HURRICANE TEST LABORATORY, LLC

Testing & Evaluation Solutions

CORAL ARCHITECTURAL PRODUCTS

"Series 281 Doors"

HTL Report # G402-0304-07

May 2, 2007

J.D. Williams
CORAL ARCHITECTURAL PRODUCTS
3010 Rice Mine Road
Tuscaloosa, Alabama 35406

Re: HTL Test Report #G402-0304-07

Dear Mr. Williams;

Enclosed you will find the test report package for the Series 281 Door system tests that were performed at Hurricane Test Laboratory, LLC in Lithia Springs, Georgia..

This test report package includes the following items:

- Cover Letter
- Laboratory Compliance Letter
- HTL Test Report # G402-0304-07 for Specimen # 1 - 3
- Drawings

If you have any questions, please contact our office.

Sincerely,

HURRICANE TEST LABORATORY, LLC

Vinu J. Abraham, P.E.
FL Reg. # 53820

HURRICANE TEST LABORATORY, LLC

FLORIDA OFFICE

6655 Garden Road

Riviera Beach, FL 33404

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1701 Westfork Drive, Suite 106

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LABORATORY COMPLIANCE LETTER

May 2, 2007

Jaime D. Gascon
Miami-Dade Building Code Compliance Office
Metro-Dade Flagler Building, Suite 1603
140 West Flagler Street
Miami, Florida 33130-1563

Re: Laboratory Compliance Letter (HTLGA07007)

Dear Mr. Gascon:

The tests described in the reports for the below jobs and specimen numbers have been performed in full accordance of the requirements of the Florida Building Code, with no deviations.

Job #	Test Unit #	TAS 201	TAS 203	TAS 202			
				AIR	WATER	STATIC	FORCED ENTRY
G402-0304-07	E21	X	X			X	
	E22	X	X	X		X	X
	E23	X	X	X		X	X

If you have any questions, please contact our office.

Sincerely,

HURRICANE TEST LABORATORY, LLC

José E. Colón, E.I.
Operations Manager

HURRICANE TEST LABORATORY, LLC

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6655 Garden Road
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TEST REPORTS

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MANUFACTURER'S IDENTIFICATION

1.0 NAME OF APPLICANT: CORAL ARCHITECTURAL PRODUCTS
3010 Rice Mine Road
Tuscaloosa, Alabama 35406
(800) 772-7737

2.0 CONTACT PERSON: J.D. Williams

3.0 HTL Test Notification: HTLGA07007

4.0 HTL Lab Certification: Miami-Dade County #04-0806.02
Florida Building Code #TST3892
IAS #TL-388

PRODUCT IDENTIFICATION (Elevations E21 and E22)

4.0 Product Types: Narrow Stile Door with 3-point-lock.

5.0 Model Number: Coral Series 281 Narrow Stile Door with 3- point lock installed into FL500 Framing.

6.0 Performance Class: +/- 65

7.0 Overall Size: 77" (w) x 86-1/2" (h)

8.0 Door Panel Sizes: Two operable door panels, each panel is 36" (w) x 84" (h)

9.0 Configuration: Operable pair of doors

10.0 Drawing: This test report is incomplete without the attached test unit drawing "281_01" (sheets 1 – 12) bearing the raised seal of Hurricane Test Laboratory, LLC.

11.0 Sample Source: Samples provided by Coral Architectural Products

PRODUCT DESCRIPTION

12.0 MATERIAL CHARACTERISTICS:

12.1 Frame Construction: All of the main members of the frame were fabricated using the aluminum extrusions with the following cross-sectional properties:

Description	Part #	Overall Cross Section	Material
Head	FL507	2.500" x 5.000" x 0.080"	6063-T6
Jambs	FL504	2.500" x 5.000" x 0.094"	6063-T6
Jamb Anchor Plate	FL515	0.681" x 4.670" x 0.080"	6063-T6
Threshold	TH4	0.500" x 4.000" x 0.125"	6063-T6
Panic Stop	DP200-1	1.323" x 0.402" x 0.188"	6063-T6
Door Stop	DS500-1	0.648" x 1.260" x 0.094"	6063-T6

Note: See HTL Test Report Drawing 281-01 Sheet 2 (for unit E21) and Sheet 3 (for unit E22) for an overall view of these samples.

