



CONSTRUCTION MATERIALS

TECHNOLOGIES

LABORATORY TEST REPORT

Report for: Coral Architectural Products
7704B Industrial Lane
Tampa, FL 33637

Attention: Mr. William Smith

Product Type: Aluminum Fixed Window	Product Series/Model: FL550T Series
Project No.: CORL-001-02-01	Source: Coral Architectural Products

Series: "FL550T" 1289mm x 2203mm (50.75"x86.75") Fixed Aluminum Window with IGU	
Test Method Description	Summary of Result
ASTM E 1996-09 (Large Missile Impact):	Pass No Penetration
ASTM E 1886-05 (Positive Test Pressure):	Pass +2640 Pa (+55.14 psf)
ASTM E 1886-05 (Negative Test Pressure):	Pass -2640 Pa (-55.14 psf)

Test Methods/Specifications:

- ASTM E 1996-09 Standard Specification for Performance of Exterior, Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes
- ASTM E 1886-05 Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials

Testing Dates: 05/12/2016	Report Date: 08/03/2016
Test Record Retention Date: 08/03/2021	

- Reference must be made to Project No., CORL-001-02-01, dated 08/03/2016 for complete test specimen description and detailed results.

CORL-001-02-01 PRI-CMT Accreditations: IAS TL-189; Miami-Dade 11-0429.05; Florida TST5878; Los Angeles TA24819; CRRC; AAMA; Keystone
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I. Product Manufacturer & Location: Coral Architectural Products
7704B Industrial Lane
Tampa, FL 33637

II. Accredited Testing Laboratory: PRI-Construction Materials Technologies, LLC
6412 Badger Drive
Tampa, FL 33610

II.1. Testing Location: Testing was conducted at PRI-CMT located in Tampa, FL. Calibration of testing instrumentation was performed by a PRI-CMT representative in compliance with PRI-CMT In-House quality control program governed by ISO/IEC 17025-05

III. Product Type: Aluminum Anodized Thermally Broken Storefront System

IV. Product Series/Model: FL550T Series

V. Test Specimen Details:

V.1. Sizes:

V.1.1. Overall Unit Size (X3): 1289mm x 2203mm (50.75" x 86.75") 2.84m² (30.57ft²)

V.2. Framing Members:

V.2.1. Head/Sill/Jamb: Extruded aluminum straight cut, fabricated, and mechanically secured at each corner with two (1/4"-20 x 1") hex head steel fasteners. Adhesive butyl tape was applied to all interior corners.

V.2.2. Weatherstripping: Exterior: Top load push in EPDM square cut. Dow 995 silicone is applied at the corners 2" up the vertical leg and 2" across the horizontal leg. Interior: Slide in EPDM gasket with Dow 995 filling the cavity from glass to aluminum.

V.3. Glazing:

V.3.1. Daylight Opening Sizes:

Size		Total Area		Quantity
SI (mm)	Imperial (inches)	SI (m ²)	Imperial (ft ²)	
1159 x 2070	45.63" x 81.50"	2.40	25.8	1 per assembly

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V.3.2. IGU Configuration:

IGU Thickness	Spacer Type	Interior Pane	Exterior Pane	Glazing Method	Glazing Bite Depth
Dual Glaze 33.3mm (1-5/16")	Aluminum box. Single Sealed	6.4mm (1/4") annealed 2.7mm (0.105") Kurray pvb 6.4mm (1/4") annealed	6.4mm (1/4") annealed	The glass lite was set from the exterior onto two 3/4" tall by 1-1/2" wide and 4" long setting blocks. The setting blocks were supported by aluminum extruded "U" channels. The glass lite was positioned between EPDM glazing gaskets on the framing members. Dow 995 sealant was applied to the interior perimeter of the gasket/glass lite.	16mm (5/8")

V.4. Weeping System: "No Drainage"

V.5. Reinforcements: "No Reinforcement"

V.6. Screen: "No Screen"

V.7. Hardware: "No Hardware"

V.8. Installation

The test specimen was installed into a nominal 51mm x 254mm (2"x10") Southern Yellow Pine wooden test buck. The rough opening maintained a clearance of 3.2mm (0.13") around the perimeter of the test specimen. Sealant complying with AAMA 800 was utilized to seal the interior/exterior perimeters to the test buck.

