

MIAMI-DADE COUNTY PERFORMANCE TEST REPORT

Report No.: C3787.02-401-18

Rendered to:

CORAL ARCHITECTURAL PRODUCTS Tuscaloosa, Alabama

PRODUCT TYPE: Thermally Broken Impact Storefront IG **SERIES/MODEL**: FL 550T(DG) Thermal Flush Glaze-IG

This report contains in its entirety:

Cover Page:1 pageReport Body:12 pagesSketches:2 pagesDrawings:7 pages

Test Start Date:	3/21/2013
Test End Date:	3/21/2013
Revision 1 Date:	8/22/2013
Report Date:	8/21/2013
Test Record Retention End Date :	8/21/2023
Miami-Dade County Notification No.:	ATI FL 12015



1.0 Client Identification:

1.1 Report Issued To:	Coral Architectural Products 3010 Rice Mine Road Tuscaloosa, Alabama 35406
1.2 Contact Person:	William Smith, SR
2.0 Laboratory Identification:	
2.1 Test Laboratory:	Architectural Testing, Inc. 2250 Massaro Boulevard Tampa, Florida 33619
2.2 Laboratory Phone Number:	813-628-4300

3.0 Project Summary:

3.1 Introduction: Architectural Testing, Inc. was contracted by Coral Architectural Products to conduct TAS 201, TAS 202, and TAS 203 testing on their FL 550T(DG) Thermal Flush Glaze-IG storefront in accordance with Florida Building Code for High Velocity Hurricane Zone and Miami-Dade County requirements. The three specimen(s) tested met the performance requirements set forth in the protocols. The results are summarized in Table 1.

Specimen #	Test Protocol	Design Pressure	
1	TAS 202	Water only (15.04 psf)	
1, 3 and 4	TAS 201 / 203	+60.0 / -60.0 psf	
1, 5 ана 4	(Small Missile)	+00.07 -00.0 psi	

- 3.2 Product Type: Thermally Broken Impact Storefront IG
- **3.3 Series/Model**: FL 550T(DG) Thermal Flush Glaze-IG
- 3.4 Miami-Dade County Notification No.: ATI 12015
- 3.5 Test Date: 3/21/2013
- 3.6 Test Record Retention End Date: 8/21/2023
- 3.7 Test Location: Architectural Testing, Inc. test facility in Tampa, Florida



3.0 Project Summary: (Continued)

- **3.8 Test Specimen Source**: The test specimen(s) were provided by the client. Representative samples of the test specimen(s) will be retained by Architectural Testing for a minimum of ten years from the report completion date.
- **3.9 Drawing Reference**: The test specimen drawings have been reviewed by Architectural Testing and are representative of the test specimen(s) reported herein. Test specimen construction was verified by Architectural Testing per the drawings located in Appendix C. Any deviations are documented herein and on the drawings.

3.10 List of Official Observers:

<u>Name</u>

<u>Company</u>

William Smith	Coral Architectural Products
Daniel P. White	Architectural Testing, Inc.
Shawn G. Collins, P.E.	Architectural Testing, Inc.
John C. McClane	Architectural Testing, Inc.

4.0 Test Protocol(s):

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

5.0 Test Specimen Description:

5.1 Product Sizes: Table 2 provides product sizes for the overall test specimen(s) and operable components.

Overall Area : 109.8 ft ²	Width (in.)	Height (in.)	
Overall size	146.5	108	

Table 2: Overall Specimen and Operable Component Sizes



5.0 Test Specimen Description: (Continued)

5.2 Frame Construction: The frame was fabricated utilizing the members listed in Table 3.

Frame Member	Part #	Material	Description
Sub-sill	FL539T	Extruded	Detail #6 on sheet #4 of #7
5ub-siii	FL3391	aluminum	Detail #0 off sheet #4 of #7
Sill	FL572T	Extruded	Detail #6 on sheet #4 of #7
5111	FL5/21	aluminum	Detail #6 off sheet #4 of #7
Head	FL572T	Extruded	Detail #4 on sheet #4 of #7
пеац	FL5721	aluminum	Detail #4 off sheet #4 of #7
Left jamb	FL571T/	Extruded	Detail #8 on sheet #5 of #7
Left Jailib	FL515-1	aluminum	Detail #8 off sheet #3 of #7
Dightiomh	FL574T/	Extruded	Detail #9 on sheet #5 of #7
Right jamb	FL575T	aluminum	Detail #9 off sheet #5 of #7
Vertical	FL574T/	Extruded	Detail #7 on sheet #5 of #7
mullions	FL575T	aluminum	Detail #7 off sheet #5 of #7