The following construction procedures (typical) were utilized in the assembly of the frame: Typical Frame Corner Construction: At each top corner, the frame jamb ran through while the frame head member was square cut, butted, and mechanically fastened to the frame jamb using four (4) #14 x 1" HH STS. At each bottom corner, the frame jamb member ran through while the threshold was square cut, butted and mechanically fastened to the frame jamb using 1.390" x 1.909" x 1/8" zinc plated steel clips (Coral Part # TH403) and four (4) each # 12-24 x 3/8" FHMS. Reference Drawing 281_01 Sheet 7 for exploded view of this assembly.

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FL Reg. # 53820

Door Stop Attachment: Each continuous head stop (Part DS500-1) was mechanically attached with three (3) each#10 x 1-3/4" FHPUC TEK fasteners located at midpoint and 10" from each end and each jamb stop was attached with three (3) #10 x 1-1/4" FHPUC TEK fasteners located at midpoint and 10" from each end. The panic stop (Part # DP200-1) was mechanically applied to the threshold using two (2) #10-16 x ½" FHP TEK screws. Reference Drawing 281_1, Sheet 7 for exploded view of this assembly.
Frame Filler: Each continuous flat filler plate (Part # FL515) was snap applied to each jamb.
Frame Corner Sealant: At each frame head corner the joint was sealed using strips of SM5601 Schnee-Moorehead TackyTape ® Industrial Tape Sealant. At the bottom corner, the threshold was sealed to the vertical members using Dow 795 silicone sealant.

12.2 Door Construction: Each of the door leaves were fabricated using some are all of the following aluminum extrusions:

Description	Part #	Overall Cross Section	Alloy
Door Hinge Stiles	D103	2.125" 1.750" x 0.120"	6063-T6
Door Active Meeting Stile	D105	1.989" x 1.750" x 0.120"	6063-T6
Door Inactive Meeting Stile	D104	2.125" x 1.750"x 0.120"	6063-T6
Door Bottom Rail (E22)	D108	7.500" x 1.710" x 0.120"	6063-T6
Door Bottom Rail (E21)	D109	9.500" x 1.710" x 0.120"	6063-T6
Door Top Rail	D101	2.250" x 1.710" x 0.120"	6063-T6
Adjustable Astragal	D106	0.331" x 1.562" x 0.062"	6063-T6
Door Bottom Rail Sweep	WS100	0.812" x 0.302" x 0.125"	6063-T6
Glass Stops (applied)	DG501	1.000" x 0.539" x 0.065"	6063-T6
Glass Stops (snap-in)	DG502	0.500" x 0.625" x 0.055"	6063-T6

The following construction procedures (typical) were utilized when assembling each door leaf:
Door Panel Corner Construction: At each door corner, both rail ends were square cut, butted, and attached together using door corner block (Part# CB101 for the top rail and Part # CB109 for E21 and CB108 for E22 bottom rail). At each top door panel corner, the horizontal rail was mechanically fastened to the stile with the corner blocks using one (1), 3/8-16 x ¾" HWH zinc plated cap bolt threaded into a 1.475" x 1.475" x 0.180 zinc plated square nut (Part # AS13) positioned inside the stile. At each bottom door panel corner, the horizontal rail was mechanically fastened to the stile with the corner blocks using two (2), 3/8-16 x ¾" HWH Zinc plated cap bolts threaded into two (2) 1.475" x 1.475" x 0.180 Zinc plated square nuts (Part # AS13) positioned inside the stile. Additionally, four (4) #10 x ¾" PFH Type "B" Zinc plated fasteners were used to attach each end of the top and bottom rails to the corner block. The door panel corners were not welded. Reference Drawing 281_01 Sheet 5 of 12 for exploded view details of the typical Top and Bottom rail corner construction.
Door Leaf Corner Sealant: None used.
Miscellaneous Construction: A continuous aluminum sweep (Part # WS136) is applied along the bottom edge o each door leaf. Each sweep is secured to the bottom door rail of the door leaf using three (3) #8 x ¾" POH TEK fasteners. A continuous adjustable astragal (Part # D106) is applied to the active door leaf meeting stile using a single row of #8 x ¾" POH TEK fasteners located at approximately 4" and 18" from the bottom edge and 4", 18" and 32"from the top edge. One cone steel spring (Part # SP100) was included at each fastener location
Glazing Stop Construction: The lites of glass used in this sample were glazed to the door stiles and rails using DG501 glass stop on the interior side and DG502 snap-in on the exterior. DG501 is secured to the interior door stiles with 3 each CS501-1 clips located at midpoint and 10" from each end. Each CS501-1 is attached to the stiles with one (1) each #8 x ¾" POH TEK fastener. DG501 is attached to the top and bottom rails using 2 each CS501-1 clips

located 10" from each end. Each CS501-1 clip is attached with one (1) (8 x ¾" POH TEK fastener. Please reference sheet 12 of the attached drawings for more information.

