

December 16, 2014

Cornell Iron Works  
24 Elmwood Ave  
Mountaintop, PA 18707  
Attn: Trevor Errington



**RE: *Review, Evaluation, and Certification of Code Compliance***  
***Project #CIW011514-16 FL: Exterior Rolling Overhead Doors***  
***(CP0020, CP0001, and CP0651 Slats)***

*Includes insulated and non-insulated doors rated for "Non-Impact", 50 FPS, and 80 FPS impact velocity conditions.*

To whom it may concern:

Moment Engineering + Design has performed a comprehensive structural review of the Cornell Iron Works Rolling Overhead Door product lines described above, for typical installations in the State of Florida.

**Statement of Compliance:**

When constructed and installed per the conditions and design criteria described herein, the Rolling Overhead Door product lines described above are compliant with applicable sections of the design reference documents noted below.

**Design Reference Documents:**

- 2010 Florida Building Code
- FBC Test Protocols TAS 201, 202, and 203
- 2009 International Building Code
- ASCE/SEI 7-10 – Minimum Design Loads for Buildings & Other Structures
- Proprietary load test data and evaluation (see technical documentation below)
- Proprietary sections and materials properties as noted

**Overview:**

The doors described in this report consist of a continuous door panel made of interlocking cold-formed steel slats suspended from an overhead drum roller. The drum roller serves to store the curtain in a coiled configuration when the door is opened. Note that evaluation of the drum roller assembly is not included in this report.

The sides of the curtain are constrained from lateral movement along their vertical edges by steel guides attached to the door jambs. This constraint provides resistance to lateral wind forces. Various guide configurations are used for the different door styles included in this report. The lateral wind forces are transferred from the curtain to the guides and then through the attachment elements to the door jamb. The door jambs are part of the main wind force resisting system of the existing structure and are usually constructed of steel, concrete, or concrete masonry units. Resistance of existing structures to design loads from proposed overhead rolling doors is not included in the scope of this analysis and should be evaluated by a registered design professional where required by the authority having jurisdiction.

Details of door assembly and associated components appear in the following documents:

**Table 1.** Rolling door systems evaluated, with applicable drawings by Cornell Iron Works

Configuration	Impact Rating	Drawing No.	Revision Date	Detail Sheets	Configuration Table Sheets
Non-Insulated	Non-impact	ES-16-62-CIW	9/30/2014	1-9	10-21
Non-Insulated	50 FPS	ES-16-60-CIW	11/20/2014	1-9	10-19
Non-Insulated	80 FPS	ES-16-61-CIW	10/2/2014	1-9	10-15
Insulated	Non-impact	ES-16-65-CIW	11/18/2014	1-9	10-21
Insulated	50 FPS	ES-16-63-CIW	11/18/2014	1-9	10-16
Insulated	80 FPS	ES-16-64-CIW	11/18/2014	1-9	10-13

Allowable configurations of this door assembly under applicable wind loads are tabulated in the configuration tables sheets noted above.

### Door Slats:

#### CP0020 Slats:

All non-insulated doors covered by this report use a CP0020 slat with a minimum thickness of 0.0220" (0.0405" thickness for perforated slats). The nominal dimensions of the formed slat are approximately 2-5/8" height by 3/4" depth for all CP0020 slats.

#### CP0001/CP0651 Slats:

All insulated doors covered by this report use a CP0001 or CP0651 slat. The minimum thickness of the front portion of these slats is 0.0220". The minimum thickness of the back portion of these slats is 0.0220". The dimensions of the formed slats are approximately 3" height by 1" depth for all CP0001 and CP0651 slats. The CP0001 is injected with a polyurethane foam insulation. The CP0651 is filled with mineral wool insulation.

Slats may be manufactured using galvanized steel sheet, ASTM A653 HSLAS, grade 40; ASTM A653 HSLAS-F, grade 40; or ASTM A653 structural steel, grade 40. Stainless steel slats may use Type 201, 304, 316, or 430 alloys with minimum specified yield strength of 40 ksi.

A rational analysis was made on each tabulated door to determine the structural requirements of the curtain, guides, windlock attachments, and guide attachments for each of the indicated design wind pressures. A comparison with test results was made to substantiate analysis results.

### Technical Documentation:

Test results were used to substantiate the analysis procedure. The following information was considered in a comparative analysis of the design:

#### I. Door Tests with Non-Insulated Slats

1. TAS 201-94, 202-94, 203-94 -- Testing of roll-up door assembly with 0.0236" and 0.0296" CP0020 slat profiles per FBC HVHZ and Miami-Dade County requirements. Parameters: 14'-5" width, 10' height, design wind pressures  $\pm 65.15$  psf and large

- missile impact testing. Conducted by Architectural Testing, Inc. Report No: D1278.01-109-18, dated 01/29/2014. Miami-Dade County Notification No.: ATI 13008.
2. TAS 201-94, 202-94, 203-94 – Testing of roll-up door assembly with perforated CP0020 slat profiles per FBC HVHZ and Miami-Dade County requirements. Parameters: 27'-5" width, 10' height, design wind pressures  $\pm 60.0$  psf and large missile impact testing. Conducted by Architectural Testing, Inc. Report No: D5148.01-109-18, dated 06/20/2014. Miami-Dade County Notification No.: ATI 14005.
  3. TAS 201-94, 202-94, 203-94 – Testing of roll-up door assembly with perforated CP0020 slat profiles per FBC HVHZ and Miami-Dade County requirements. Parameters: 25'-5" width, 10' height, design wind pressures  $\pm 65.0$  psf and large missile impact testing. Report No: C6863.01-109-18-R0, dated 01/28/2014. Miami-Dade County Notification No.: ATI 13008.

