



## TEST REPORT

**Report No.:** E1588.01-301-47

**Rendered to:**

CR LAURENCE CO., INC.  
Vernon, California

**PRODUCT TYPE:** Out-Swing Aluminum Bi-Fold Door  
**SERIES/MODEL:** Monterey S55

**SPECIFICATION(S):** AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights.*

Title	Summary of Results
AAMA/WDMA/CSA 101/I.S.2/A440-08	SP – PG20 : 2926 x 2570 mm
Design Pressure	±960 Pa (±20.05 psf)
Air Infiltration	0.1 L/s/m <sup>2</sup> (0.01 cfm/ft <sup>2</sup> )
Water Penetration Resistance Test Pressure	150 Pa (3.13 psf)

**Test Completion Date:** 01/21/15

Reference must be made to Report No. E1588.01-301-47, dated 02/18/15 for complete test specimen description and detailed test results.

**1.0 Report Issued To:** CR Laurence Co., Inc.  
2100 East 38th Street  
Vernon, California 90058

**2.0 Test Laboratory:** Architectural Testing, Inc.  
a subsidiary of Intertek (Intertek-ATI)  
4 Rancho Circle  
Lake Forest, California 92630  
949-460-9600

**3.0 Project Summary:**

**3.1 Product Type:** Out-Swing Aluminum Bi-Fold Door

**3.2 Series/Model:** Monterey S55

**3.3 Compliance Statement:** Results obtained are tested values and were secured by using the designated test method. The specimen tested successfully met the performance requirements for a **SP – PG20: 2926 x 2570 mm** rating.

**3.4 Test Dates:** 09/29/14 - 01/21/15

**3.5 Test Record Retention End Date:** All test records for this report will be retained until January 21, 2019.

**3.6 Test Location:** CR Laurence Co., Inc. test facility in Vernon, California. Calibration of test equipment was performed by Intertek-ATI in accordance with AAMA 205-01 "In-Plant Testing Guidelines for Manufacturers and Independent Laboratories".

**3.7 Test Specimen Source:** The test specimen was provided by the client. Representative samples of the test specimen will be retained by Intertek-ATI for a minimum of four years from the test completion date.

**3.8 Drawing Reference:** The test specimen drawings have been reviewed by Intertek-ATI and are representative of the test specimen reported herein. Test specimen construction was verified by Intertek-ATI per the drawings located in Appendix C. Any deviations are documented herein or on the drawings.

**3.9 List of Official Observers:**

<u>Name</u>	<u>Company</u>
Garrett Osterode	CR Laurence Co., Inc.
Marco Ramirez	CR Laurence Co., Inc.
Ron Wooten	CR Laurence Co., Inc.
Jarod S. Hardman	Intertek-ATI

#### 4.0 Test Specification:

AAMA/WDMA/CSA 101/1.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*.

#### 5.0 Test Specimen Description:

##### 5.1 Product Sizes:

Overall Area: 7.52 m <sup>2</sup> (80.94 ft <sup>2</sup> )	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	2926	115-3/16	2570	101-13/64
Primary panel	940	37	2438	96
Secondary panel (x2)	914	36	2438	96

##### 5.2 Frame Construction:

Frame Member	Material	Description
Head, sill, and jambs	Aluminum	Compensation channel, see attached drawing Die No. 12177, secured to opening at head and jambs with #10 x 1-1/2" Phillips pan head screw, 2" from each corner and 12" on center spacing.
Sill	Plastic	Glazing support shim, inserted into compensation channel prior to raised bottom track being inserted.
Sill	Aluminum	Raised bottom track, see attached drawing Die No. 12180, secured through glazing support shim and compensation channel with one #10 x 1-1/2" Phillips pan head screw, 2" from each end and 12" on center spacing.
Head	Aluminum	Top track, see attached drawing Die No. 12178.
Jambs	Aluminum	Lateral frame, see attached drawing Die No. 12184, secured to compensation channel with adjustable leveler Part #AC/35.01.129.

## 5.0 Test Specimen Description: (Continued)

### 5.2 Frame Construction: (Continued)

	Joinery Type	Detail
All corners	Flush	End dam (see attached Drawing No. MD55-001) sealed at corners with structural silicone sealant and cap bead applied to compensation channel to frame joint and compensation full perimeter at the interior and exterior.