12.3 Glazing:

12.3.1 Glazing Materials:

Glass Type "U": 0.620" laminated glass with the following components:

- ¼" heat strengthened glass
- 0.120" Uvekoi "S" Interlayer
- ¼"" heat strengthened glass

Glass Type B: 0.590" laminated glass with the following components:

- ¼" heat strengthened glass
- 0.090" Solutia SAFLEX PVB Interlayer
- ¼" heat strengthened glass

12.3.2 Glazing Method: Each lite of glass used in each door leaf was glazed using the following (typical) procedures:
DG502 Glass Stop: Using a single row of 0.188 EPDM glazing gasket (Part # NG1).
DG501 Glass Stop: Using a single row of 0.094 EPDM spacer gasket (Part # NG13) followed by a ¼" x ½" continuous bead of Dow Corning 995 structural silicone sealant.

12.3.2 Daylight Opening:

E22:

Location	Qty.	Daylight Opening	Glass Bite	Glass Type
Inactive Door Panel	1	29-9/16" x 69-7/16"	¾"	U
Active Door Panel	1	29-9/16" x 69-7/16"	¾"	B

E23:

Location	Qty.	Daylight Opening	Glass Bite	Glass Type
Inactive Door Panel	1	29-9/16" x 71-7/16"	¾"	U
Active Door Panel	1	29-9/16" x 71-7/16"	¾"	B

12.4 Weather-stripping:

Qty.	Location	Description
20-lf.	Frame head and jambs	EPDM (Part # NG5)
14-lf.	Two rows along adjustable astragal.	Schlegel wool pile (Part # WP106)
6-lf.	Along back of bottom of door panels	Coral vinyl weathering strip (Part # VG1)

12.5 Hardware:

Qty.	Location	Description
6	Three (3) per door panel, located on door panel hinge stile, 6" from the top edge and 9" and 45-11/32" from the bottom edge.	Butt Hinge (Part #DH109). Each hinge was attached to the frame jamb using four (4) #12-24 x ½", and to the door stile using four (4) #12-24 x ½".
2	Exterior of doors	Coral pull handle (Part # PH1-10)
2	Interior of doors	Coral push bars (Part # PB1-36
1	Active door	Cylinder (Part # DH078)
1	Active door	3-point lock (Part # DH067)
1	Inactive door	Steel tip flush bolt (Part # DH176) (Located 10" from top and bottom of stile)
2	Bottom of doors	Coral door bottom sweep (Part # WS136)

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12.6 Sealant's Used:

Location	Sealant
Perimeter Sealant	Dow Corning 795 Silicone Sealant
Frame Joint Sealant	Schnee-Moorehead SM5601TackyTape Industrial Tape Sealant

INSTALLATION

13.0 Following is a description of how this sample was installed in the steel test buck when viewed from the exterior:

Location	Fastener	Fastener Schedule
Frame Head	Attached to the opening using two (2), 3/8" x 1-1/2" HWH STC" bolts	One each 2-1/2" on each side of the geometric centerline.
Frame Jambs	Attached to the opening using four (3/8" x 3-1/2" GRD 2 with nuts and washers	5" from the top end and 2-3/8", 45", and 51" from the bottom end.
Threshold	Attached to the steel substrate using four (4), #12 x 1-1/2" #3 TEK screws	One 2" and 4" on each side of the geometric centerline.

NOTE: There was a ¼" shim space used around the perimeter of each test sample at the head, sill and jamb locations.

TEST RESULTS

14.0 SUMMARY OF RESULTS:

Test Method	Test Conditions	Test Conclusion
Specimen # 1 (E-21)		
Uniform Static Load Test (ASTM E330 & TAS 202)	+/- 65 psf Design Pressure	PASS
Large Missile Impact Test (TAS 201 and ASTM E1886/E1996)	9-lb, 2 x 4 @ 50ft/sec	PASS
Cyclic Load Test (TAS 203 and ASTM E1996)	+/- 65 psf Design Pressure	PASS
Specimen # 2 (E-22)		
Air Infiltration Test (ASTM E283 & TAS 202)	1.57 psf & 6.24 psf	PASS
Uniform Static Load Test (ASTM E330 & TAS 202)	+/- 65 psf Design Pressure	PASS
Forced Entry Resistance Test (TAS 202)	300-lb.	PASS

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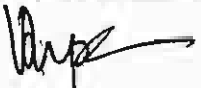

