this report, visit [drjengineering.org](http://drjengineering.org).

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### 2. Applicable Codes:<sup>1</sup>

- 2.1. 2006, 2009 and 2012 *International Building Code (IBC)*
- 2.2. *Minimum Design Loads for Buildings and Other Structures (ASCE 7-05 and ASCE 7-10)*
- 2.3. *ASTM E1886, E330 and E1996*
- 2.4. *Florida, High Velocity Hurricane Zone (HVHZ) Test Protocols TAS 201, TAS 202 and TAS 203*
- 2.5. 2007 and 2010 *Florida Building Code (FBC)*

### 3. Performance Evaluation:

- 3.1. Ceco door assemblies were evaluated, using their tested allowable design values, as a means of resisting wind pressures as required by the *IBC* and *ASCE 7*.
  - 3.1.1. Tested assemblies used the hardware listed in [Section 1](#). Assemblies were evaluated to determine their ability to resist the wind pressures required by *IBC* Section 1609, Wind Loads, and Section 1715.5, Exterior Window and Door Assemblies; the *Florida Building Code* Section 1620, High-Velocity Hurricane Zones – Wind Loads, and Section 1625, High-Velocity Hurricane Zones – Load Tests; and *ASCE 7-05* Chapter 6.
  - 3.1.2. Load calculations for each of the assemblies' components were assessed and compared to the test data to determine the ability of each individual component to withstand the required wind pressure as defined by the *IBC* and *ASCE 7* for the application.
  - 3.1.3. Shear strength of each of the assemblies' connections was evaluated for their ability to withstand the required wind pressure as defined by the *IBC* and *ASCE 7* for the application.

### 4. Product Description and Materials:

- 4.1. The assemblies assessed herein are comprised of:
  - 4.1.1. Single or double steel leafs
  - 4.1.2. Minimum 16 ga. steel door frames
  - 4.1.3. One door threshold
  - 4.1.4. Connection hardware to secure the frames to the building
  - 4.1.5. Hardware for securing the door leafs in the closed position
  - 4.1.6. Weather stripping
  - 4.1.7. One Ceco (4880 or 4881) light kit (optional)
- 4.2. The assembly size evaluated is a standard 8080 pair of doors. Smaller doors using the same connection hardware are permitted. Single leafs shall be permitted, provided the same connection hardware is used and the single door leaf size does not exceed 47-<sup>3</sup>/<sub>4</sub>" x 97-<sup>1</sup>/<sub>2</sub>".
- 4.3. Actual frame size is 100" x 98" and 100" x 100" with 4" face head.
  - 4.3.1. Jamb depth: 5-<sup>3</sup>/<sub>4</sub>" minimum, 14" maximum
  - 4.3.2. Face dimensions: Jambs 2"; Head 2" minimum, 4" maximum
- 4.4. Actual door leaf size is 47-<sup>13</sup>/<sub>16</sub>" x 95-<sup>1</sup>/<sub>2</sub>" x 1-<sup>3</sup>/<sub>4</sub>".
- 4.5. Ceco steel door assemblies are comprised of various combinations of the following components.
  - 4.5.1. Series Regent and Legion door leafs are comprised of:
    - 4.5.1.1. 16 ga. steel skins bonded to the core with contact adhesive
    - 4.5.1.2. Door face sheets are held together with a tab and slot construction, and an epoxy adhesive is applied along the full height of the door construction.
    - 4.5.1.3. Top and bottom channels are 16 ga. inverted channels spot welded to the door skins 3" from each end and 3" o.c. A 14 ga. top cap is welded to the top channel at each end and 6" o.c.

<sup>1</sup> Unless otherwise noted, code references are from the 2012 versions of the codes. This product is also approved for use with the 2000 and 2003 versions of the *IBC* and *IRC* and the standards referenced therein.