### 5.3 Panel Construction:

Panel Member	Material	Description
Top rail, bottom rail, and stiles	Aluminum	Panel frame, see attached drawing Die No. 12181.
Lock stile	Aluminum	Jamb extender, see attached drawing Die No. 12183, snap fit to lock stile of primary panel and secured with #8 x 1-1/2" Phillips pan head screws 4" from each end and approximately 18" on center spacing.

	Joinery Type	Detail
All corners	Mitered	Secured at corners with corner block (see attached drawing Part No. MDCORNERW and MDCORNERWBH), each corner block inserted into adjoining member and retained by three dimples in metal. Corner block with hole utilized at lock stiles, all other corners were corner block without hole.

### 5.4 Weatherstripping:

Description	Quantity	Location
Bulb gasket (see attached Drawing No. WH343)	2 rows	Inserted into channels of compensation channel full perimeter of frame.
Foam filled 1/4" bulb gasket	1 row	Inserted into channel of exterior leg of raised top track and bottom track.
Foam filled 1/4" bulb gasket	1 row	Inserted into channel of interior leg of lateral frame.
Foam filled 1/4" bulb gasket	2 rows	Inserted into channels of lateral frame at jams.

## 5.0 Test Specimen Description: (Continued)

### 5.4 Weatherstripping: (Continued)

Description	Quantity	Location
Foam filled 1/4" bulb gasket	1 row	Inserted into channel of glazing beads.
Rigid EPDM gasket (see attached drawing Part No. AC/35.02.09)	1 row	Inserted into innermost channel of top rail of each panel.
Rigid EPDM gasket (see attached drawing Part No. AC/35.02.09)	2 rows	Inserted into innermost and outermost channel of bottom rail of each panel.
Rigid EPDM gasket (see attached drawing Part No. AC/35.02.09)	1 row	Inserted into channel of top track.
EPDM Gasket (see attached drawing Part No. AC/35.02.03)	3 rows	Inserted into channels of hinge stiles of each panel.

**5.5 Glazing:** *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen(s) can be made.*

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
1" IG	Aluminum spacer – Dual seal (A1-D)	5/32" tempered	5/32" tempered	Interior glazed with snap in glazing stop with glazing gasket, see attached drawings Die No. 12185 and Part #AC/35.02.17.

Location	Quantity	Daylight Opening		Glass Bite
		millimeters	inches	
Panel	3	792 x 2316	31-3/16 x 91-3/16	1/2"

## 5.0 Test Specimen Description: (Continued)

### 5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weep hole	3/4" x 3/16"	7	Through bottom of exterior leg of compensation channel and fitted with weep hole cover (see attached drawing Part #MDWHC), 8" from each end and 16" on center spacing.
Weep hole	2" x 3/8"	8	Through bottom horizontal member of raised bottom track to allow drainage into compensation channel, 5" from each end and 15" on center spacing.
Weep hole	2" x 1/4"	6	Through top horizontal member of the bottom rail of each panel between inner and center leg of extrusion to allow glazing pocket to drain, located at each end of the glazing pocket.
Weep hole	2" x 1/4"	6	Through top horizontal member of the bottom rail of each panel between center and outer leg of extrusion to allow glazing pocket to drain, located at each end of the glazing pocket.
Weep hole	2" x 1/4"	6	Through lower horizontal member of the bottom rail of each panel between inner and center leg of extrusion to allow the glazing pocket to drain, located at each end of the glazing pocket.
Weep hole	2" x 1/4"	6	Through lower horizontal member of the bottom rail of each panel between center and outer leg of extrusion to allow the glazing pocket to drain, located at each end of the glazing pocket.