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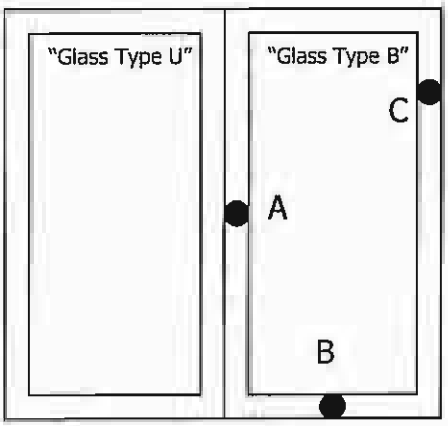
Large Missile Impact Test (TAS 201 and ASTM E1886/E1996)	9-lb, 2 x 4 @ 50ft/sec	PASS
Cyclic Load Test (TAS 203 and ASTM E1996)	+/- 65 psf Design Pressure	PASS

15.0 ELEVATION # E21 TEST RESULTS:

15.1 UNIFORM STATIC LOAD TEST RESULTS:

15.1.1 LOCATION OF DEFLECTION MEASURMENTS:



15.1.2 PERMENANT SET DATA:

POSITIVE LOAD:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.04	0.33
+65.00	0.07	0.33
+97.50	0.13	0.33

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.01	0.14
+65.00	0.03	0.14
+97.50	0.06	0.14

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5/4/07

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.00	0.17
+65.00	0.01	0.17
+97.50	0.02	0.17

NEGATIVE LOAD

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.07	0.33
-65.00	0.12	0.33
-97.50	0.19	0.33

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.05	0.14
-65.00	0.07	0.14
-97.50	0.11	0.14

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.02	0.17
-65.00	0.04	0.17
-97.50	0.07	0.17

15.1.3 REMARKS:

No signs of failure were observed in any area of this test specimen during the uniform static load test. As such, this specimen was found to satisfy the uniform static load test requirements of Florida Building Code TAS 202.

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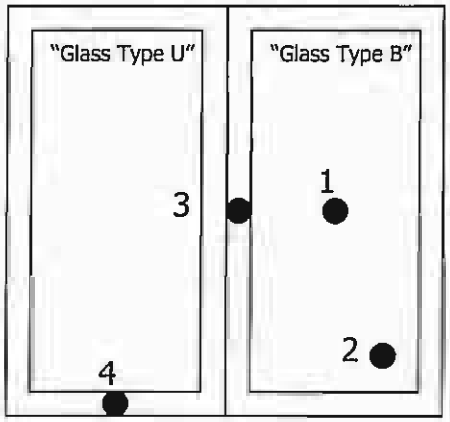
15.2 LARGE MISSILE IMPACT TEST

Impact #	Velocity (ft/s)	Glass Temperature (°F)	X Coordinate (in.)	Y Coordinate (in.)
1	50.15	68.5	57.00	48.00
2	49.80	68.5	63.00	21.00
3	49.83	N/A	40.00	44.00
4	49.75	N/A	20.00	5.00



15.1.4 IMPACT REMARKS:

Impacts for Test Units# E21 hit the intended targets resulting in the recorded measurements. There were no signs of penetration, rupture, or opening after the large missile impact test. Upon completion of the large missile impact test, this sample subsequently underwent the cyclic load test as specified Florida Building Code TAS 201 and ASTM E1886/1996.

15.2 CYCLIC LOAD TEST

15.2.1 TEST PARAMETERS:

Positive Design Load	65 psf
Negative Design Load	65 psf

15.2.2 TEST SPECTRUM:

Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
13 – 32.5 (psf)	**0 – 39 (psf)**	**32.5 – 52 (psf)**	**19.5 – 65 (psf)**
3500	300	600	100

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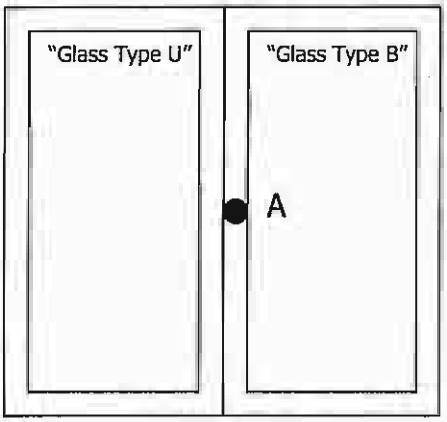
5/4/07

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
19.5 – 65 (psf)	32.5 – 52 (psf)	0 – 39 (psf)	13 – 35.5 (psf)
50	1050	50	3350

15.2.3 LOCATION OF DEFLECTION MEASUREMENTS:



15.2.4 PERMENANT SET DATA:

	INWARD (POSITIVE) LOAD		OUTWARD (NEGATIVE) LOAD	
Location	Measured Permanent Set (in.)	Allowable Permanent Set (in.)	Measured Permanent Set (in.)	Allowable Permanent Set (in.)
A	0.25	0.33	0.20	0.33

15.2.5 REMARKS:

The test units were inspected carefully upon completion of the cyclic test for failures. None were found. As such, this specimen was found to satisfy the cyclic test requirements of Florida Building Code TAS 203 and ASTM E1886/1996.