Frame Member	Dimensional Location on Member	Anchor Description	Quantity
Head	121mm (4.75") and 184mm (7.25") from each end.	#14 x 3-1/2" steel fastener	4 Total
Sill	121mm (4.75") and 184mm (7.25") from each end.	#14 x 3-1/2" steel fastener @ 121mm (4.75") and #14 x 2-3/4" @ (7.25")	4 Total

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VI. Official List of Witnesses:

Tim Efaw
 Daniel Arents
 William Smith

Company

PRI-CMT
 PRI-CMT
 Coral Architectural Products

VII. Test Results: Testing was performed at an ambient condition of 23°C (74°F) with 45% Rh.

**Test Results – ASTM E1996 Large Missile Impact “Specimen 1”
 (FL550T Series Aluminum Fixed Window with IGU)**

Impact ¹	Missile Weight	Missile Length	Missile Velocity	Location of Impact ²	Observation	Result ³
1	4173 g (9.2 lbs)	2.3 m (92.00")	14.93 m/s (49.0 fps)	Center of Infill	Shatter exterior annealed lite. Fractured interior laminate lite. No penetration.	Pass

Notes:

1. The end of the cannon barrel was located 5.2 m (17') from the exterior surface of the test specimen.
2. Missile impact was within 5° of horizontal
3. Upon completion of testing the specimen met the requirements outlined in the Florida Building Code section 1626.

**Test Results – ASTM E1996 Large Missile Impact “Specimen 2”
 (FL550T Series Aluminum Fixed Window with IGU)**

Impact ¹	Missile Weight	Missile Length	Missile Velocity	Location of Impact ²	Observation	Result ³
1	4173 g (9.2 lbs)	2.3 m (92.00")	15.20 m/s (49.9 fps)	Lower Left Corner of Infill	Shatter exterior annealed lite. Fractured interior laminate lite. No penetration.	Pass

Notes:

1. The end of the cannon barrel was located 5.2 m (17') from the exterior surface of the test specimen.
2. Missile impact was within 5° of horizontal
3. Upon completion of testing the specimen met the requirements outlined in the Florida Building Code section 1626.

**Test Results – ASTM E1996 Large Missile Impact “Specimen 3”
 (FL550T Series Aluminum Fixed Window with IGU)**

Impact ¹	Missile Weight	Missile Length	Missile Velocity	Location of Impact ²	Observation	Result ³
1	4173 g (9.2 lbs)	2.3 m (92.00")	15.02 m/s (49.3 fps)	Upper Right Corner of Infill	Shatter exterior annealed lite. Fractured interior laminate lite. No penetration.	Pass

Notes:

1. The end of the cannon barrel was located 5.2 m (17') from the exterior surface of the test specimen.
2. Missile impact was within 5° of horizontal
3. Upon completion of testing the specimen met the requirements outlined in the Florida Building Code section 1626.

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**Test Results – ASTM E1886 Cyclic Pressure Differential
 (FL550T Series Aluminum Fixed Window with IGU Specimens 1-3)**

Pressure Differential ¹		Direction	Number of Cycles Completed	Seconds per Cycle	Max Deflection ²	Permanent Deformation ²	Result ^{3,4}
Pa	(PSF)						
528 to 1320	11.03 to 27.57	Positive	3500	3.00	1.5mm (0.06")	0.5mm (0.02")	Pass
0 to 1584	0 to 33.08		300	3.00	2.0mm (0.08")	0.5mm (0.02")	Pass
1320 to 2112	27.57 to 44.11		600	3.00	2.1mm (0.08")	0.6mm (0.03")	Pass
792 to 2640	16.54 to 55.14		100	3.00	2.4mm (0.10")	0.7mm (0.03")	Pass
-792 to -2640	-16.54 to -55.14	Negative	50	3.00	4.6mm (0.18")	0.7mm (0.03")	Pass
-1320 to -2112	-27.57 to -44.11		1050	3.00	2.4mm (0.10")	0.8mm (0.03")	Pass
0 to -1584	0 to -33.08		50	3.00	2.0mm (0.08")	0.8mm (0.03")	Pass
-528 to -1320	-11.03 to -27.57		3350	3.00	1.9mm (0.08")	0.6mm (0.02")	Pass