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- 4.5.1.3.1.** Legion series contains expanded Polystyrene EPS core conforming to ASTM C578, Type I.
- 4.5.1.4.2** Regent series contains Kraft Honeycomb core with cells consisting of 31# paper.
- 4.5.1.4.3** The active leaf of a pair is reinforced with a continuous 12 ga. door edge stiffener, which is welded to the pull side face sheet 12" o.c. and tack welded to the top and bottom of the face sheet. The edge stiffener is laminated to the push side face sheet with a continuous bead of adhesive. A 48"-long, 12 ga. internal reinforcing channel, centered on the lock location, is welded to the door edge stiffener, 6" from each end and 12" o.c.
- 4.5.1.4.4** The inactive leaf of a pair is reinforced with a continuous 12 ga. door edge stiffener. The edge stiffener is welded to the pull side face sheet 12" o.c. and tack welded to the top and bottom of the face sheet. The edge stiffener is laminated to the push side sheet with a continuous bead of adhesive. Two 48"-long, 12 ga. internal reinforcing channels, each centered at strike location, are welded to the door edge stiffener, 6" from each end and 12" o.c. 10"-long, 12 ga. reinforcing plates are welded to the top and bottom of the 12 ga. door edge stiffener for mounting of surface bolts. The plates are welded to the door edge stiffener at each corner, 1" from the top and bottom of the plate.
- 4.5.2.** Series Medallion door leafs are comprised of:
  - 4.5.2.1.** 16 ga. steel face skins and 22 ga. hat-shaped stiffeners are placed vertically 6" o.c. across the door and spot welded to the face sheets every 6" o.c. 18 ga. full height angles are spot welded to one skin. Lock and hinge edge seams are continuously welded. 16 ga. end channels are spot welded to the face sheets 3" from the ends and 3" o.c. A 14 ga. steel top cap is welded to the top channel at each end and 6" o.c.
  - 4.5.2.2.** The active leaf of a pair is reinforced with a continuous 12 ga. door edge stiffener, which is welded to the pull side face sheet 12" o.c. and tack welded to the top and bottom of the face sheet. The edge stiffener is laminated to the push side face sheet with a continuous bead of adhesive. A 48"-long, 12 ga. internal reinforcing channel, centered on the lock location, and is welded to the door edge stiffener, 6" from each end and 12" o.c.
  - 4.5.2.3.** The inactive leaf of a pair is reinforced with a continuous 12 ga. door edge stiffener. The edge stiffener is welded to the pull side face sheet 12" o.c. and tack welded to the top and bottom of the face sheet. The edge stiffener is laminated to the push side sheet with a continuous bead of adhesive. Two (2) 48"-long, 12 ga. internal reinforcing channels, each centered at strike location, are welded to the door edge stiffener, 6" from each end and 12" o.c. 10"-long, 12 ga. reinforcing plates are welded to the top and bottom of the 12 ga. door edge stiffener for mounting of surface bolts. The plates are welded to the door edge stiffener at each corner, 1" from the top and bottom of the plate.
- 4.5.3.** Door frames are three sided, 16 ga. or 14 ga. cold-rolled steel (may be galvanized) with mitered corners at each corner or face welded.
  - 4.5.3.1.** Frames are reinforced at a double door head for the surface bolt with an 18"-long, 12 ga. full sleeve.
- 4.5.4.** Threshold is Pemko 2005, 181, or 177 fastened with # 10 x 1.5" screws (wood framing). Alternatively, Tapcon screws having at least an equivalent performance in shear may be used where fastening into concrete is required. Screws are 6" from the end of the threshold and 12" o.c. maximum.
- 4.5.5.** Door frame connections to the building
  - 4.5.5.1.** Wood stud framing – welded wood stud anchors located 12" from the bottom of the frame and 24" o.c. maximum. Fastened to the stud with four (4) #8 x 1" Grade 5 screws per anchor.
  - 4.5.5.2.** Wood stud framing – welded pipe spacer or welded existing wall anchors located 12" from the bottom of the frame and 24" o.c. maximum. Fastened to the wood stud with  $\frac{3}{8}$ " x 5" minimum lag bolts. Minimum embedment is 3", and 1.75" is the minimum edge distance.
  - 4.5.5.3.** Metal stud framing – welded multi-purpose anchors located 12" from the bottom of the frame and 24" o.c. maximum. Fastened to the 18 ga. minimum metal stud with four (4) # 8 x 1" Grade 5 screws per anchor.
  - 4.5.5.4.** Steel building structure – three (3) welds, one (1) each, at 6" from the top and bottom and one centered in the jambs.  $\frac{3}{16}$ " x 1" long minimum welds on each side of the frame.