16.0 ELEVATION # E-22 TEST RESULTS

16.1 AIR INFILTRATION TEST RESULTS:

Test Pressure	Measured	Allowed
1.57 psf	0.61 cfm/ft^2	1.00 cfm/ft^2
6.24 psf	1.66 cfm/ft^2	N/A

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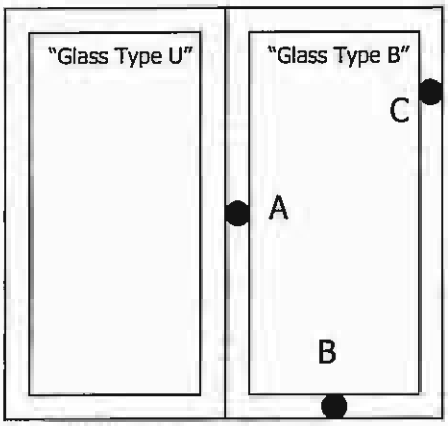
16.2 UNIFORM STATIC LOAD TEST RESULTS:

16.2.1 LOCATION OF DEFLECTION MEASURMENTS:



16.2.2 PERMENANT SET DATA:

POSITIVE LOADS:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.00	0.33
+65.00	0.03	0.33
+97.50	0.11	0.33

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.00	0.14
+65.00	0.00	0.14
+97.50	0.06	0.14

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.00	0.17
+65.00	0.00	0.17
+97.50	0.02	0.17

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5/4/07

NEGATIVE LOADS:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.02	0.33
-65.00	0.06	0.33
-97.50	0.10	0.33
LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.01	0.14
-65.00	0.03	0.14
-97.50	0.07	0.14
LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.00	0.17
-65.00	0.01	0.17
-97.50	0.03	0.17

16.2.3 REMARKS:

No signs of failure were observed in any area of this test specimen during the uniform static load test. As such, this specimen was found to satisfy the uniform static load test requirements of Florida Building Code TAS 202.

16.3 FORCED ENTRY RESISTANCE TEST RESULTS:

This specimen was tested in accordance with South Florida Building Code Section 3603.2 (b) 5. In accordance with the requirements of this test method, HTL technicians were unable to cause the doors to open. As such, this specimen was found to satisfy all the requirements of the forced entry resistance tests that were conducted.

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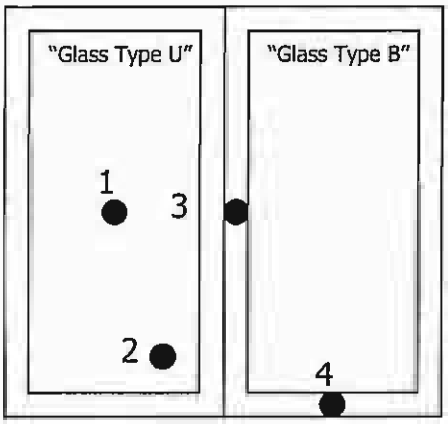
5/4/07

16.4 LARGE MISSILE IMPACT TEST:

Impact #	Velocity (ft/s)	Glass Temperature (°F)	X Coordinate (in.)	Y Coordinate (in.)
1	49.59	75.5	56.00	43.00
2	49.00	75.5	63.00	16.50
3	49.75	N/A	38.00	44.00
4	50.38	N/A	21.00	5.00



16.4.1 IMPACT REMARKS:

Impacts for Test Unit # E22 hit the intended targets resulting in the recorded measurements. There were no signs of penetration, rupture, or opening after the large missile impact test. Upon completion of the large missile impact test, this sample subsequently underwent the cyclic load test as specified Florida Building Code TAS 201 and ASTM E1886/1996.

