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CR LAURENCE CO., INC.

MIAMI-DADE TEST REPORT

SCOPE OF WORK
TAS 201, TAS 202, AND TAS 203 TESTING ON IW8200 HORIZONTAL SLIDING WINDOW

REPORT NUMBER
H0916.01-303-44 R0

TEST DATES
05/01/17 – 05/18/17

ISSUE DATE **REVISION DATE**
10/16/17 10/23/17

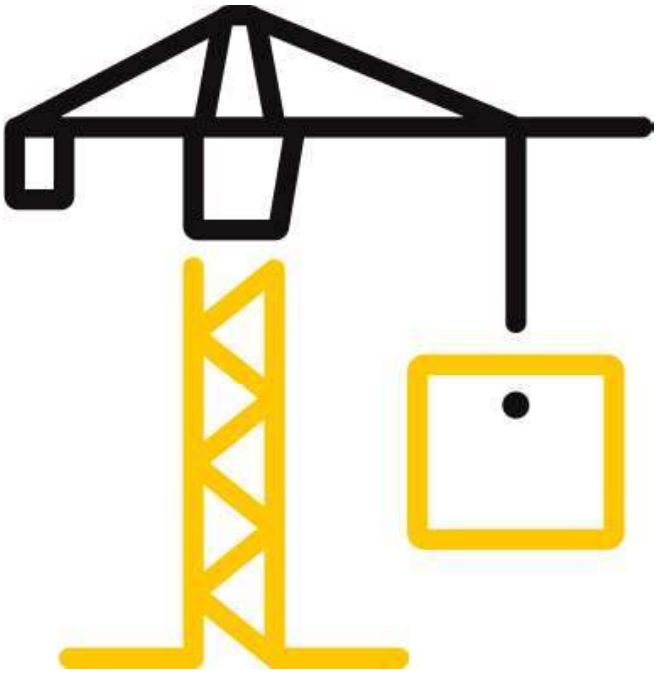
RECORD RETENTION END DATE
05/18/27

MIAMI-DADE COUNTY NOTIFICATION NO.
ATI-LA17004

LABORATORY CERTIFICATION NO.
16-0421.01

PAGES
48

DOCUMENT CONTROL NUMBER
ATI 00651 (07/24/17)
RT-R-AMER-Test-2816



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TEST REPORT FOR CR LAURENCE CO., INC.
Report No.: H0916.01-303-44 R0
Date: 10/10/17

REPORT ISSUED TO

CR LAURENCE CO., INC.
2503 E. Vernon Avenue
Los Angeles, California 90058

SECTION 1

SCOPE

Intertek Building & Construction (B&C) was contracted by CR Laurence Co., Inc.to perform TAS 201, TAS 202, and TAS 203 testing in accordance with Miami-Dade County requirements on their IW8200, Horizontal Sliding Window. Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at the Intertek B&C test facility in Lake Forest, California. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2

SUMMARY OF TEST RESULTS

The specimens tested met the performance requirements set forth in the protocols.

Product Type: Horizontal Sliding Window
Series/Model: IW8200

SPEC.	TEST PROTOCOL	DESIGN PRESSURE
1	TAS 202	+100 / -100 psf
1	TAS 201/203 (Large Missile)	+100 / -100 psf
2	TAS 201/203 (Large Missile)	+100 / -100 psf
3	TAS 201/203 (Large Missile)	+100 / -100 psf

2017.10.26 10:43:25 -07'00'

For INTERTEK B&C:

COMPLETED BY:	Jarod S. Hardman	**REVIEWED BY:**	Tyler Westerling, P.E.
TITLE:	Laboratory Manager	**TITLE:**	Senior Project Engineer
SIGNATURE:	Digitally Signed by: Jarod Hardman	**SIGNATURE:**	Digitally Signed by: Tyler Westerling
DATE:	10/23/17	**DATE:**	10/23/17

JSH:ss/ms

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SECTION 3
TEST METHOD(S)

The specimens were evaluated in accordance with the following:

TAS 201-94, *Impact Test Procedures*

TAS 202-94, *Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure*

TAS 203-94, *Criteria for Testing Products Subject to Cyclic Wind Pressure Loading*

SECTION 4
MATERIAL SOURCE/INSTALLATION

Test specimens were provided by the client. Representative samples of the test specimen(s) will be retained by Intertek B&C for a minimum of ten years from the test completion date.