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- 4.5.5.5.** Masonry buck – welded pipe spacer or welded existing wall anchors located 12" from the bottom of the frame and 24" o.c. maximum. Fastened to the buck with  $\frac{3}{8}$ " x 6" minimum flat head sleeve anchors. Minimum embedment is 2.5", and 4" is the minimum edge distance.
- 4.5.5.6.** Masonry buck – welded pipe spacer or welded existing wall anchors located 12" from the bottom of the frame and 24" o.c. maximum. Fastened to the buck with  $\frac{3}{8}$ " Hilti Drop-In anchors. 3" is the minimum edge distance.
- 4.5.5.7.** Grouted masonry – Masonry Wire or Masonry T anchors located 18" to 24" o.c. maximum in grouted joints. May not be more than 12" from the corner of the frame.
- 4.5.6.** Frame Installation
  - 4.5.6.1.** Frames installed per guidelines shown in SDI/ANSI A2501.11
- 4.5.7.** Connections of the door leaf to the door frames
  - 4.5.7.1.** Four (4) hinges (4.5" x 4.5") at each door leaf having a height greater than 7'6"
  - 4.5.7.2.** Three (3) hinges (4.5" x 4.5") at each door leaf having a height 7'6" or less
  - 4.5.7.3.** Pemko – SPBFM and SPBFMHD continuous hinge
  - 4.5.7.4.** McKinney – MCK-12-HD, MCK-14HD, MCK-25-HD, MCK HG 305, MCK-FM300, MCK-FM3500 and MCK-FM3700 continuous hinge
  - 4.5.7.5.** Markar – FM100, FM200, FM300, FM3500, FM1111 and HG 300 continuous hinge
- 4.5.8.** Hardware for securing the door leaves in the closed position
  - 4.5.8.1.** Active leaf – latch bolts and deadbolts
    - 4.5.8.1.1.** ML2000 by Corbin – Russwin Mortise (lock with latch bolt and deadbolt)
    - 4.5.8.1.2.** 8200 Series by Sargent – Mortise (lock with latch bolt and deadbolt)
    - 4.5.8.1.3.** 8800 Series by Yale – Mortise (lock with latch bolt and deadbolt)
  - 4.5.8.2.** Inactive leaf – surface bolts
    - 4.5.8.2.1.** 988CR – by Corbin-Russwin
    - 4.5.8.2.2.** 988Y – by Yale
    - 4.5.8.2.3.** 988 – by Sargent
- 4.5.9.** Weather stripping – Pemko S88 adhesive weather-strip at each frame member. Pemko 303AS is mechanically fastened to the meeting edge of each door for pairs of doors.
- 4.5.10.** Vision light kits (optional) – Ceco 4880 or 4881 Flush Kit, limited to 60 psf or less
  - 4.5.10.1** Frame – 16 ga. 2 pc welded together 3" maximum from each end and 12" maximum from each end. Frame welded to door skins at  $\frac{5}{8}$ " maximum from each end and 8" maximum from each end.
  - 4.5.10.2** Stop – 20 ga. removable stops using #8 x 1  $\frac{1}{4}$ " flat head sheet metal screws set 2- $\frac{3}{4}$ " from each end and 7- $\frac{3}{4}$ " max o.c.
  - 4.5.10.3** Size – 22" x 66", multiple lights allowed
    - 4.5.11.3.1.1** Minimum 6" stile and rail
  - 4.5.10.4** Glazing
    - 4.5.10.4.1** Nebula glass – Glasslam Safety Plus 2 (Dade County NOA #08-0709.04)
    - 4.5.10.4.2** All glazing requires 0.125" x 0.5" double faced, closed cell foam tape.
    - 4.5.10.4.3** Glazing bedding – Nebula glass Glasslam requires DOW CORNING 995 Silicone.
- 4.5.12** Louvers
  - 4.5.10.1** Surround channel 20 ga. (0.625" leg x 1.656" x 1.5" leg) connected with 8" o.c. spot welds.
  - 4.5.10.2** Frame – Two-piece, 18 ga. connected with #8 x 1- $\frac{1}{2}$ " machine screw into 1- $\frac{1}{2}$ " feral 2" from each end and 12" o.c. maximum.
  - 4.5.10.3** Grill – 12 ga.
  - 4.5.10.4** Size
    - 4.5.10.4.1** Maximum louver size 34" x 78", 2652 sq in. Multiple louvers allowed.
    - 4.5.10.4.2** Minimum 6" stile and rail