16.5 CYCLIC LOAD TEST

16.4.2 TEST PARAMETERS:

Positive Design Load	65 psf
Negative Design Load	65 psf

16.4.3 TEST SPECTRUM:

Positve Loads:

# OF INWARD ACTING CYCLES/STAGE			
13 – 32.5 (psf)	**0 – 39 (psf)**	**32.5 – 52 (psf)**	**19.5 – 65 (psf)**
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
19.5 – 65 (psf)	**32.5 – 52 (psf)**	**0 – 39 (psf)**	**13 – 35.5 (psf)**
50	1050	50	3350

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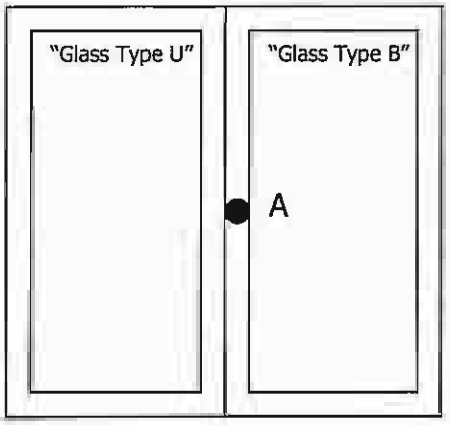
16.4.4 LOCATION OF DEFLECTION MEASURMENTS:



16.4.5 PERMENANT SET DATA:

	INWARD (POSITIVE) LOAD		OUTWARD (NEGATIVE) LOAD	
Location	Measured Permanent Set (in.)	Allowable Permanent Set (in.)	Measured Permanent Set (in.)	Allowable Permanent Set (in.)
A	0.25	0.33	0.18	0.33

16.4.6 REMARKS:

The test units were inspected carefully upon completion of the cyclic test for failures. None were found. As such, this specimen was found to satisfy the cyclic test requirements of Florida Building Code TAS 203 and ASTM E1886/1996.

MISCELLANEOUS INFORMATION

17.0 CERTIFICATION & DISCLAIMER STATEMENT:

All tests performed on this test specimen were conducted in accordance with the specifications of the applicable codes, standards & test methods listed below by the Hurricane Test Laboratory, LLC located at 1701 Westfork Drive, Suite 106, Lithia Springs, Georgia 30122. HTL does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products tested at HTL. HTL is not owned, operated or controlled by any company manufacturing or distributing products it tests. This report is only intended for the use of the entity named in section 1.0 of this report. Detailed assembly drawings showing wall thickness of all members, corner construction and hardware applications are on file and have been compared to the test specimen submitted. A copy of this test report along with representative sections of the test specimen will be retained at HTL for a period of four (4) years. All results obtained apply only to the specimen tested and they do indicate compliance with the performance requirements of the test methods and specifications listed in the following section.

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5/4/07

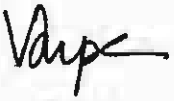
18.0 APPLICABLE CODES, STANDARDS & TEST METHODS:

ASTM E283 - Standard Test Method For Determining The Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences.
ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
ASTM E1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
ASTM E1996 – Standard Specification for Performance of Exterior Walls, Glazed Curtain Walls, Doors, and Storm Shutters Impacted by Windborne Debris in Hurricanes.
South Florida Building Code (SFBC) – Section 3603.2 (b) 5.
Florida Building Code TAS 201 – Impact Test Procedures.
Florida Building Code TAS 202 – Criteria For Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
Florida Building Code TAS 203 – Criteria For Testing Products Subject To Cyclic Wind Pressure Loading.

19.0 LIST OF OFFICIAL OBSERVERS (All or Partial):

Vinu J. Abraham, P.E. – HTL, Managing Partner
José E. Colón, E.I. – HTL, Operations Manager
Andrew Bush – HTL, Engineering Assistant
Ian McKenzie – HTL, Test Team
J.D. Williams – CORAL ARICHITECTURAL PRODUCTS

ENGINEER OF RECORD



5/4/07

HURRICANE TEST LABORATORY, LLC
TESTING AND EVALUATION SOLUTIONS
1701 WESTFORK DRIVE, SUITE 106
LITHIA SPRINGS, GEORGIA 30122
(770) 941-6916
Fax (770) 941-2930
www.htltest.com

MANUFACTURER'S IDENTIFICATION

1.0 NAME OF APPLICANT: CORAL ARCHITECTURAL PRODUCTS
3010 Rice Mine Road
Tuscaloosa, Alabama 35406
(800) 772-7737

2.0 CONTACT PERSON: J.D. Williams

3.0 HTL Test Notification: HTLGA07007

4.0 HTL Lab Certification: Miami-Dade County #04-0806.02
Florida Building Code #TST3892
IAS #TL-388

PRODUCT IDENTIFICATION (E23)

4.0 Product Types: Narrow Stile Door with Jackson 2086 concealed exit device.

5.0 Model Number: Coral Series 281 Narrow Stile Door installed into FL500 Framing.

6.0 Performance Class: +/- 65

7.0 Overall Size: 77" (w) x 86-1/2" (h)

8.0 Door Panel Sizes: Two operable door panels, each panel is 36" (w) x 84" (h)

9.0 Configuration: Operable pair of doors

10.0 Drawing: This test report is incomplete without the attached test unit drawing "281_01" (Sheets 1-12) bearing the raised seal of Hurricane Test Lab, LLC.