## 5.0 Test Specimen Description: (Continued)

### 5.7 Hardware:

Description	Quantity	Location
Large-Handle Catch Assembly (see attached drawing Part No. MDAC350170EXT)	2	Located 40" from sill on each lock stile and secured to stile with two #10 x 1-1/2" Phillips oval head SMS through predrilled holes.
1/4"-20 threaded rod	4	Attached to the top and bottom of the Large-Handle Catch Assembly, inserted into the lock stile of panels with handle hardware, cut to length for the attachment of catch bolt.
Catch bolt (see attached drawing Part No. MDBOLT)	4	Threaded onto the threaded rod at the top and bottom of each lock stile.
Rod spacer (see attached drawing Part No. AC/35.01.55)	4	Inserted into the top and bottom rail at lock stile to guide the catch bolt.
Bottom hinge assembly (see attached drawing Part No. MDAC350153B)	1	Located 1-1/8" from bottom rail of stile opposite lock jamb stile and secured to each stile with two #8 x 1/2" Phillips pan head Tek screws.
Top hinge assembly (see attached drawing Part No. MDAC350153T)	1	Located 1-1/8" from top rail of stile opposite lock jamb stile and secured to each stile with two #8 x 1/2" Phillips pan head Tek screws.
Fixed hinge assembly (see attached drawing Part No. MDAC350150)	6	Located 32-1/2" and 64" from sill of each panel to panel joint and at fixed jamb, secured to each stile and lateral frame at fixed jamb with two #8 x 1/2" Phillips pan head Tek screws
Adjustable lever (see attached drawing Part No. AC/35.01.129).	16	Located in lateral frame at jambs, screwed into frame approximately 4" from each end and 12" on center spacing for jamb adjustment.

**5.8 Reinforcement:** No reinforcement was utilized.

**5.9 Screen Construction:** No screen was utilized.

## 6.0 Installation:

The specimen was installed into a Pine wood buck. The rough opening allowed for a 1/4" shim space. The interior and exterior perimeters of the door were sealed with structural silicone sealant.

Location	Anchor Description	Anchor Location
Through compensation channel at head and jambs, through raised lower track and compensation channel at sill.	#10 x 1" Phillips flat head screw at head and jambs and #10 x 1-1/2" Phillips pan head screw at sill	2" from each corner and 12" on center spacing.



**7.0 Test Results:** The temperature during testing was 18°C (65°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
<b>Operating Force,</b> per ASTM E 2068	Initiate motion: 8.9 N (2 lbf) Maintain motion: 8.9 N (2 lbf) Locks: 31.1 N (7 lbf)	135 N (30 lbf) max. 90 N (20 lbf) max. 100 N (22.5 lbf) max.	
<b>Air Leakage,</b> Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	0.1 L/s/m <sup>2</sup> (0.01 cfm/ft <sup>2</sup> )	1.5 L/s/m <sup>2</sup> (0.3 cfm/ft <sup>2</sup> ) max.	1
<b>Water Penetration,</b> per ASTM E 547 at 140 Pa (2.92 psf)	N/A	N/A	2
<b>Uniform Load Deflection,</b> per ASTM E 330 Deflections taken at non-locking hinge stile +720 Pa (+15.04 psf) -720 Pa (-15.04 psf)	N/A	N/A	2
<b>Uniform Load Structural,</b> per ASTM E 330 Permanent sets taken at non- locking hinge stile +1080 Pa (+22.56 psf) -1080 Pa (-22.56 psf)	N/A	N/A	2
<b>Forced Entry Resistance,</b> per ASTM F 842, Type: A - Grade: 10	Pass	No entry	
<b>Forced Entry Resistance,</b> per AAMA 1304,	Pass	No entry	

## 7.0 Test Results: (Continued)

Optional Performance			
Title of Test	Results	Allowed	Note
<b>Water Penetration,</b> per ASTM E 547 at 150 Pa (3.13 psf)	Pass	No leakage	
<b>Uniform Load Deflection,</b> per ASTM E 330 Deflections taken at non-locking hinge stile +960 Pa (+20.05 psf) -960 Pa (-20.05 psf)	14.5 mm (0.57") 15.0 mm (0.59")	Report Only	3, 4, 5
<b>Uniform Load Structural,</b> per ASTM E 330 Permanent sets taken at non- locking hinge stile +1440 Pa (+30.08 psf) -1440 Pa (-30.08 psf)	0.3 mm (0.02") 0.5 mm (0.01")	9.4 mm (0.37") max. 9.4 mm (0.37") max.	4, 5

*Note 1: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.*

*Note 2: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.*

*Note 3: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

*Note 4: Loads were held for 10 seconds.*

*Note 5: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.*

Intertek-ATI will service this report for the entire test record retention period. Test records such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Intertek-ATI for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For Intertek-ATI

  
Digitally Signed by: Jarod Hardman

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Jarod S. Hardman  
Laboratory Manager

  
Digitally Signed by: Leaton Kirk

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Leaton Kirk  
Director – Regional Operations

JSH:ss

Attachments (pages): This report is complete only when all attachments listed are included.