Then specimen was installed into a Spruce-Pine-Fir wood test buck. The rough opening allowed for a 1/4" shim space. The interior and exterior perimeter of the window was sealed with sealant. Installation of the tested product was performed by the client.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Through frame	#10 x 3-1/2" Phillips flat head screws	Approximately 12" on center spacing

SECTION 5
EQUIPMENT

Cannon: Constructed from steel piping utilizing compressed air to propel the missile
Missile: 2x4 Southern Pine
Timing Device: Electronic beam type
Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device
Deflection Measuring Device: Linear transducers

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SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Charles Presley	Intertek B&C
Jarod S. Hardman	Intertek B&C

SECTION 7
TEST SPECIMEN DESCRIPTION

Product Type: Horizontal Sliding Window
Series/Model: IW8200

Product Sizes:

OVERALL AREA:	WIDTH		HEIGHT	
2.75 m^2 (29.58 ft^2)	millimeters	inches	millimeters	inches
Overall Size	1803	71	1524	60
Sash	921	32-1/4	1410	55-1/2

Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Head	Aluminum	Thermally broken head extrusion, Part No. HS862.
Head	PVC	Vent stop, Part No. WH853, press fit into head extrusion.
Head	PVC	Anti-lift, Part No. WH852, press fit into head extrusion.
Head	PVC	Head isolator strut, Part No. WH838, press fit onto head extrusion center leg.
Sill	Aluminum	Thermally broken sill extrusion, Part No. HS863.
Sill	Aluminum	Thermally broken sill insert, Part No. HS804, snap fit on top of sill extrusion and secured with #8 x 3/4" flat head screws.
Sill	PVC	Sill isolator strut, Part No. WH841, press fit onto sill insert at center leg.
Sill	Aluminium	Screen frame, Part No. HS835, snap fit into sill insert in front of active sash.

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TEST REPORT FOR CR LAURENCE CO., INC.
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Date: 10/10/17

Frame Construction (Continued):

FRAME MEMBER	MATERIAL	DESCRIPTION
Jambs	Aluminum	Thermally broken jamb extrusion, Part No. HS864.
Active Jamb	Aluminum	Exterior frame cover, Part No. HS836, snap fit onto jamb extrusion at active sash jamb.
Jambs	PVC	Jamb isolator strut, Part No. WH809, press fit over jamb extrusion center leg.
Fixed Jamb	Aluminum	Picture window cover, Part No. PW803, snap fit into jamb extrusion.
Interlock	Aluminum	Mullion extrusion, Part No. SH866.
	JOINERY TYPE	**DETAIL**
All Corners	Flush	Secured through jambs into head and sill with two #10 x 1" hex head screws.

Sash Construction:

SASH MEMBER	PART #	MATERIAL	DESCRIPTION
Top Rail	WH843	Aluminum	Thermally broken sash rail extrusion.
Jamb Stile	HS815	Aluminum	Thermally broken sash stile extrusion.
Interlock	HS854	Aluminum	Thermally broken sash interlock extrusion.
Bottom Rail	HS813	Aluminum	Thermally broken sash rail extrusion.
Bottom Rail	WH843	PVC	Bottom rail isolator, press fit into bottom rail.
	JOINERY TYPE		**DETAIL**
All Corners	Flush		Secured through stiles with one #10 x 1" hex head screw.

Reinforcement: *No reinforcement was utilized.*

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Report No.: H0916.01-303-44 R0
Date: 10/10/17

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
PC Guide, Part No. NP942	1 row	Inserted into innermost leg of framing at head, sill, and active jamb
Grey Soft Touch, 0.270" x 0.250", Part No. W-027	1 row	Inserted into interior face of head, sill, and active jamb isolator struts.
Grey Soft Touch, 0.270" x 0.250", Part No. W-027	1 row	Inserted into interior face of fixed interlock member.
Grey Soft Touch, 0.270" x 0.250", Part No. W-027	1 row	Inserted into exterior face of sash interlock member.