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### 5. Applications:

- 5.1** The Ceco door assemblies described in this Technical Evaluation Report (TER) are used in commercial applications falling under the *IBC* Section 1609, Wind Loads, and Section 1715.5, Exterior Window and Door Assemblies; and the *FBC* Section 1620, High-Velocity Hurricane Zones – Wind Loads, and Section 1625, High-Velocity Hurricane Zones – Load Tests.
- 5.2** The Ceco door assemblies evaluated are designed to withstand a minimum design positive and negative wind pressure of 70 psf (105 psf ultimate load). These loads are adequate to withstand a design wind speed exceeding 165 mph (3 second gust) as shown in *IBC* Table 1609.6.2(1)<sup>2</sup> ([Table 1](#)).
- 5.2.1** Exception: Ceco door assemblies with optional Ceco 4880 or 4881 light kit are limited to design wind pressures of 60 psf. These loads are adequate to withstand a design wind speed exceeding 150 mph.

TABLE 1609.6.2(1)  
WIND VELOCITY PRESSURE ( $q_s$ ) AT STANDARD HEIGHT OF 33 FEET<sup>a</sup>

BASIC WIND SPEED (mph)	85	90	100	105	110	120	125	130	140	150	160	170
PRESSURE, $q_s$ (psf)	18.5	20.7	25.6	28.2	31.0	36.9	40.0	43.3	50.2	57.6	65.5	74.0

For SI: 1 foot = 304.8 mm, 1 mph = 0.44 m/s, 1 psf = 47.88 Pa.

a. For basic wind speeds not shown, use  $q_s = 0.00256 V^2$ .

**Table 1:** *IBC* Table 1609.6.2(1), Wind Velocity Pressure at Standard Height of 33 Feet

- 5.3** The following Ceco door assemblies consisting of the component parts defined in [Section 4.5](#) have been designed to withstand a maximum design positive and negative wind pressure of 70 psf (105 psf ultimate load). If optional light kits are used, they are limited to maximum positive and negative design wind pressure of 60 psf (90 psf ultimate load).

<sup>2</sup> Based on 2009 *IBC* and *ASCE7-05*.