11.0 Sample Source: Samples provided by Coral Architectural Products

PRODUCT DESCRIPTION

12.0 MATERIAL CHARACTERISTICS:

12.1 Frame Construction: All of the main members of the frame were fabricated using the aluminum extrusions with the following cross-sectional properties:

Description	Part #	Overall Cross Section	Material
Head	FL507	2.500" x 5.000" x 0.080"	6063-T6
Jambs	FL504	2.500" x 5.000" x 0.094"	6063-T6
Jamb Anchor Plate	FL515	0.681" x 4.670" x 0.080"	6063-T6
Threshold	TH4	0.500" x 4.000" x 0.125"	6063-T6
Panic Stop	DP200-1	1.323" x 0.402" x 0.188"	6063-T6
Door Stop	DS500-1	0.648" x 1.260" x 0.094"	6063-T6

Note: See HTL Test Report Drawing 281-01 Sheet 4 for an overall view of this sample
The following construction procedures (typical) were utilized in the assembly of the frame:
Typical Frame Corner Construction: At each top corner, the frame jamb ran through while the frame head member was square cut, butted, and mechanically fastened to the frame jamb using four (4) #14 x 1" HH STS. At each bottom corner, the frame jamb member ran through while the threshold was square cut, butted and mechanically fastened to the frame jamb using 1.390" x 1.909" x 1/8" zinc plated steel clips (Coral Part # TH403) and four (4) each # 12-24 x 3/8" FHMS. Reference Drawing 281_01 Sheet 7 for exploded view of this assembly.
Door Stop Attachment: Each continuous head stop (Part DS500-1) was mechanically attached with three (3) each#10 x 1-3/4" FHPUC TEK fasteners located at midpoint and 10" from each

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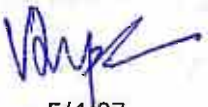

5/4/07
Vinu J. Abraham, P.E.
FL Reg. # 53820

end and each jamb stop was attached three (3) #10 x 1-1/4" FHPUC TEK fasteners located at midpoint and 10" from each end. The panic stop (Part # DP200-1) was mechanically applied to the threshold using two (2) #10-19 x ½" FHP TEK screws. Reference Drawing 281_1, Sheet 7 for exploded view of this assembly.
Frame Filler: Each continuous flat filler plate (Part # FL515) was snap applied to each jamb.
Frame Corner Sealant: At each frame head corner the joint was sealed using strips of SM5601 Schnee-Moorehead TackyTape ® Industrial Tape Sealant. At the bottom corner, the threshold was sealed to the vertical members using Dow 795 silicone sealant.

12.2 **Door Construction:** Each of the door leaves were fabricated using some are all of the following aluminum extrusions:

Description	Part #	Overall Cross Section	Alloy
Door Hinge Stiles	D103	2.125" 1.750" x 0.120"	6063-T6
Door Active Meeting Stile	D105	1.989" x 1.750" x 0.120"	6063-T6
Door Inactive Meeting Stile	D104	2.125" x 1.750"x 0.120"	6063-T6
Door Bottom Rail	D108	7.500" x 1.710" x 0.120"	6063-T6
Door Bottom Rail	D109	9.500" x 1.710" x 0.120"	6063-T6
Door Top Rail	D101	2.250" x 1.710" x 0.120"	6063-T6
Adjustable Astragal	D106	0.331" x 1.562" x 0.062"	6063-T6
Door Bottom Rail Sweep	WS100	0.812" x 0.302" x 0.125"	6063-T6
Glass Stops (applied)	DG501	1.000" x 0.539" x 0.065"	6063-T6
Glass Stops (snap-in)	DG502	0.500" x 0.625" x 0.055"	6063-T6