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	OVERALL THICKNESS	GLASS MAKEUP	GLAZING METHOD
GL-1	1-7/32"	1/4" heat-strengthened glass 1/2" air space 3/16" heat-strengthened glass 0.090" SGP interlayer 3/16" heat-strengthened glass	Dry glazed with EPDM sponge gasket Part No. NP881 at interior and EPDM wedge gasket Part No. WH344 pressed into glazing stop Part No. SH884 at exterior. Glazing set on two setting blocks per lite, Part No. S8883.

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LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Sash	1	801 x 1294	31-17/32 x 50-15/16	5/8"
Fixed	1	801 x 1294	31-17/32 x 50-15/16	5/8"

Drainage:

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weep Hole w/ Cover (Part No. WH276)	1-3/4" wide by 1/4" high	2	Through exterior face of sill extrusion at base of system, 6" from each jamb.

Hardware:

DESCRIPTION	QUANTITY	LOCATION
Auto Lock Hardware Set	1	Located mid-span of sash interlock.
Keeper	1	Secured directly opposite auto lock on fixed interlock.

Screen Construction: *No screen was utilized.*

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SECTION 8
TEST RESULTS

Protocol TAS 202-94, *Static Air Pressure*

Test Dates: 05/01/17 through 05/18/17
The temperature during testing was 31°C (88°F). The results are tabulated as follows:

Test Specimen #1

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Air Leakage, Infiltration per TAS 202 at 1.57 psf (25 mph)	0.8 L/s/m^2 (0.15 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2) max.	1
Air Leakage, Infiltration per TAS 202 at 6.24 psf (50 mph)	1.5 L/s/m^2 (0.29 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2) max.	1

Test Specimen #1: Preload and Design Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+50.13 50% of Test Pressure	1	0.11	N/A	0.01	N/A
	2	0.15	N/A	0.00	N/A
	3	0.09	N/A	0.01	N/A
+100.3 Design Pressure	1	0.17	N/A	0.01	N/A
	2	0.32	N/A	0.01	N/A
	3	0.22	N/A	0.01	N/A
-50.13 50% of Test Pressure	1	0.10	N/A	0.03	N/A
	2	0.21	N/A	0.04	N/A
	3	0.17	N/A	0.09	N/A
-100.3 Design Pressure	1	0.21	N/A	0.02	N/A
	2	0.42	N/A	0.03	N/A
	3	0.29	N/A	0.04	N/A

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Date: 10/10/17

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Water Penetration, per TAS 202 15% of Positive Design Pressure at 580 Pa (12.11 psf)	Pass	No leakage	
Forced Entry Resistance, per ASTM F 588	Pass	No entry	

Note 1: *Test Date 05/05/17 / Time 09:00 AM*

Test Specimen #1: Structural Overload Load per TAS 202

LOAD (psf)	INDICATOR LOCATION	DEFLECTION (in.)		PERMANENT SET (in.)	
		MEASURED	ALLOWED	MEASURED	ALLOWED
+150.4 Test Pressure	1	0.22	N/A	0.02	N/A
	2	0.50	N/A	0.05	N/A
	3	0.36	N/A	0.08	N/A
-150.4 Test Pressure	1	0.33	N/A	0.03	N/A
	2	0.67	N/A	0.03	N/A
	3	0.47	N/A	0.05	N/A

Note 2: *Positive and negative uniform static load test loads were held for 30 seconds.*

Note 3: *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.*

Note 4: *See Sketch #1 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement.*

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TEST REPORT FOR CR LAURENCE CO., INC.
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Date: 10/10/17

Protocol TAS 201-94, *Large Missile Impact Procedures*

Test Dates: 05/01/17 through 05/18/17

The temperature during testing was 31°C (88°F). The results are tabulated as follows:

Test Specimen #1

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
Lower right corner of active	9.5	96	49.5
Center of active	9.5	96	49.8

Test Specimen #2

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
Center of active	9.5	96	50.1
Upper left corner of active	9.5	96	49.6

Test Specimen #3

IMPACT #	MISSILE WEIGHT (lbs.)	MISSILE LENGTH (in.)	MISSILE VELOCITY (ft./sec.)
Center of active	9.5	96	49.5
Lower right corner of active	9.5	96	49.5

Note 5: *See Sketch #2 for impact locations.*

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TEST REPORT FOR CR LAURENCE CO., INC.
Report No.: H0916.01-303-44 R0
Date: 10/10/17