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Allowable Components for Use with Ceco Single or Double Door Assemblies Meeting a Design Wind Pressure of 70 psf			
Components	Regent	Legion	Medallion
Core Options	Honeycomb	Polystyrene	Rib stiffened w/fiberglass
Door Frame Options	Cold-formed steel (14 ga.)	Cold-formed steel (14 ga.)	Cold-formed steel (14 ga.)
	Cold-formed steel (16 ga.)	Cold-formed steel (16 ga.)	Cold-formed steel (16 ga.)
	Galvanized steel (14 ga.)	Galvanized steel (14 ga.)	Galvanized steel (14 ga.)
	Galvanized steel (16 ga.)	Galvanized steel (16 ga.)	Galvanized steel (16 ga.)
Door Frame Anchors	Masonry T	Masonry T	Masonry T
	Masonry wire	Masonry wire	Masonry wire
	Pipe sleeve w/ 3/8" Powers Power-bolt	Pipe sleeve w/ 3/8" Powers Power-bolt	Pipe sleeve w/ 3/8" Powers Power-bolt
	Pipe sleeve w/ 3/8" Hilti Kwik-Bolt III	Pipe sleeve w/ 3/8" Hilti Kwik-Bolt III	Pipe sleeve w/ 3/8" Hilti Kwik-Bolt III
	Pipe sleeve w/ 3/8" lag screw into Southern Pine framing	Pipe sleeve w/ 3/8" lag screw into Southern Pine framing	Pipe sleeve w/ 3/8" lag screw into Southern Pine framing
	#8 sheet metal screws into wood or steel studs HILTI Drop-In	#8 sheet metal screws into wood or steel studs HILTI Drop-In	#8 sheet metal screws into wood or steel studs HILTI Drop-In
	3/8" Expansion shell anchor	3/8" Expansion shell anchor	3/8" Expansion shell anchor
Hinges	McKinney TA2714	McKinney TA2714	McKinney TA2714
	McKinney MCK-12-HD, MCK-14HD, MCK-25-HD, MCK HG 305, MCK-FM300, MCK-FM3500 and MCK-FM3700	McKinney MCK-12-HD, MCK-14HD, MCK-25-HD, MCK HG 305, MCK-FM300, MCK-FM3500 and MCK-FM3700	McKinney MCK-12-HD, MCK-14HD, MCK-25-HD, MCK HG 305, MCK-FM300, MCK-FM3500 and MCK-FM3700
	MARKAR FM100, FM200, FM300, FM3500, FM1111 and HG 300	MARKAR FM100, FM200, FM300, FM3500, FM1111 and HG 300	MARKAR FM100, FM200, FM300, FM3500, FM1111 and HG 300
	Pemko SPBFM and SPBFMHD	Pemko SPBFM and SPBFMHD	Pemko SPBFM and SPBFMHD
Inactive Leaf Surface Bolts	Corbin Russwin – 988CR	Corbin Russwin – 988CR	Corbin Russwin – 988CR
	Sargent – 988	Sargent – 988	Sargent – 988
	Yale – 988Y	Yale – 988Y	Yale – 988Y
Active Leaf Locksets	Corbin Russwin – ML2000 series	Corbin Russwin – ML2000 series	Corbin Russwin – ML2000 series
	Sargent – 8200 series	Sargent – 8200 series	Sargent – 8200 series
	Yale – 8800 series	Yale – 8800 series	Yale – 8800 series
Threshold	Pemko 2005 with (8) #10 x 1.5" screws	Pemko 2005 with (8) #10 x 1.5" screws	Pemko 2005 with (8) #10 x 1.5" screws
Weather Stripping	Pemko 303AS	Pemko 303AS	Pemko 303AS
Light Kits (optional)	Ceco # 4881	Ceco # 4881	Ceco # 4880
Louvers (optional)	WLV60 by Markar	WLV60 by Markar	WLV60 by Markar
	LV-WS by Pemko	LV-WS by Pemko	LV-WS by Pemko

**Table 2:** Allowable Components for Use with Ceco Single or Double Door Assemblies Meeting a Design Wind Pressure of 70 psf



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### 6. Test and Engineering Substantiating Data:

- 6.2 *National Design Specification for Wood Construction* – 2005 Edition, American Forest & Paper Association (NDS).
- 6.3 *Design Loads for Buildings and Other Structures*, American Society of Civil Engineers, ASCE 7-05.
- 6.4 *Design Loads for Buildings and Other Structures*, American Society of Civil Engineers, ASCE 7-10.
- 6.5 Testing conducted for Ceco by Intertek, Report #3037990.
- 6.6 Testing conducted for Ceco by ATI, Report #676011.01-201-18.
- 6.7 Testing conducted for Ceco by ATI, Report #58626.01-201-18.
- 6.8 Testing conducted for Ceco by ATI, Report #51287.05-201-18.
- 6.9 Engineering calculations by Frank Bennardo, P.E., Project #07-CUI-0010.
- 6.10 Engineering calculations by Frank Bennardo, P.E., Project #07-CUI-0009.
- 6.11 Some information contained herein is the result of testing and/or data analysis by other sources, which DrJ relies on to be accurate as it undertakes its engineering analysis.
  - 6.11.1 DrJ does not assume responsibility for the accuracy of data provided by testing facilities, but relies on each testing agency's accuracy and accepted engineering procedures, experience, and good technical judgment.
- 6.12 Where appropriate, DrJ relies on the derivation of design values, which have been codified into law through the codes and standards (e.g., *IRC*, *WFCM*, *IBC*, *SDPWS*, etc.), to undertake the review of test data that is comparative or shows equivalency to an intended end-use application.
  - 6.12.1 DrJ does not assume responsibility for the accuracy of any code-adopted design values but relies upon their accuracy for engineering evaluation.
  - 6.12.2 DrJ also relies on the fact that manufacturers of code-adopted products stand behind the legally established design values that have been created by the associations that publish code-defined design values for a given commodity product.
  - 6.12.3 DrJ evaluates all equivalency testing and related analysis using this code-defined engineering foundation.