Notes:

1. Tape and polyethylene film were utilized to seal the specimen for excessive air leakage, and in the PRI-CMT witness's opinion did not influence the test results.
2. Data captured on the sill between anchors.
3. All three specimens were cycled in a common chamber max deflection and permanent deformation, was the most excessive recorded by technician.
4. Upon completion of testing the tested specimens met the passing requirements outlined in ASTM E 1996-09 section 7.

VIII. Equipment Utilized:

- VIII.1. Computer controlled reversible blower with pressure transducers
- VIII.2. Laser distance transducers
- VIII.3. Large Missile Impact Cannon

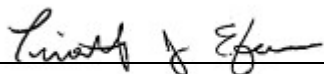
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Statement of Compliance:

Testing was conducted in accordance with methods designated in ASTM E 1996-09 *Standard Specification for Performance of Exterior, Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes*, and ASTM E 1886-05 *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*. Upon completion of testing the test specimens successfully rejected 1 missile impact to the infill, and resisted cyclic loading as stated in Table 1626 of the 2014 edition of The Florida Building Code, at a +/-2640 Pa (+/-55.14psf). The laboratory test results presented in this report are representative of the specimen supplied. This report does not constitute certification of this product which may only be granted by the certification program administrator.

Detailed drawings showing wall thickness of all members, corner construction and hardware application are on file and have been compared to the sample submitted. A test sample will be retained at the test laboratory for a period of 2 years; electronic documentation will be retained for 5 years. Manufacturer's drawings and bill of materials are contained in Appendix A.

Signed: _____



Timothy Efaw
Manager

Signed: _____



Jason Simmons
Director

Date: _____

August 3rd, 2016

Date: _____

August 3rd, 2016

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	08/03/2016	13	NA

Appendix Attached

CORL-001-02-01 PRI-CMT Accreditations: IAS TL-189; Miami-Dade 11-0429.05; Florida TST5878; Los Angeles TA24819; CRRC; AAMA; Keystone
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Appendix A

Manufactures Drawings/BOM/Pictures (6 pages)

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TEST REPORT DRAWINGS FOR FL550T WINDOW WALL SYSTEM WIND ZONE III ASTM E1886-E1996

FOR USE IN HURRICANE ZONES REQUIRING LARGE & SMALL MISSILE IMPACT PROTECTION

INDEX TO DRAWINGS

- 1 INDEX TO DRAWINGS AND NOTES
- 2 FRAMING ELEVATIONS - E1 LARGE MISSILE
- 3 FRAMING DETAILS
- 4 BILL OF MATERIALS AND GLAZING SCHEDULE
- 5 DE DRAWINGS

ABREVIATIONS:
 D.O.C. = DOOR OPENING HEIGHT
 D.O.W. = DOOR OPENING WIDTH
 C.O.C. = CONCEALED OVERHEAD CLOSER

PRI Construction Materials Technologies

Specimen sample complies with these details.
 Discrepancies are noted. *HP*
 Date: 08/02/16 Technician: *HP*
 Report No. CORL-001-02-01