Table 3.	Frame Member Details
Table J.	Frame Member Details

5.2.1 Frame Corner Construction: The frame corners were constructed as described in Table 4.

Location	Joinery Type	Details		
All verticals to sill	Mechanically fastened	Square-cut, butted, secured through the vertical into the horizontal screw bosses with (2) #14 x 1" HHSTS and sealed with butyl tape and sealed at the exterior with Dow Corning 995 silicone.		
All verticals to head	Mechanically fastened	Square-cut, butted, secured through the vertical into the horizontal screw bosses with (2) $#14 \times 1-1/2"$ pan head sheet metal screws and sealed with butyl tape and sealed at the exterior with Dow Corning 995 silicone.		

 Table 4: Frame Corner Construction Details



5.0 Test Specimen Description: (Continued)

5.3 Reinforcement: No reinforcement was utilized

5.4 Weatherstripping: Table 5 provides details of the weatherstripping utilized in each test specimen.

Description	Quantity	Location	
Part #NG1; EPDM, flexible	1 Row	Exterior perimeter of each lite; vertical	
glazing wedge gasket.	1 KOW	mullions, and glass stops	
Part #NG15; EPDM, flexible	1 Row	Interior perimeter of each lite; and	
glazing gasket	1 KOW	vertical mullions, at the glazing pockets	

Table 5: Weatherstripping Details

5.5 Glazing Details:

5.5.1 Glazing Materials: Table 6 describes the glass utilized for testing.

Glass Type	Overall Thickness	Glass Makeup	Glazing Method	
	1-5/16"	1/4" tempered glass 1/2" air space	Interior glazed onto an exterior perimeter vinyl gasket Part#NG15, secured with snap-	
IA I.G. Laminated	1/4" tempered glass 0.035" SG® by DuPont interlayer 1/4" tempered glass	in glass stops at the horizontal frame member of each lite. The interior perimeter of each lite utilized a vinyl wedge gasket; Part#NG1.		

Table 6: Glazing Details

5.5.2 Daylight Opening and Glass Bite: Table 7 provides the daylight opening and glass bite utilized for testing.

T-1-1-7	Derelialer	O	Cine and	Class	Bite Details
Table /	navnont	Unening	NIZES and	1-1255	BITE DETAILS
rubic / .	Duyingine	opening	ondeo unu	ulubb	Dite Details

Glass Type	Location	Quantity	Daylight Opening	Glass Bite
IA	Left, right and center lite	3 total	45-1/2" x 102-3/8"	9/16"



5.0 Test Specimen Description: (Continued)

5.6 Drainage: Table 8 provides details of drainage holes and accessories utilized for testing.

Table 6. Dramage Details				
Drainage Method	Size	Quantity	Location	
Weepholes	3/8" diameter	6	Sub-sill; 10" from each jamb and 8" from each side of vertical mullions	

- Table 8: Drainage Details
- **5.7 Hardware**: No hardware was utilized.
- **5.8 Installation**: Table 9 provides details of the test specimen installation into the C10 steel test buck with welded corners. The rough opening allowed for a 1/2" shim space. The interior and exterior perimeter of the test specimen was sealed with Dow Corning 795 silicone. Metal to metal joints and metal to glass at all corners was sealed with Dow Corning 995 silicone.