Protocol TAS 203-94, *Cyclic Wind Pressure Loading*

Test Dates: 05/01/17 through 05/18/17

The temperature during testing was 31°C (88°F). The results are tabulated as follows:

Test Specimen #1: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	**STAGE**			
+100.3 / 100.3 psf	**1**	**2**	**3**	**4**
POSITIVE PRESSURE RANGE (psf)	20 - 50	0 - 60	50 - 80	30 - 100
AVERAGE CYCLE TIME (sec.)	1.82	2.56	1.94	2.06
NUMBER OF CYCLES	3500	300	600	100
	5	**6**	**7**	**8**
NEGATIVE PRESSURE RANGE (psf)	30 - 100	50 - 80	0 - 60	20 - 50
AVERAGE CYCLE TIME (sec.)	3.02	2.21	2.61	2.11
NUMBER OF CYCLES	50	1050	50	3350

Test Specimen #2: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	**STAGE**			
+100.3 / 100.3 psf	**1**	**2**	**3**	**4**
POSITIVE PRESSURE RANGE (psf)	20 - 50	0 - 60	50 - 80	30 - 100
AVERAGE CYCLE TIME (sec.)	1.85	2.53	2.69	2.00
NUMBER OF CYCLES	3500	300	600	100
	5	**6**	**7**	**8**
NEGATIVE PRESSURE RANGE (psf)	30 - 100	50 - 80	0 - 60	20 - 50
AVERAGE CYCLE TIME (sec.)	2.81	3.17	2.63	2.41
NUMBER OF CYCLES	50	1050	50	3350

Test Specimen #3: Cyclic Test Spectrum and Average Cycle Time per TAS 203

DESIGN PRESSURE	**STAGE**			
+100.3 / 100.3 psf	**1**	**2**	**3**	**4**
POSITIVE PRESSURE RANGE (psf)	20 - 50	0 - 60	50 - 80	30 - 100
AVERAGE CYCLE TIME (sec.)	1.82	2.37	2.03	2.11
NUMBER OF CYCLES	3500	300	600	100
	5	**6**	**7**	**8**
NEGATIVE PRESSURE RANGE (psf)	30 - 100	50 - 80	0 - 60	20 - 50
AVERAGE CYCLE TIME (sec.)	3.72	2.89	3.20	2.51
NUMBER OF CYCLES	50	1050	50	3350

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SECTION 9
CONCLUSIONS

The large missiles impacted each intended target. Each impact location was carefully inspected. No signs of penetration, rupture, or opening after the large missile impact test were observed; as such, each test specimen satisfies the large requirements of TAS 201. Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

AND

No signs of failure were observed in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of TAS 202. Upon completion of testing, specimens tested for TAS 202-94 met the requirements of Section 1620 of the Florida Building Code, Building.

AND

No signs of failure were observed in any area of the test specimens during the cyclic load test; as such, the test specimens satisfy the cyclic load requirements of TAS 203. Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1626 of the Florida Building Code, Building.

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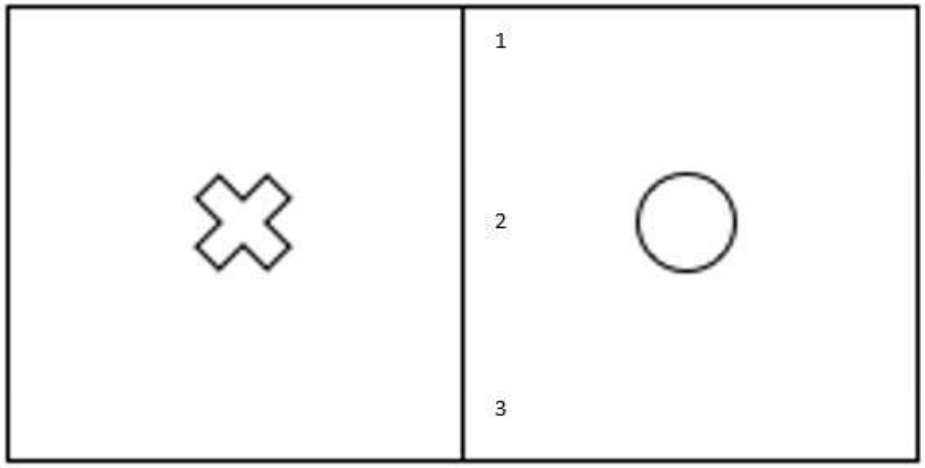
Report No.: H0916.01-303-44 R0
Date: 10/10/17