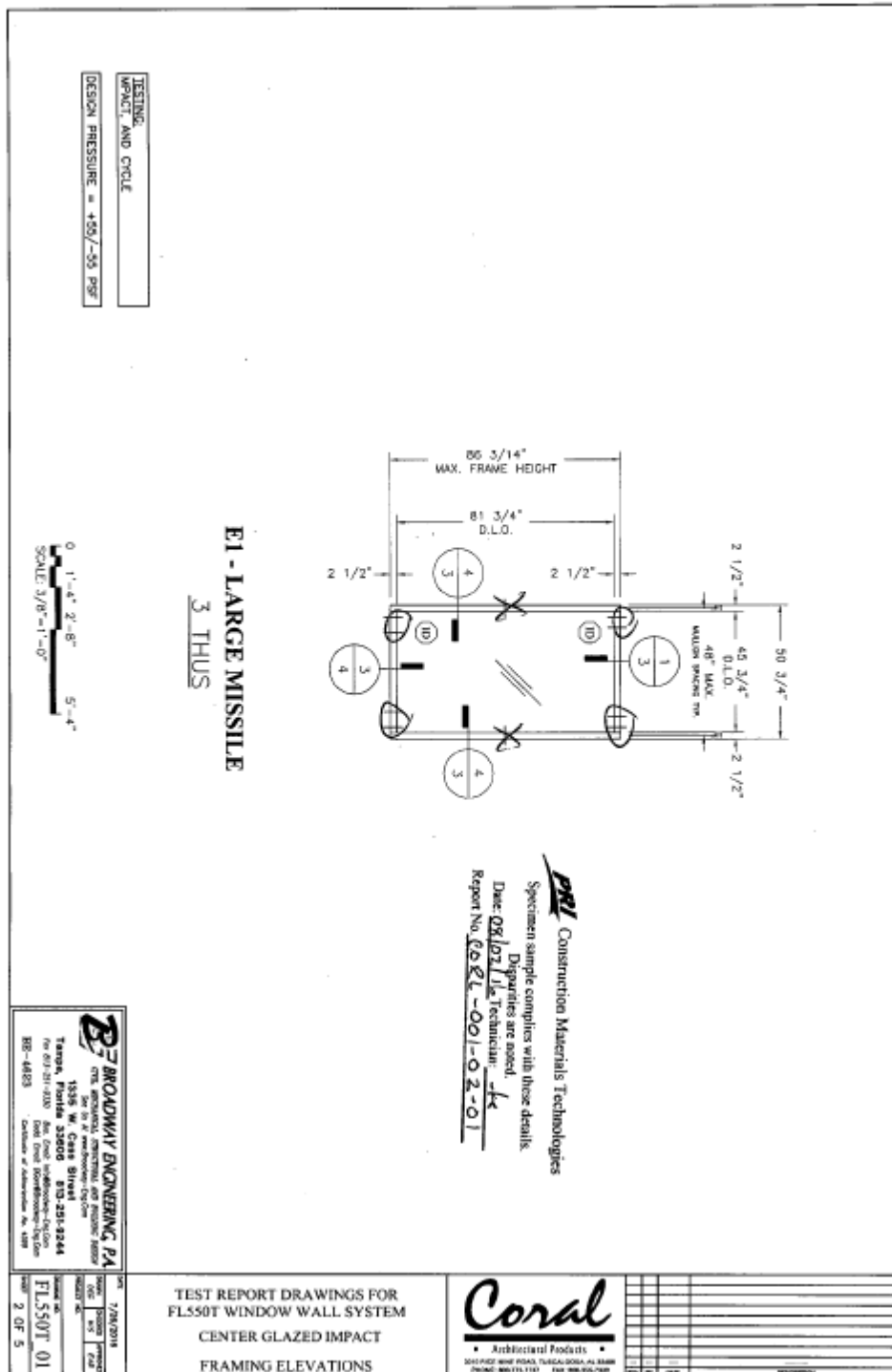
BROADWAY ENGINEERING, P.A.
 1525 W. Cass Street
 Tampa, Florida 33606 813-251-9244
 Fax 813-251-9287
 HR-4623 Certificate of Authorization No. 4999

TEST REPORT DRAWINGS FOR
 FL550T WINDOW WALL SYSTEM

INDEX TO DRAWINGS AND NOTES

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 Architectural Products
 140-1000 WINE ROAD, TUSCALOOSA, AL 35468
 PHONE: 800-773-1137 FAX: 205-233-1137