## II. Door Tests with Insulated Slats

1. TAS 201-94, 202-94, 203-94 – Testing of “Thermiser” foam-insulated roll-up door assembly with CP0001 slat profiles (0.0405" front / 0.0220" back) per FBC HVHZ and Miami-Dade County requirements. Parameters: 14'-5" width, 10' height, design wind pressures  $\pm 120.0$  psf and large missile impact testing. Conducted by Architectural Testing, Inc. Report No: D1278.02-109-18, dated 01/29/2014. Miami-Dade County Notification No.: ATI 13008.
2. TAS 201-94, 202-94, 203-94 – Testing of “Thermiser” foam-insulated roll-up door assembly with CP0001 slat profiles (0.0296" front / 0.0220" back) per FBC HVHZ and Miami-Dade County requirements. Parameters: 12'-5" width, 10' height, design wind pressures  $\pm 65.0$  psf and large missile impact testing. Conducted by Architectural Testing, Inc. Report No: D2662.01-109-18, dated 02/07/2014. Miami-Dade County Notification No.: ATI 13008.
3. TAS 201-94, 202-94, 203-94 – Testing of “Thermiser” foam-insulated roll-up door assembly with CP0001 slat profiles (thickness varies per test) per FBC HVHZ and Miami-Dade County requirements. Parameters: 25'-5" width, 10' height, design wind pressures  $\pm 65.0$  psf and large missile impact testing. Report No: C6863.02-109-18-R0, dated 01/29/2014. Miami-Dade County Notification No.: ATI 13008.

## III. Research Slat Tests:

1. ASTM E330-02 test, 7'-0" clear span (CP0020 and CP0001 slats). Conducted by Architectural Testing, Inc. Report No. C4840.01-109-44-R1, dated 04/10/2013.

## Installation Requirements:

Installation requirements are described in the document “Cornell Iron Works: Service Door (Insulated and Non-Insulated) Installation Instructions, ES 10-341, Rev. 2, dated 2013-04-18”.

Drawings referenced above include design tables specifying allowable installation geometry for door panels under applicable design wind loads of 20, 30, 40, 50, 60, 65, 70, 80, 90, 100 psf (and 120 psf for insulated doors). Specific requirements are shown for selected door widths. All data tables shown in drawings ES-16-60-CIW, and ES-16-63-CIW are applicable for a large missile impact (as defined in applicable design reference documents noted previously) with design velocity of 50 fps. All data tables shown in drawings ES-16-61-CIW, and ES-16-64-CIW are applicable for a large missile impact (as defined in applicable design reference documents noted previously) with design velocity of 80 fps. Linear interpolation between data points shown in tables is permissible.

**Impact Resistance:**

Doors with CP0020 slats (0.00236”) and doors with CP0001 slats (0.0296” front / 0.0220” back) have passed the FBC Protocols TAS 201 and TAS 203 for impact on both sides of the door, permitting installation on either the inside or the outside of the wall. These tests were conducted on the lightest gage curtains doors shown in the detail drawings designed for impact resistance. All doors shown in drawings ES-16-60-CIW, ES-16-61-CIW, ES-16-63-CIW, and ES-16-64-CIW may be considered to be impact resistant.

**Limitations and Conditions of use:**

The use of the door is limited to buildings for which the design wind loads for wall components and cladding – determined in accordance with Section 1609 of the 2010 Florida Building Code – do not exceed the rated design wind loads of the door as shown on the Cornell drawings listed in Table 1.

The maximum width limitations for each style are shown in the attached tables. The maximum height for all doors is limited to 30 ft. The doors covered by this report are not designated for use in the High Velocity Hurricane Zone (HVHZ). Manufacturing of doors described in this report is limited to those plants that have met the Product Approval quality assurance requirements.

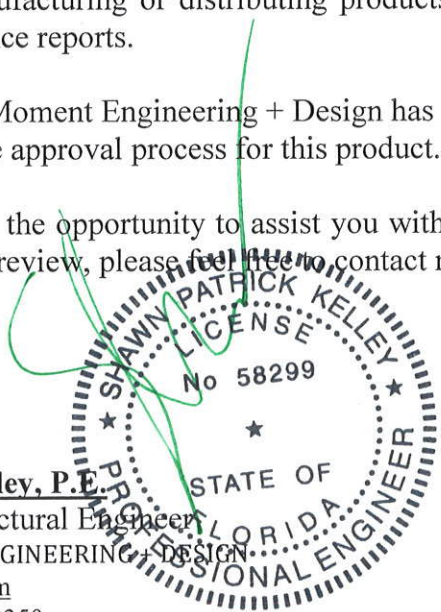
**Certification of Independence:**

I, Shawn P. Kelley, President, certify that Moment Engineering + Design, operates as an independent limited liability company providing professional engineering services. Neither I nor Moment Engineering + Design has a financial interest in – nor intent to obtain financial interest in – any company manufacturing or distributing products for which it has issued or will issue evaluation or code-compliance reports.

Neither I nor Moment Engineering + Design has nor will acquire a financial interest in any other entity involved in the approval process for this product.

We appreciate the opportunity to assist you with this project. Should you have any further questions regarding this review, please feel free to contact me directly at 703-988-2350.

Best Regards,



**Shawn P. Kelley, P.E.**

Principal, Structural Engineer

**moment** ENGINEERING + DESIGN

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- Attachments: Signed and sealed copy of Cornell Drawing No. ES-16-60-CIW, dated 12/10/2014.
- Signed and sealed copy of Cornell Drawing No. ES-16-61-CIW, dated 12/10/2014.
- Signed and sealed copy of Cornell Drawing No. ES-16-62-CIW, dated 12/10/2014.
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