### 7. Findings:

- 7.2 When used in accordance with this TER and the manufacturer's installation instructions, the Ceco door assemblies listed herein meet the wind pressure requirements of the 2003, 2006, 2009 and 2012 editions of the *IBC* for both positive and negative design wind pressures up to and including 70 psf.
- 7.3 Exception: The Ceco door assemblies listed herein with the optional Ceco 4880 or 4881 light kit meet the wind pressure requirements of the 2003, 2006, 2009 and 2012 editions of the *IBC* for both positive and negative design wind pressures up to and including 60 psf.

### 8. Conditions of Use:

- 8.2 Ceco door assemblies covered by this report shall be installed in accordance with the manufacturer's installation instructions.
- 8.3 Manufacturer's installation instructions shall be followed as provided at [www.cecodoor.com](http://www.cecodoor.com).
- 8.4 Ceco door assemblies falling under this TER shall not exceed the standard size 8080 nominal dimensions.
- 8.5 Ceco door assemblies may be comprised of any of the combinations of components listed in [Table 2](#) to achieve to a code compliant 70 psf design wind pressure, except as noted in [Section 5.2.1](#).
- 8.6 For conditions not covered in this TER, connections shall be designed in accordance with generally accepted engineering practice.
- 8.7 Ceco doors are produced by Ceco Door of AADG, Inc.
- 8.8 Ceco doors are produced under a quality control program subject to periodic inspections in accordance with *IBC* Section 1703.5.2.



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### 9. Identification:

- 9.1. The Ceco doors described in this TER are identified by the designation “Ceco Door” on the packaging. The manufacture’s name, city and state will be on the packaging. The door model and sizes will be on a label on the door packaging and/or the door. A label with the mark of the third party inspection agency will be on the door and frame.
- 9.2. Additional technical information can be found at [cecodoor.com](http://cecodoor.com).

### 10. Review Schedule:

- 10.1. This TER is subject to periodic review and revision. For the most recent version of this report, visit [drjengineering.org](http://drjengineering.org).
- 10.2. For information on the current status of this report, contact [DrJ](#).



#### Responsibility Statement

The information contained herein is a product, engineering or building code compliance research report performed in accordance with the referenced building codes, testing and/or analysis through the use of accepted engineering procedures, experience and good technical judgment. Product, design and code compliance quality control is the responsibility of the referenced company. Consult the referenced company for the proper detailing and application for the intended purpose. Consult your local jurisdiction or design professional to assure compliance with the local building code. DrJ ([drjengineering.org](http://drjengineering.org)) research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by DrJ, express or implied, as to any finding or other matter in this report or as to any product covered by this report.

**Appendix A:**

**TERs Are Comparable to, Compatible with, and Equivalent to the Purpose of an ICC-ES ESR**

1. Technical Evaluation Reports (TERs), drafted and maintained by DrJ (professional engineering firm and ISO/IEC 17065 applicant through ANSI/ACCLASS), assess how specific products comply with the provisions of the building code. DrJ is a code-defined “approved source,” and DrJ employs professional engineers and follows state professional engineering rules and regulations.
2. TERs are comparable to, compatible with, and equivalent to the purpose of an ICC Evaluation Service (ICC-ES) Evaluation Service Reports (ESRs).<sup>3</sup>
  - 2.1. ICC Evaluation Service does not provide an engineer’s seal on any of its ESRs.
  - 2.2. Furthermore, the ICC-ES Evaluation Report Purpose is defined as follows<sup>4</sup>:



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**ICC EVALUATION SERVICE, LLC,  
RULES OF PROCEDURE FOR EVALUATION REPORTS**

**1.0 PURPOSE**

These rules set forth procedures governing ICC Evaluation Service, LLC (ICC-ES), issuance and maintenance of evaluation reports on building materials and products, methods of construction, prefabricated building components, and prefabricated buildings.

ICC-ES evaluation reports assist those enforcing model codes in determining whether a given subject complies with those codes. An evaluation report is not to be construed as representing a judgment about aesthetics or any other attributes not specifically addressed in the report, nor as an endorsement or recommendation for use of the subject of the report. Approval for use is the prerogative and responsibility of the Code Official; ICC-ES does not intend to assume, nor can ICC-ES assume, that prerogative and responsibility.