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BILL OF MATERIALS						
ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
1	NO1	EXTERIOR GLAZING GASKET	0.120 SPACE	EPDM	WAHES	
2	NO14	INTERIOR SPACER GASKET	0.250 SPACE	EPDM	WAHES	
3	SH4601	JOINT SEALANT TAPE	0.500 X 0.125 X WAHES	BUTYL	SCHWIE-MORRHEAD	
4	755	SILICONE - PERIMETER SEALANT	FILL SPACE	SILICONE	EDM CORNING	USED @ PERIMETER
5	955	SILICONE - GLASS TO METAL	FILL SPACE	SILICONE	EDM CORNING	GLASS TO METAL AND INTERNAL
6	FL512-1	FLAT TILLER	0.681 X 4.630 X 0.070	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	2 PER LITE
7	5915	SETTING BLOCK @ SILL & HORIZONTAL	0.687 X 1.468 X 1.000	EPDM	CORAL INDUSTRIES, INC.	@ EACH END OF HORIZONTAL
8	W03500-1	WATER DRAINER	1.358 X 1.344 X 4.000	INJECTION MOLDED PLASTIC	CORAL INDUSTRIES, INC.	
9	FL539T	SUBSILL FLASHING	2.620 X 5.402 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
10	FL571T	HEAD OR WALL JAMB	2.500 X 5.000 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
11	FL572T	SILL OR HEAD	2.500 X 4.980 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
12	FL553	GLASS STOP	1.250 X 1.646 X 0.078	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
13	FL574T	STO. VERTICAL MULLION	2.500 X 5.000 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
14	FL576T	OPEN BACK MULLION FILLER	0.681 X 4.670 X 0.090	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
15	FL578T	INTERMEDIATE HORIZONTAL	2.500 X 4.980 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
16	CS500-1	SETTING CHAIR	1.156 X 0.844 X 0.078	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
17	ED519-1	SILL FLASHING END DOW	2.500 X 1.000 X 0.062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
18	AS16	FASTENER	#14 X 1" HH55	STEEL	WAHES	
19	NOT USED					
20	AS21	FASTENER	#6 X 1/4" PP9H	STEEL	WAHES	
21	AS57	FASTENER	#12 X 1/2" PP9HMS	S. STEEL	WAHES	
22	ANCHOR	FASTENER	#14 X 2" HI TEX SCREW	ZINC PLATED	WAHES	ANCHOR @ FL571T TO @ FL59T INSIDE SET ONLY
23	AS29	FASTENER	#8 X 2" PP9HC	S. STEEL	WAHES	ANCHOR @ FL571T TO @ FL574T COUNTER SINK AND BRIDG. GRT.
24	AS29	FASTENER	#14 X 1 1/2" PP9HMS	ZINC PLATED	WAHES	ANCHOR @ FL572T TO @ FL59T


GLAZING SCHEDULE					
GLASS DESCRIPTION	MANUFACTURER	GLASS MARK	MAXIMUM GLASS SIZE (INCHES)	SQUARE FEET	MAXIMUM DESIGN PRESSURE (PSF)
1-5/16" INSULATED - 23HS X 1/2" AIR AS					
1-5/16" X 25HS X 0.06 PPB 25HS	SOUTHLIN	3D	46" X 83"	26.0	+55/-55

 Construction Materials Technologies
 Specimen sample complies with these details.
 Disputes are noted.
 Date: 08/16/16 Technician: -H
 Report No.: CORL-001-02-01