SECTION 10
SKETCHES



Sketch No. 1
TAS 202 Indicator Locations

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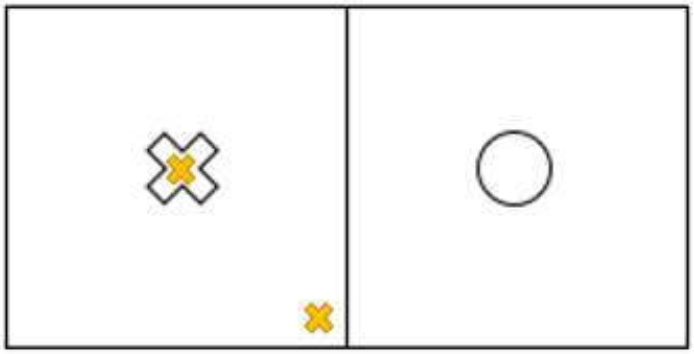
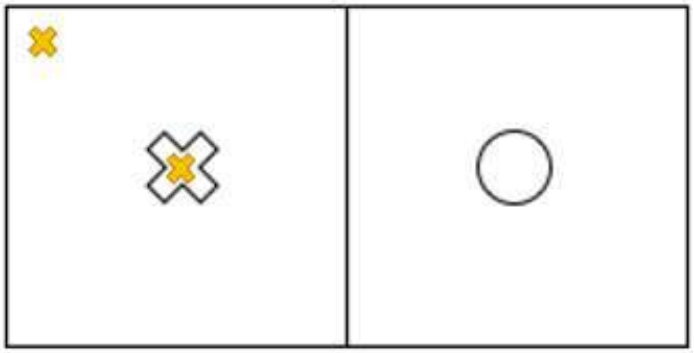


Test Specimen #1



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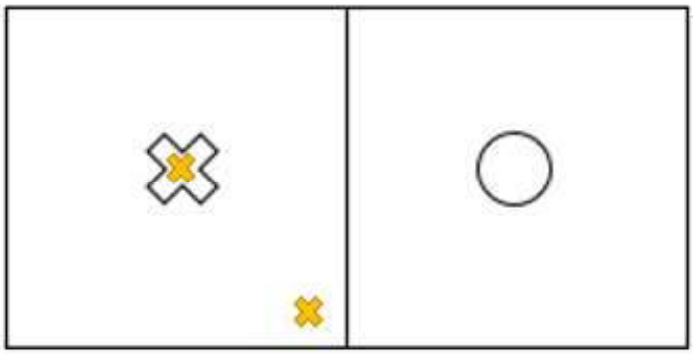