Location	Anchor Description	Anchor Location
Sub-sill	#14 x 1-1/2" tek screws	4" from each end and 48" on
5ub-Sili	#14 x 1-1/2 tek screws	center into the steel test buck
	#14 x 1/2" pan head sheet metal	4" and 6" from the jambs and 2"
Sill	screws	and 4" each side of the vertical
		mullions into the sub sill only
		2" and 4" from the jambs and
Head	#14 x 1-1/2" tek screws	each side of the vertical
		mullions into the test buck

Table 9: Installation Details



6.0 Test Results: The temperature during TAS 202 testing was 69.3°F. Results are tabulated as follows:

6.1 Protocol TAS 202-94, Static Air Pressure

Table 10 provides the results for the water penetration test.

Table 10: Test Specimen #1 TAS 202, Water Penetration Test Results				
Title of Test	Pressure	Results		
Water Penetration	1E04 pcf	Dees		
15% of Positive Design Pressure	15.04 psf	Pass		

Conclusion: Architectural Testing observed no signs of water infiltration in any area of the test specimen during the TAS 202 testing; as such, the test specimen satisfies the requirements of the water infiltration portion of TAS 202.



6.0 Test Results: The temperature during TAS 201 testing was 69.3°F. Results are tabulated as follows:

6.2 Protocol TAS 201-94, Small Impact Procedures

Tables 11, 12 and 13 provides the results for the small missile impact test.

Impact #	Missile Weight	Missile Velocity	Observations
	(grams)	(ft./sec.)	
			Missile hit impact area;
1	10	132.9	fractured glass. No fracture to
			interior laminated lite
			Missile hit impact area;
2	10	132	fractured glass. No fracture to
			interior laminated lite
			Missile hit impact area;
3	10	131	fractured glass. No fracture to
			interior laminated lite

 Table 11: Test Specimen #1 TAS 201, Small Missile Impact Test Results

Table 12: Test Specimen #2 TAS 201, Small Missile Impact Test Results

Impact #	Missile Weight (grams)	Missile Velocity (ft./sec.)	Observations
1	10	129.4	Missile hit impact area; fractured glass. No fracture to interior laminated lite
2	10	130.1	Missile hit impact area; fractured glass. No fracture to interior laminated lite
3	10	131.1	Missile hit impact area; fractured glass. No fracture to interior laminated lite



6.0 Test Results: (Continued)

Impact #	Missile Weight (grams)	Missile Velocity (ft./sec.)	Observations
			Missile hit impact area;
1	10	131.4	fractured glass. No fracture to
			interior laminated lite
			Missile hit impact area;
2	10	130.0	fractured glass. No fracture to
			interior laminated lite
			Missile hit impact area;
3	10	129.2	fractured glass. No fracture to
			interior laminated lite

Table 13: Test Specimen #3 TAS 201, Small Missile Impact Test Results

Note: See Architectural Testing Sketch #1 for impact locations.

Conclusion: The small missiles impacted each intended target and Architectural Testing carefully inspected each impact location. Architectural Testing observed no signs of penetration, rupture, or opening after the small missile impact test; as such, each test specimen satisfies the small missile requirements of TAS 201.



6.0 Test Results: The temperature during TAS 203 testing was 69.3°F. Results are tabulated as follows:

6.3 Protocol TAS 203-94, Cyclic Wind Pressure Loading

Tables 14 through 16 provides the results for the positive and negative cyclic load test.

Design		Stage			
Pressure	+60.0 / -60.0 psf	1	2	3	4
Pressure Range (psf)		12.0 - 30.0	0.0 - 36.0	30.0 - 48.0	18.0 - 60.0
Average Cycle Time (sec.)		3.38	5.20	2.52	5.04
Number of Cycles		3500	300	600	100
		5	6	7	8
Pressure Range (psf)		18.0 - 60.0	30.0 - 48.0	0.0 - 36.0	12.0 - 30.0
Average Cycle Time (sec.)		5.24	2.52	4.68	2.36
Number of Cycles		50	1050	50	3350

Table 14: Test Specimen #1,2 and 3 TAS 203 Cvclic Test Spectrum and Average Cvcle Time

Table 15: Test Specimen #1,2 and 3 TAS 203, Positive Cyclic Load Test Results

Indicator	Maximum	mum Permanent Set Percent R		ecovery
Location	Deflection	(in.)	Measured %	Allowed %
1	0.05	0.08	NA	> 90
2	1.00	0.12	NA	> 90
3	0.04	0.05	NA	> 90
4	0.15	0.14	NA	> 90
5	0.06	0.08	NA	> 90
6	0.09	0.01	NA	