- Appendix-A: Alteration Addendum (1)
- Appendix-B: Location of Air Seal (1)
- Appendix-C: Drawing (33)

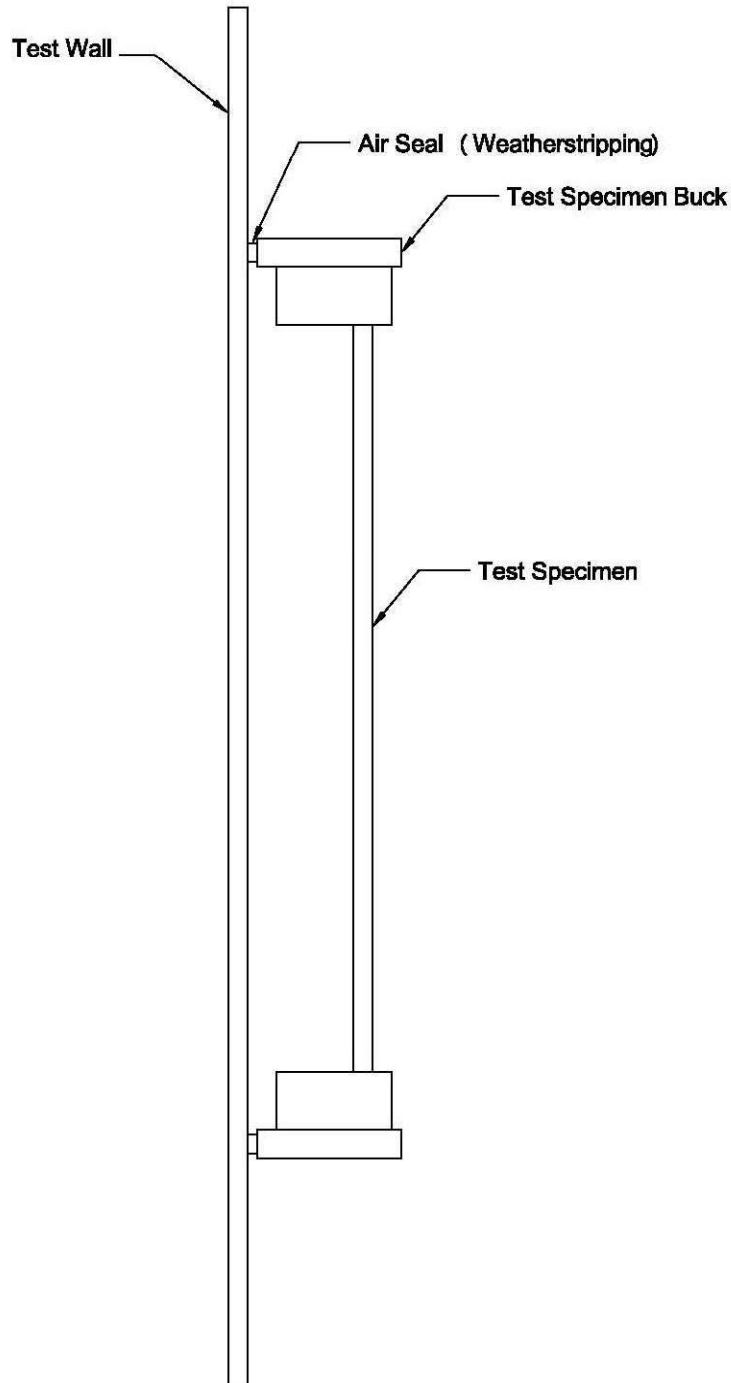
## **Appendix A**

### **Alteration Addendum**

**Alteration #1:** Date – 01/20/2015  
Cause for alteration – failure of locking hardware during structural loads  
Remedial action taken – locking rod in panels switched from hollow aluminum to 1/4-20 all thread and locking bolt attached to rod switched from cast aluminum to 4130 carbon steel.