Test Specimen #3

Sketch No. 2
TAS 201 Impact Locations

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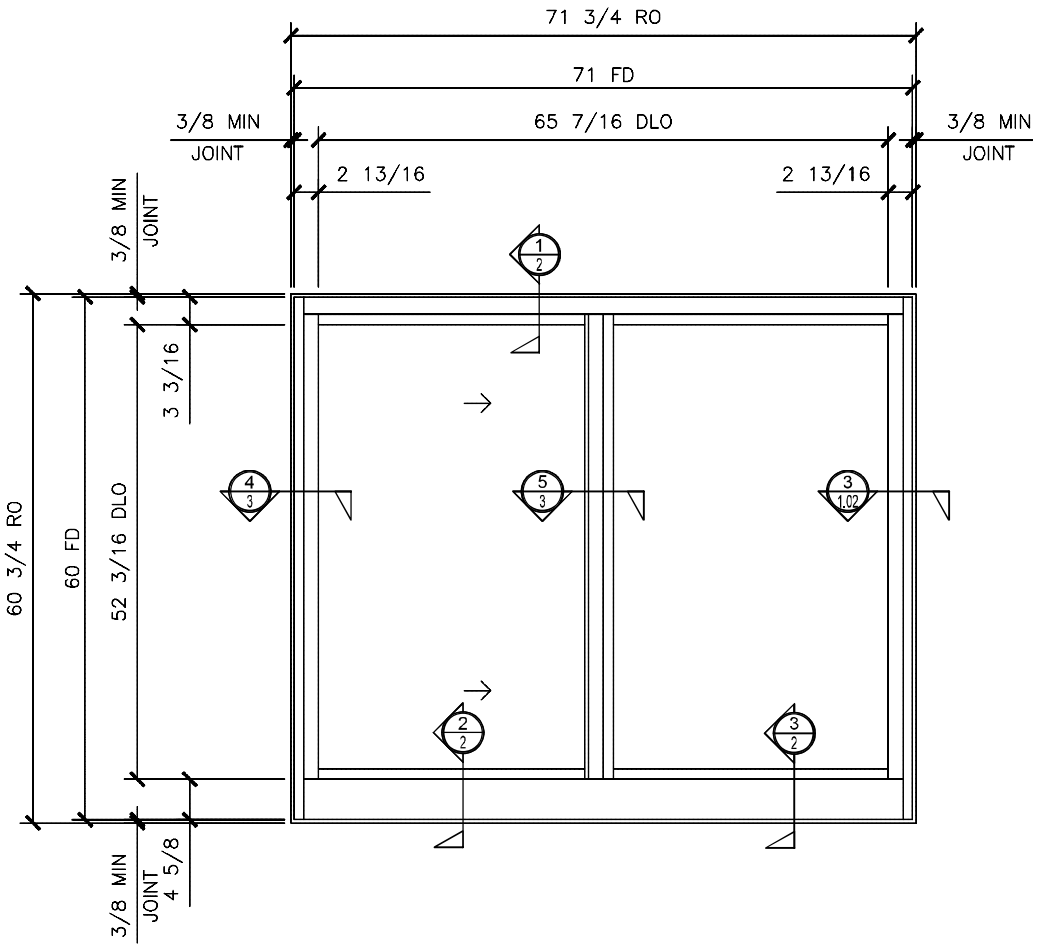
SECTION 11
DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.



SERIES IW8200 HOR. SLIDER ELEVATION

ITEM		PT. NO.	PART DESCRIPTION	
C1	FRAME & SASH COMPONENTS	HS862	HEAD EXTRUSION	
C2		HS864	JAMB EXTRUSION	
C3		HS864	VENT STILE EXTRUSION	
C4		HS815	VENT STILE EXTRUSION	
C5		PW803	PICTURE WINDOW COVER	
C6		HS804	SILL INSERT	
C7		HS811	VENT HEAD EXTRUSION	
C8		HS863	SILL EXTRUSION	
C9		SH884	GLAZING STOP	
C10		SH866	MULLION EXTRUSION	
C11		HS836	EXTERIOR FRAME COVER	
C12		WH852	ISOLATOR STRUT	
C13		WH853	ISOLATOR STRUT	
C14		WH841	ISOLATOR STRUT	
C15		WH809	ISOLATOR STRUT	
C17		HS813	BOTTOM RAIL EXTRUSION	
C18		WH843	ISOLATOR STRUT	
C19		HS835	SCREEN FRAME @ SILL (SNAP-IN)	
C20		HS854	INTERLOCKER,H-SLDR	
G1	GLAZING		.025 X .050 X (.1875 X .090 SGP X .1875) INSULATED GLASS (HEAT STRENGHTENED) ALUMINUM SPACER DUAL GLAZED	
G2		NP881	SPONGE GASKET-EDPM	
G3		WH344	WEDGE GASKET-EDPM	
G4		NP942	PC GUIDE	
G5		SB883	SETTING BLOCK	
G6		W-027	DUST GASKET	
H1	HARDWARE	10X1HWSMS	#10 X 1" HEX WASHER HEAD SCREWS	
H2		10X312FHPWS	#10 X 3-1/2" FLAT HEAD PHILLIPS WOOD SCREWS	
H3		WH354	LOCK HARDWARE	
H4		WH3807	KEEPER	
H5		WH276	WEEP HOLE COVER	
S1		EF12C	CRL 3/8" CLOSED CELL BACKER ROD	
S2		795BL	DOW CORNING-795 SILICONE BUILDING SEALANT	