Table 16: Test Specimen #1,2 and 3 T	AS 203, Negative Cyclic Load Test results
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Indicator	Maximum Permanent Set		Percent R	ecovery
Location	Deflection	(in.)	Measured %	Allowed %
1	0.16	0.09	NA	> 90
2	0.95	0.20	NA	> 90
3	0.10	0.04	NA	> 90
4	0.15	0.20	NA	> 90
5	0.11	0.11	NA	> 90
6	0.05	0.03	NA	

Note: See Architectural Testing Sketch #2 for indicator locations. Deflection/permanent set reported is the overall deflection between three points (longest unsupported span) which accounts for support movement. Test Specimens #1, #2 and #3 were cycled in a common chamber.

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7.0 Test Equipment:

Cannon: Constructed from steel piping utilizing compressed air to propel the missile

Missile: 5/16" diameter ball bearings

Timing Device: Electronic beam type

Cycling Mechanism: Computer controlled centrifugal blower with electronic pressure measuring device

Deflection Measuring Device: Linear transducers

8.0 Laboratory Compliance Statements: The following are provided as required by the protocols for the testing reported herein.

Upon completion of testing, specimens tested for TAS 201-94 met the requirements of Section 1626 of the Florida Building Code, Building.

Upon completion of testing, specimens tested for TAS 203-94 met the requirements of Section 1626 of the Florida Building Code, Building.

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.



Architectural Testing will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. 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(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, Inc.

John C. McClane Laboratory Manager Shawn G. Collins, P.E. Manager - Regional Operations

JCM:jah

Attachments (pages): This report is complete only when all attachments listed are included. Appendix A: Sketches (2) Appendix B: Drawings (7)

This report produced from controlled document template ATI 00651, issued 01/18/13.





Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	Revision(s)
0	08/21/13	N/A	Original report issue
1	08/22/13	Appendix B	Revised assembly drawing



Appendix A

Sketches

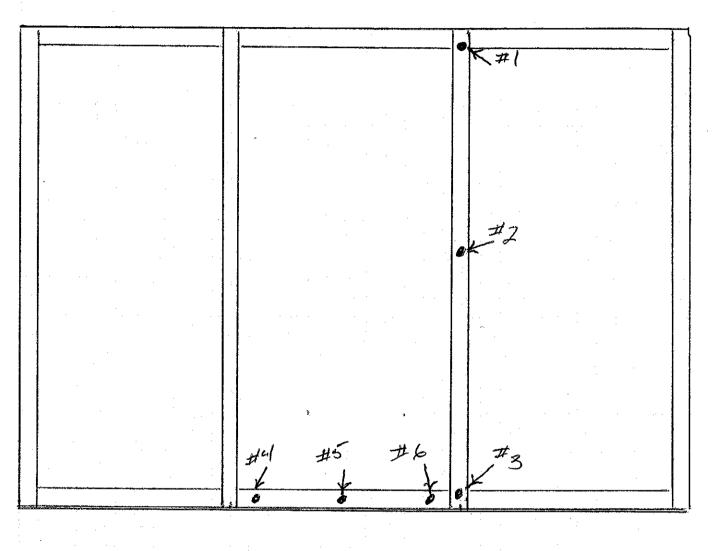
DATE: 8/13/13 Architectural Testing PROJECT NO. C3282.02 SHEET / OF 2 BY: Jem PROJECT NAME: CORALARCH, TECTURAL PROS. Impact Location Specimen 2 DH3 Specimen 3 Specimen 1 Đ#2 # O_3^{H} $\mathfrak{O}^{\#_2}$ #30 # \mathfrak{S}^{\sharp}



Architectural DATE: 8/13/13 Testing BY: JCm

PROJECT NO 23787.02 SHEET 2 OF 2 PROJECT NAME: CORALARCHITECTURAL PROD.