### Appendix B

**Location of Air Seal:** The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.

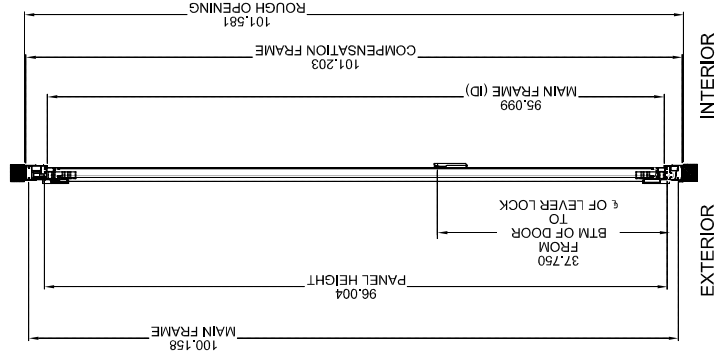
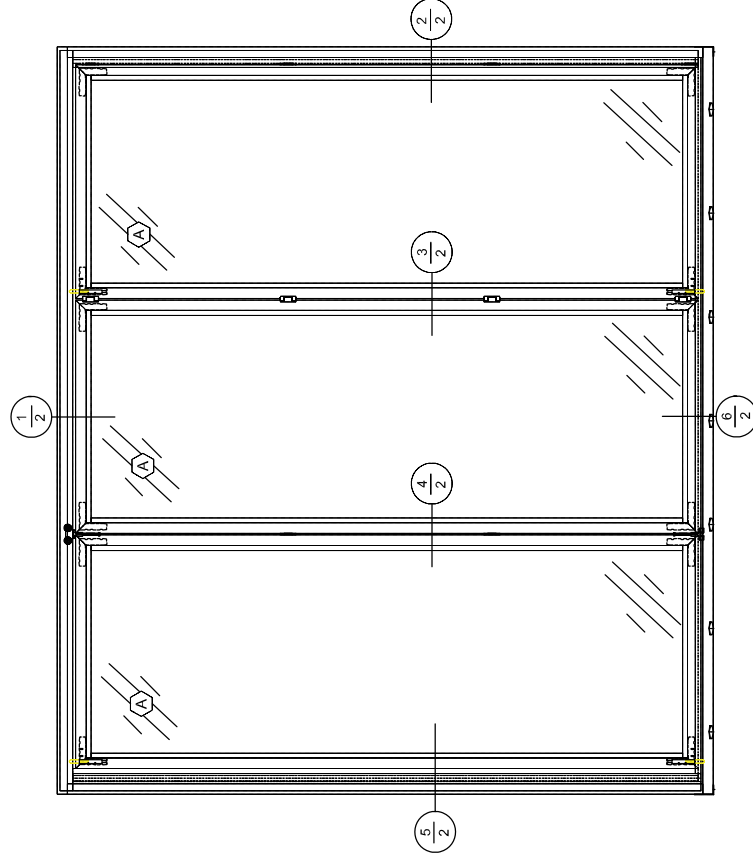




Test Report No.: E1588.01-301-47  
Report Date: 02/18/15

## **Appendix C**

### **Drawings**



# USE ALUMINUM

C.R. LAURENCE CO., INC.  
CRL MANUFACTURING  
2100 E. 38TH STREET  
LOS ANGELES, CA 90058

NOTE:  
1. PRODUCT TESTING & CERTIFICATION NUMBER: PTC394458  
(PRODUCT BEING TESTED: MONTEREY S55)

TITLE:	