TEST REQUIREMENTS

AIR INFILTRATION:
<0.30 CFM/SQ.FT. @1.57 CFM

STATIC WATER:
12 PSF

DEFLECTION:
DP100

STRUCTURAL OVERLOAD:
150 PSF

TESTING SEQUENCE:
Air
Water
Deflection
Overload
Impact & Cycle Test

REVISIONS

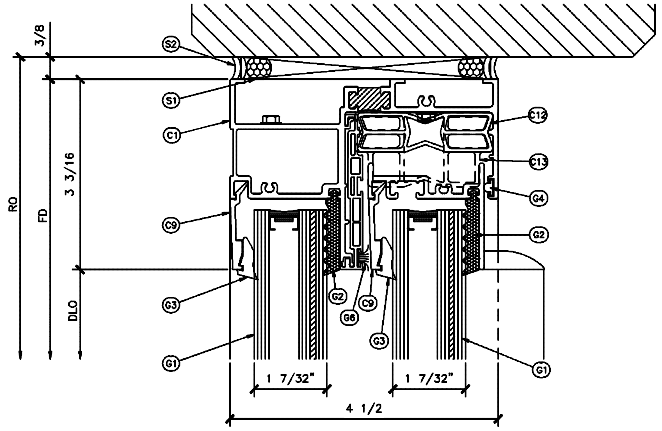
C.R.LAURENCE CO.
ARCHITECTURAL PRODUCTS
2100 E. 38TH Street, Los Angeles, CA 90058
www.crlaurence.com

Job Name:
SERIES IW8200
HURRICANE RESISTANT
HORIZONTAL SLIDER

Glazing Contractor:

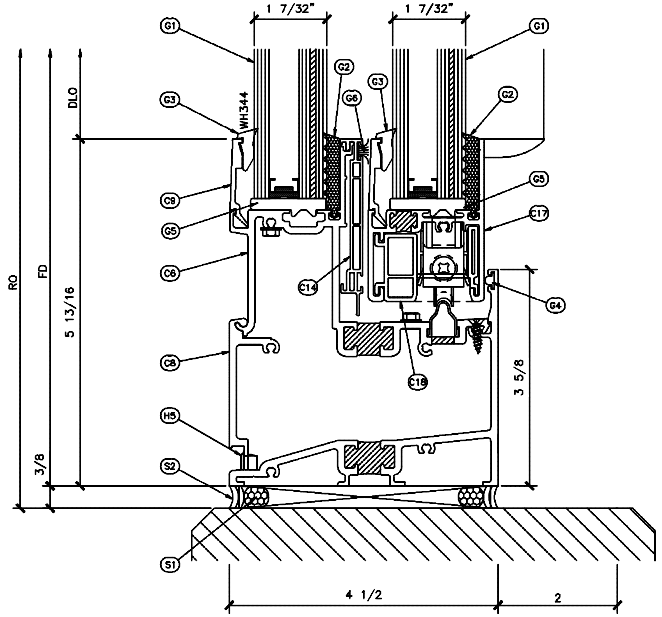
DATE: 08.07.2017
DRAWN BY: GDO
CHECKED BY: XX
SCALE: AS SHOWN
JOB #: PTC464021

SHT 1 OF 3



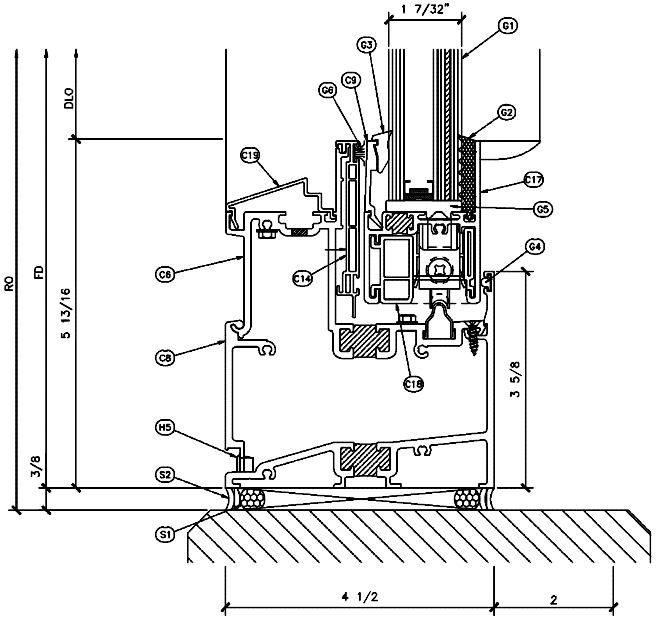
1 SECTION DETAIL AT HEAD

ARCH REF: N/A 1'-0"=1'-0"