Indicator Locations





Appendix **B**

Drawings

TEST REPORT DRAWINGS FOR FL550T WINDOW WALL SYSTEM PROTOCOLS: TAS201/202/203 FOR USE IN HURRICANE ZONES REQUIRING LARGE & SMALL MISSILE IMPACT PROTECTION

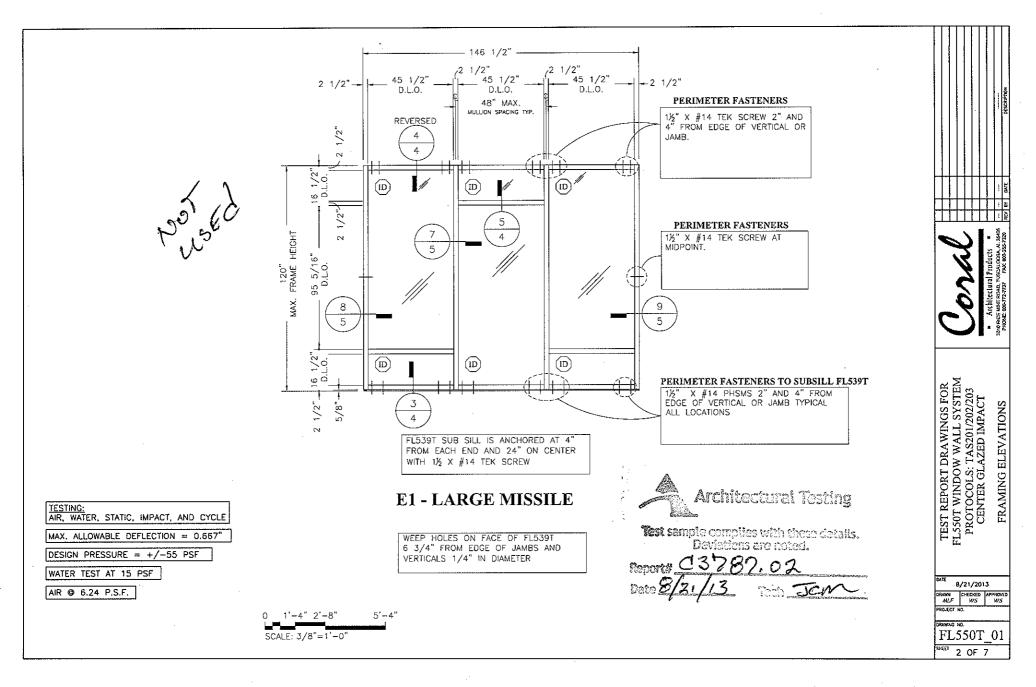
INDEX TO DRAWINGS 1 INDEX TO DRAWINGS AND NOTES PTRAMING ELEVATIONS - E1 LARCE MISSILE 3 FRAMING ELEVATIONS - E2 SMALL MISSILE 4 FRAMING DETAILS 5 FRAMING DETAILS 6 BILL OF MATERIALS AND GLAZING SCHEDULE 7 DIE DRAWINGS