DATE: 05 12 2014

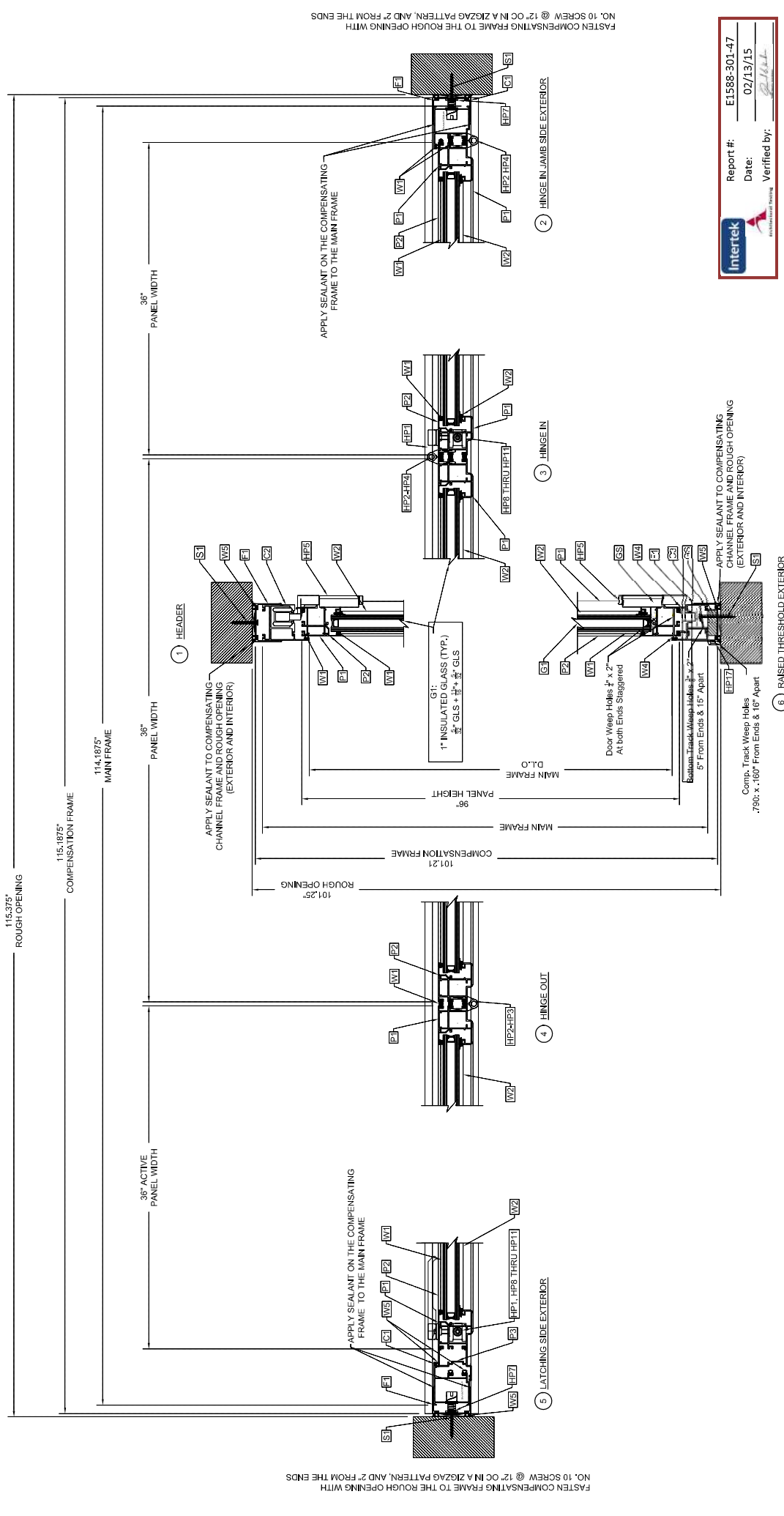
SCALE: 1:1

MONTEREY S55 OUT-SWING  
THREE PANEL W/ RAISED TRACK  
MOCK-UP DRAWING

DRAWING NO.

MU2014S55OS14201

1 OF 3



Report #: E1588-301-47  
Date: 02/13/15  
Verified by: [Signature]

C.R. LAURENCE CO., INC.  
CRL MANUFACTURING  
2100 E. 38TH STREET  
LOS ANGELES, CA 90058

REV.	DESCRIPTION	DATE	BY	DRAWN BY: MR	TITLE
					MONTEREY S55 OUT-SWING
					THREE PANEL W/ RAISED TRACK
					MOCK-UP DRAWING
					DRAWING NO.
					MU2014S55OS14201
					Sheet No.: 2 OF 3

NOTE:

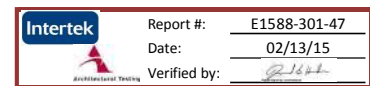
1. PRODUCT TESTING & CERTIFICATION NUMBER: PTC394458  
(PRODUCT BEING TESTED: MONTEREY S55)




ITEM #		PART NO	DESCRIPTION	QTY.
C1	MAIN FRAME	MD45003ML	S55 LATERAL FRAME	1
C2		MD45001ML	S55 TOP FRAME	1
C3		MD45002ML	S55 RAISED BOTTOM TRACK	2
				2
F1		MD45007ML	S55 COMPENSATION CHANNEL	1
	PANEL FRAME			1
P1		MD55006ML	S55 OUT SWING EXTRUSION	1
P2		MD22733ML	S55 GLASS STOP EXTRUSION	1
P3		MD4514ML	S55 JAMB EXTENDER	
S1	FASTENERS	SMS	NO. 10 X 1 1/2 " PAN HEAD SHEET METAL SCREW	1
S2		SMS	NO. 10 X 1 " FLAT HEAD SCREWS	1
S3		6X114PHPSMS	Pan Head Phillips Screw, 18-8 Stainless Steel, NO. 6 Size, 1-1/4" Length	1
S4		8X112LHPSMS	Extra-Large Diameter Head Screw #8 Size, 1-1/2" L	1
				1
W1	WTHR STRIP	WH3430012	BULB GASKET	1
W2		MDAC350217	S5S GLAZING GASKET	1
W3		MDCA350206	GASKET FOR EVEN HAND LEAVES	1
W4		MDAC350209	PRE-CHAMBER GASKET	1
W5		MDAC350203	SYSTEM VERTICAL LEAF, LATERAL FRAMES, EVEN "U" COMPENSATOR.	
G1	GLASS	GL103115129	1,000 INSULATED GLASS (.15625" + .6875" + .15625") TEMPERED	1
				1
				1
GS		MDAC3501118ML	GLAZING SUPPORT SHIMS	1
	HARDWARE			
HP1		MDAC350170EXTB	LARGE HANDLE CATCH ASM	1
HP2		MDAC350150B	MONTEREY FIXED HINGE	1
HP3		MDHP	PIN FOR HINGES	1
HP4		MDPLAS004B	HINGE SPACER	1
HP5		MDAC350153B	WHEEL RUNNER SYSTEM	
HP6		MDAC3501158B	COVER CAP FOR DOOR	1
HP7		MDAC3501129	ADJUSTABLE LEVER	1
HP8		1420TRSS316ASTMA193	316 SS Threaded Rod 1/4"-20 Thread, CUT TO LENGTH(TOP & BTM CATCH)	1
HP9		MDBOLT	UP/BTM CATCH BOLT	1
HP10		MDAC350182ML	ROD SPACER	1
HP11		MDAC350155	ROD END GUIDE	1
HP12		MDCORNERWBH	CORNER BLOCK W/ HOLE	1
HP13		MDCORNERW	CORNER BLOCK WIDE	1
HP14		MDAC350176	S55 MIDRAIL CLEAT	
HP15		MDAC350156ML	SHEAR BLOCK	
HP16		MDS55ENDDAM	DOOR SYSTEM END DAM	
HP17		MDWHCB	WEEP HOLE COVER	

## NOTE:

1. PRODUCT TESTING & CERTIFICATION NUMBER: PTC394458  
(PRODUCT BEING TESTED: MONTEREY S55)



				THIS DRAWING AND THE DESIGN SHOWN THEREIN IS THE PROPERTY OF C.R. LAURENCE CO. INC. AND USE OR COPIES THEREOF CANNOT BE MADE WITHOUT WRITTEN CONSENT.		 C.R. LAURENCE CO. INC. CRL MANUFACTURING 2100 E. 38TH STREET LOS ANGELES, CA 90058	
				DRAWN BY: MR	TITLE:	DRAWING NO.	
				DATE: 09.17.14	MONTEREY S55 OUT-SWING THREE PANEL W/ RAISED TRACK	MU2014S55OS14201	
				SCALE: NONE	BILL OF MATERIAL		
REV.	DESCRIPTION	DATE	BY				SHEET NO. 3 OF 3