2 SECTION DETAIL AT SILL

ARCH REF: N/A 1'-0"=1'-0"



3 SECTION DETAIL AT SILL

ARCH REF: N/A 1'-0"=1'-0"

REVISIONS

C.R.LAURENCE CO.
ARCHITECTURAL PRODUCTS
2100 E. 38TH Street, Los Angeles, CA 90058
www.crlaurence.com

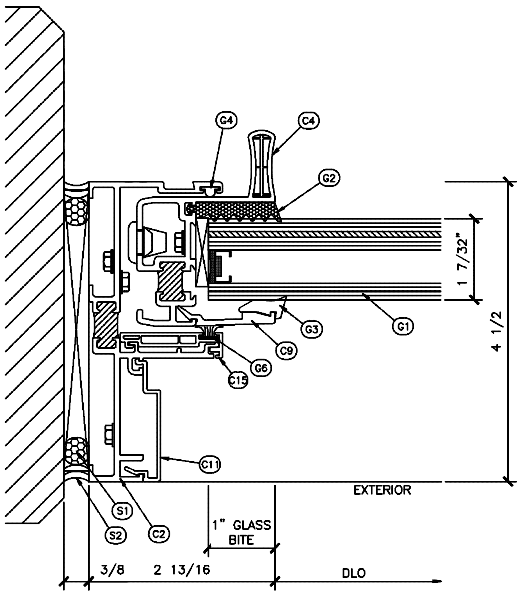
Job Name:

SERIES IW8200
HURRICANE RESISTANT
HORIZONTAL SLIDER

Glazing Contractor:

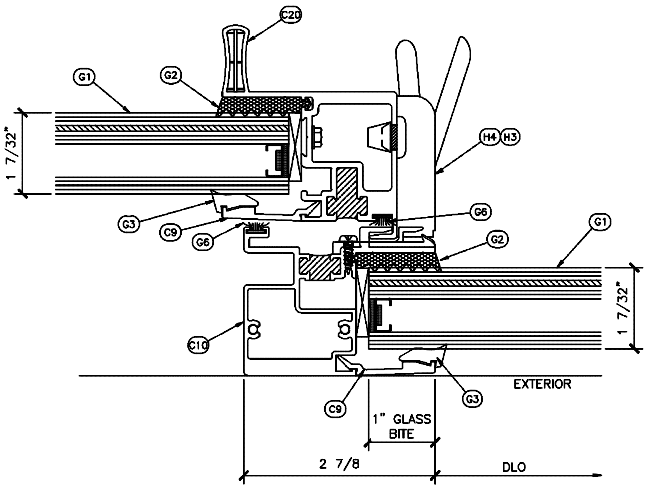
DATE:	08.07.2017
DRAWN BY:	GDO
CHECKED BY:	XX
SCALE:	AS SHOWN
JOB #:	PTC464021

SHT 2 OF 3



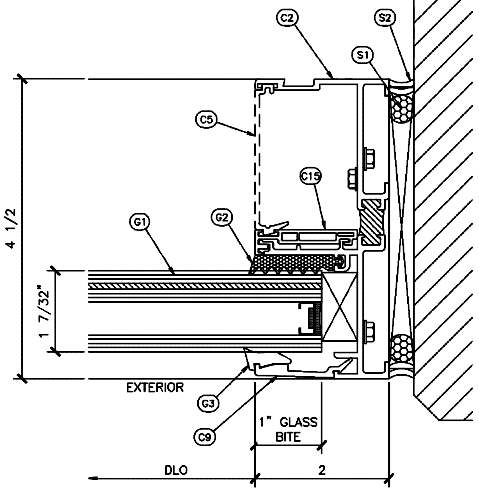
4 SECTION DETAIL AT JAMB

ARCH REF: N/A 1'-0"=1'-0"



5 SECTION DETAIL AT JAMB

ARCH REF: N/A 1'-0"=1'-0"



6 SECTION DETAIL AT JAMB

ARCH REF: N/A 1'-0"=1'-0"

REVISIONS

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