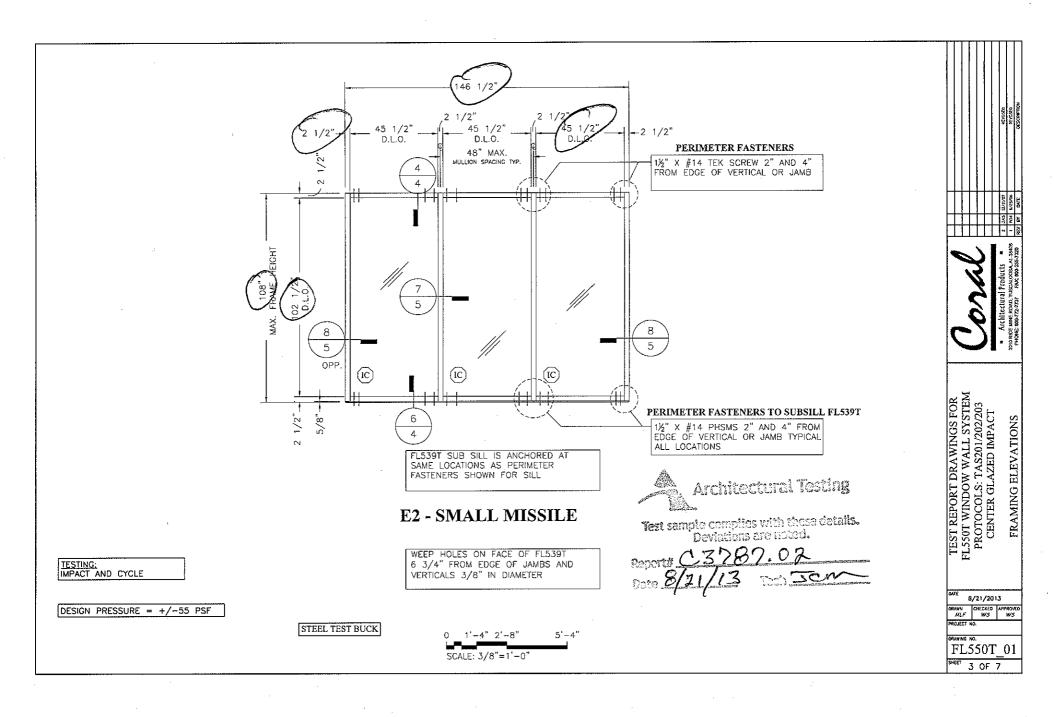
Architectural Testing Test sample complies with these details. Deviations are noted. port <u>C3787.02</u> the <u>8/21/13</u> Tech JCM
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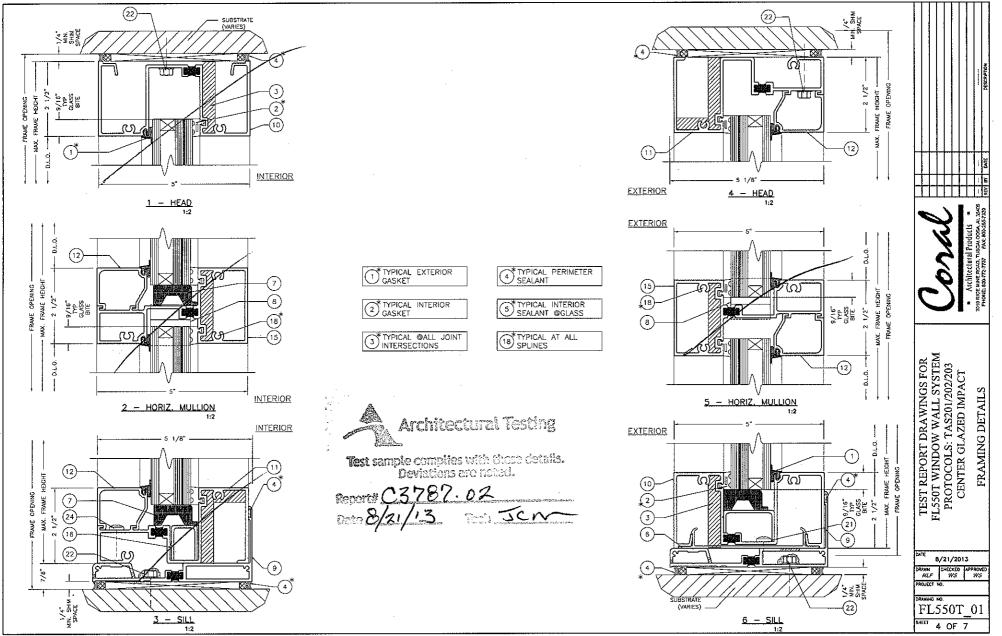
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1 OF 7