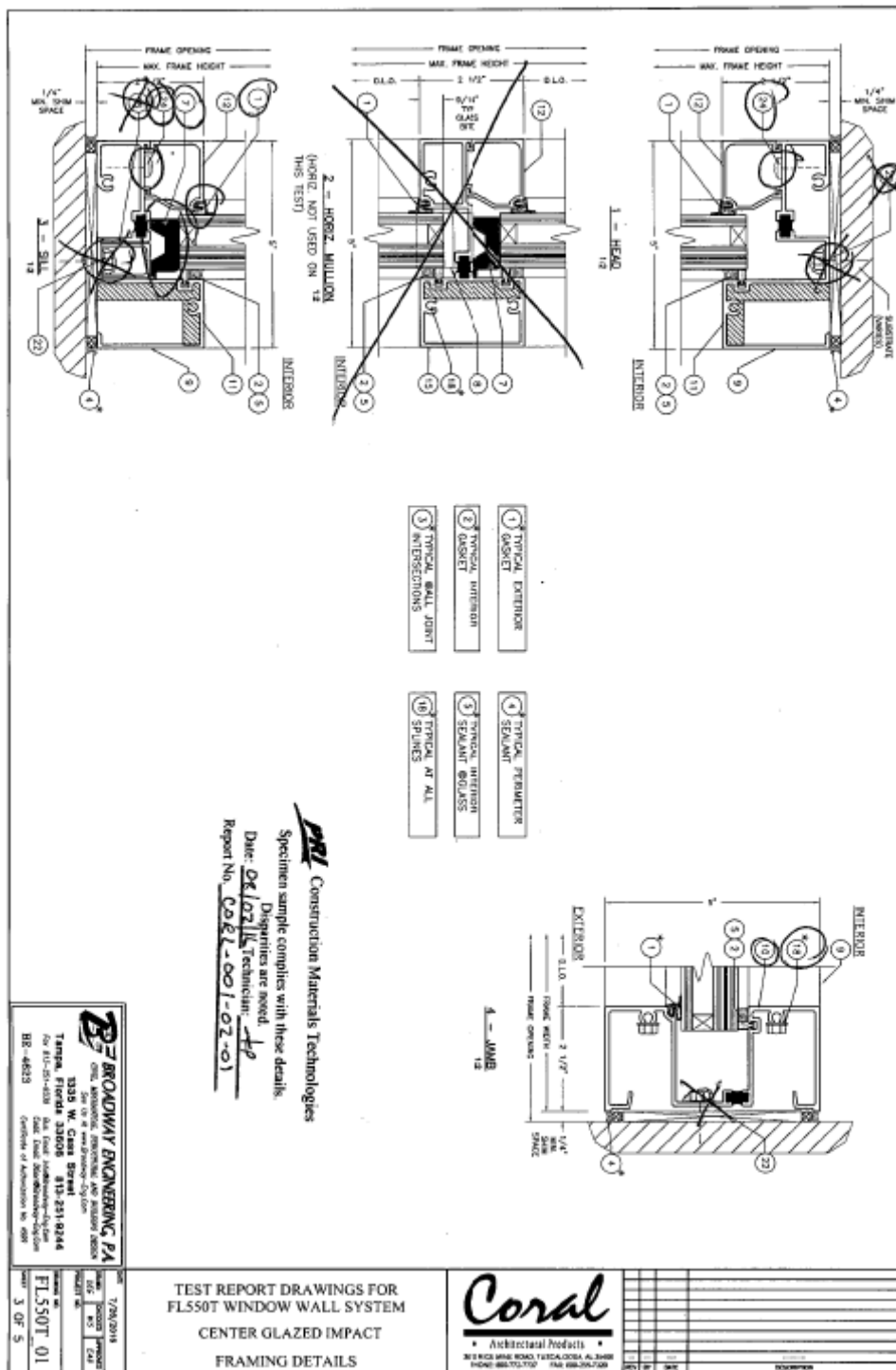


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 Fax: 813-261-4320 E-mail: sales@broadway-engineering.com
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TEST REPORT DRAWINGS FOR
 FL550T WINDOW WALL SYSTEM
 CENTER GLAZED IMPACT
 BILL OF MATERIALS AND GLAZING
 SCHEDULE


 Architectural Products
 10000 W. BAYVIEW BLVD. SUITE 1000
 TAMPA, FL 33611-4000

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Coral
• Architectural Products •
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TEST SPECIMEN PHOTO



END OF REPORT

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