**2.3. ICC ESR Disclaimer<sup>5</sup>:**

*ICC-ES Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.*



<sup>3</sup> ICC Evaluation Service, LLC and the ICC-ES Evaluation Reports logo are registered trademarks of ICC-ES.

<sup>4</sup> See the “ICC-ES Rules of Procedure” at [www.icc-es.org/pdf/rules\\_evalrpts.pdf](http://www.icc-es.org/pdf/rules_evalrpts.pdf).

<sup>5</sup> Page 1 footer of each ICC-ES report that can be found at [www.icc-es.org/reports/index.cfm](http://www.icc-es.org/reports/index.cfm).

## Technical Evaluation Report (TER)

### 3. DrJ Sealed Engineering

- 3.1. DrJ engineers have undertaken the rigorous engineering and analysis work to determine the subject of this report's compliance with the codes and standards referenced in [Section 2](#).
- 3.2. DrJ work:
  - 3.2.1. Complies with accepted engineering procedures, experience and good technical judgment.
  - 3.2.2. Is the work of an independent person, firm or corporation who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.
- 3.3. A Technical Evaluation Report generated by DrJ is in all "code-compliance-evaluation-processing" respects equivalent to an ICC-ES ESR, as ICC-ES defines its approach, with one material difference.
  - 3.3.1. DrJ will seal all TERs, as needed, so that responsibility for the work is well-defined.
  - 3.3.2. The DrJ responsibility statement is identical to that provided in ICC-ES ESRs.

DrJ (drjengineering.org) research reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by DrJ express or implied as to any finding or other matter in this report or as to any product covered by this report.

**Appendix B:**  
**Legal Aspects of Product Approval**

**1. Product Approval**

- 1.1.** In general, the model and local codes provide for the use of alternative materials, designs and methods of construction by having a legal provision that states something similar to:

The provisions of this code/law are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code/law, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the compliance official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code/law, and that the material, design, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code/law.

- 1.2.** In concert with preserving “free and unfettered competition as the rule of trade”, should this alternative material, design or method of construction not be approved, the building official shall respond in writing, stating the specific reasons for non-code-compliance and/or for non-professional engineering regulation compliance.

Congress passed the first antitrust law, the Sherman Act, in 1890 as a “comprehensive charter of economic liberty aimed at preserving free and unfettered competition as the rule of trade.” In 1914, Congress passed two additional antitrust laws: the Federal Trade Commission Act, which created the FTC, and the Clayton Act. With some revisions, these are the three core federal antitrust laws still in effect today.

...Yet for over 100 years, the antitrust laws have had the same basic objective: to protect the process of competition for the benefit of consumers, making sure there are strong incentives for businesses to operate efficiently, keep prices down, and keep quality up....

The Sherman Act outlaws “every contract, combination, or conspiracy in restraint of trade,” and any “monopolization, attempted monopolization, or conspiracy or combination to monopolize.” For instance, in some sense, an agreement between two individuals to form a partnership restrains trade, but may not do so unreasonably, and thus may be lawful under the antitrust laws. On the other hand, certain acts are considered so harmful to competition that they are almost always illegal.

The penalties for violating the Sherman Act can be severe. Although most enforcement actions are civil, the Sherman Act is also a criminal law, and individuals and businesses that violate it may be prosecuted by the Department of Justice.<sup>6</sup>

**2. Legal Validity of this TER**

- 2.1.** This TER is a code-defined (e.g., 2009 IBC and [IRC Section 104.11.1](#) and 2009 [IBC Section 1703.4.2](#)) “research report” that provides supporting data to assist in the approval of materials, designs or assemblies not specifically provided for in this code.
- 2.2.** Therefore, this TER is a valid research report from a professional engineering company that complies with the code definition of “approved source.” If required by the authority having jurisdiction, this TER can also be sealed to comply with professional engineering laws and regulations.

<sup>6</sup> [http://www.ftc.gov/bc/antitrust/antitrust\\_laws.shtml](http://www.ftc.gov/bc/antitrust/antitrust_laws.shtml)