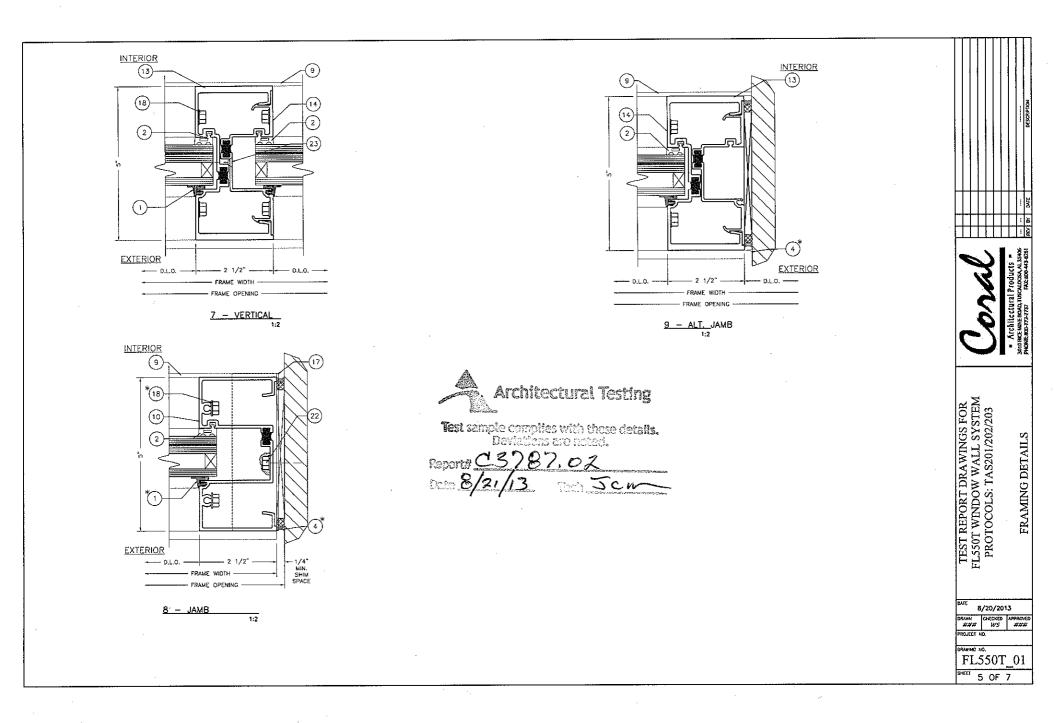
ABBREVIATIONS: D.L.O. = DAY LIGHT OPENING D.O.H. = DOOR OPENING HEIGHT D.O.W. = DOOR OPENING WIDTH C.O.C. = CONCEALED OVERHEAD CLOSER







.



1				1	<u>MATERIAL</u>	<u>OF N</u>					
		NOTES	IANUFACTURER	L	MATERIAL		DIMENSIONS	DESCRIPTION		P/N	TEM NO.
1111			VARIES		EPDM		0.120 SPACE	EXTERIOR GLAZING GASKET		NG1	1
			VARIES		EPDM		0.250 SPACE	INTERIOR SPACER GASKET		NG15	2
			HNEE-MOOREHEAD		BUTYL	/ARIES	0.500 X 0.125 X V		11	SM5601	3
		USED @ PERIMETER	DOW CORNING		SILICONE		FILL SPACE	SILICONE - PERIMETER SEALANT		795	4
		GLASS TO METAL AND INTERNAL	DOW CORNING		SILICONE		FILL SPACE	SILICONE - GLASS TO METAL		995	5
			AL INDUSTRIES, INC.	MINUM	6063-T6 ALUMINU		0.681 X 4.658 X (FLAT FILLER		FL515-1	6
		2 PER LITE	VARIES		EPDM		0.687 X 1.468 X 4	ING BLOCK @ SILL & HORIZONTAL		S815	7
		C EACH END OF HORIZONTAL	AL INDUSTRIES, INC.		INJECTION MOLDED PL		1.358 X-1.344 X 4	WATER-DIVERTER		WD3601	-8-
			AL INDUSTRIES, INC.		6063-T6 ALUMINU		2.620 X 5.402 X 0			FL539T	9
++++			AL INDUSTRIES, INC.		6063-T6 ALUMINL		2.500 X 5.000 X 0	HEAD OR WALL JAMB		FL571T	10
			AL INDUSTRIES, INC.		6063-T6 ALUMINU		2.500 X 4.980 X 0			FL572T	11
┼┼┼┽ᢤ	-		AL INDUSTRIES, INC.		6063-T6 ALUMINL		1.250 X 1.646 X C			FL553	12
┥┥┥			AL INDUSTRIES, INC.		6063-T6 ALUMINL		2.500 X 5.000 X 0	STD. VERTICAL MULLION		FL574T	13
			AL INDUSTRIES, INC.		6063-T6 ALUMINL		0.681 X 4.670 X 0			FL575T	14
		••	AL-INDUSTRIES, INC.		- 6053 TS ALUMINE		<u>2.500 X 4.980 X t</u>	INTERMEDIATE HORIZONTAL		-FL576T-	
\sim			AL INDUSTRIES, INC.		6063-T6 ALUMINL		1.156 X 0.844 X 0		-1	CS500-1	16
2			AL INDUSTRIES, INC.	MINUM	6063-T6 ALUMINU		2.500 X 1.000 X 0	SILL FLASHING END DAM	~1	ED519-1	17
X		TYP. SPLINE SCREW VERTICAL/HORIZONTAL JOINTS	VARIES		STEEL	ſS	#14 X 1" HHST	FASTENER	,	AS16	18
			-						ED	NOT USED	19
C		ANCHOR (ED519-1) TO ()(FL539T)	VARIES		STEEL	Н	#6 X 1/4" PPI	FASTENER	1	AS21	20
â		ANCHOR FL571T TO () FL539T INSIDE SET ONLY	VARIES	-	S. STEEL	SMS	#12 X 1/2" PHPS	FASTENER		A\$57	21
-71	6	ANCHOR MISC PARTS TO SUBSTRATES	VARIES	ED	ZINC PLATED	SCREW	#14 X 2" HH TEK S	FASTENER)R	ANCHOR	22
		ANCHOR (1) FL575T TO (13) FL574T COUNTER SINK AND BREAK OFF	VARIES	-	S. STEEL	c	#8 X 2" FHPU	FASTENER	,	AS29	23
		ANCHOR 11 FL572T TO (1) FL539T	VARIES	ED	ZINC PLATED	PSMS	#14 X 1 1/2" PHF	FASTENER	,	A\$59	24
FL550T WINDOW WALL SYSTEM PROTOCOLS: TAS201/202/203 CENTER GLAZED IMPACT	OR				DULE	CHE	LAZING SO	G			
FL550T WINDOW WALL SYSTEM PROTOCOLS: TAS201/202/203 CENTER GLAZED IMPACT	NGS F		MAXIMUM DESIGN PRESSURE (PSF)	SIZE SQU. FE	MAXIMUM D.L.O. SIZE (INCHES)	GLASS MARK	MANUFACTURER	GLASS DESCRIPTION			
VAL S201 ED II	AWI	/	+/-55	6" 30.	45-1/2" X 96"	ID	DUPONI	5/16" INSULATED25T X 1/2" AB AS X T X .090 SENTRY GLAS X .25T			
5 E 2	2		+/-55	3/8" 32.	45-1/2" X 102-3/8	IC I	DUPONT	5/16" INSULATED25T X 1/2" AB AS X T X .035 SENTRY GLAS [®] X .25T			

GLAZING SCHEDULE							
GLASS DESCRIPTION	MANUFACTURER	GLASS MARK	MAXIMUM D.L.O. SIZE (INCHES)	SQUARE FEET	MAXIMUM DESIGN PRESSURE (PSF)		
1-5/16" INSULATED25T X 1/2" AB AS X .25T X .090 SENTRY GLAS® X .25T	DUPONT	ID	45-1/2" X 96"	30.33	+/-55		
1-5/16" INSULATED25T X 1/2" AB AS X .25T X .035 SENTRY GLAS [®] X .25T	DUPONT	ıc	45-1/2" X 102-3/8"	32.35	+/-55		

Architectural Techng Coloradores El calificiones

Test sample complies with these details. Deviations are taked 23787.028/21/13 Scm

B/21/2013 CHECKED APPROVE F WS WS

FL550T_01 SHEET 6 OF 7

DATE DRAWN CH MLF PROJECT NO.

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