The following construction procedures (typical) were utilized when assembling each door leaf:
Door Panel Corner Construction: At each door corner, both rail ends were square cut, butted, and attached together using door corner block (Part# CB101 for the top rail and (Part # CB108) for the bottom rail). At each top door panel corner, the horizontal rail was mechanically fastened to the stile with the corner blocks using one (1), 3/8-16 x ¾" HWH zinc plated cap bolt threaded into a 1.475" x 1.475" x 0.180 zinc plated square nut (Part # AS13) positioned inside the stile. At each bottom door panel corner, the horizontal rail was mechanically fastened to the stile with the corner blocks using two (2), 3/8-16 x ¾" HWH Zinc plated cap bolts threaded into two (2) 1.475" x 1.475" x 0.180 Zinc plated square nuts (Part # AS13) positioned inside the stile. Additionally, four (4) #10 x ¾" PFH Type "B" Zinc plated fasteners were used to attach each end of the top and bottom rails to the corner block. The door panel corners were not welded. Reference Drawing 281_01 Sheet 5 of 12 for exploded view details of the typical Top and Bottom rail corner construction.
Door Leaf Corner Sealant: None used.
Miscellaneous Construction: A continuous aluminum sweep (Part # WS136) is applied along the bottom edge o each door leaf. Each sweep is secured to the bottom door rail of the door leaf using three (3) #8 x ¾" POH TEK fasteners. A continuous adjustable astragal (Part # D106) is applied to the active door leaf meeting stile using a single row of #8 x ¾" POH TEK fasteners located at approximately 4" and 18" from the bottom edge and 4", 18" and 32"from the top edge. One cone steel spring (Part # SP100) was included at each fastener location
Glazing Stop Construction: The lites of glass used in this sample were glazed to the door stiles and rails using DG501 glass stop on the interior side and DG502 snap-in on the exterior. DG501 is secured to the interior door stiles with 3 each CS501-1 clips located at midpoint and 10" from each end. Each CS501-1 is attached to the stiles with one (1) each #8 x ¾" POH TEK fastener. DG501 is attached to the top and bottom rails using 2 each CS501-1 clips located 10" from each end. Each CS501-1 clip is attached with one (1) (8 x ¾" POH TEK fastener. Reference sheet 12 of attached drawings for additional information.

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12.3 Glazing:

12.3.1 Glazing Materials:

Glass Type "U": 0.620" laminated glass with the following components:

- ¼" heat strengthened glass
- 0.120" Uvekol "S" Interlayer
- ¼"" heat strengthened glass

Glass Type B: 0.590" laminated glass with the following components:

- ¼" heat strengthened glass
- 0.090" Solutia SAFLEX PVB Interlayer
- ¼" heat strengthened glass

12.3.2 Glazing Method: Each lite of glass used in each door leaf was glazed using the following (typical) procedures:
DG502 Glass Stop: Using a single row of 0.188 EPDM glazing gasket (Part # NG1).
DG501 Glass Stop: Using a single row of 0.094 EPDM spacer gasket (Part # NG13) followed by a ¼" x ½" continuous bead of Dow Corning 995 structural silicone sealant.

12.3.2 Daylight Opening:

Qty.	Location	Daylight Opening	Glass Bite	Glass Type
1	Inactive Door Panel	29-9/16" (w) x 71-7/16" (h)	¾"	U
1	Active Door Panel	29-9/16" (w) x 71-7/16" (h)	¾"	B

12.4 Weather-stripping:

Qty.	Location	Description
20-lf.	Frame head and jambs	EPDM (Part # NG5)
14-lf.	Two rows along adjustable astragal.	Schlegel wool pile (Part # WP106)
6-lf.	Along back of bottom of door panels	Coral vinyl weathering strip (Part # VG1)

12.5 Hardware:

Qty.	Location	Description
6	Three (3) per door panel, located on door panel hinge stile, 6" from the top edge, 9" and 45-11/32 from the bottom edge.	Butt Hinge (Part #DH109). Each hinge was attached to the frame jamb using four (4) #12-24 x ½", and to the door stile using four (4) #12-24 x ½".
2	Exterior of Active an Inactive (top of pull handle) is located 47" from bottom edge of door.	Coral pull handle (Part # PH401)
1	Exterior of Active door	Cylinder (Part # DH078)
1	Interior of Active door (centerline is 38-5/32" from bottom edge of door)	Jackson 2086 concealed exit device
1	Interior of inactive door (centerline is 38-5/32" from bottom edge of door)	Jackson 2086 concealed exit device
2	Bottom of doors	Coral door bottom sweep (Part # WS136)

12.6 Sealant's Used:

Location	Sealant
Perimeter Sealant	Dow Corning 795 Silicone Sealant
Frame Joint Sealant	Schnee-Moorehead SM5601TackyTape Industrial Tape Sealant

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INSTALLATION

13.0 Following is a description of how this sample was installed in the steel test buck when viewed from the exterior:

Location	Fastener	Fastener Schedule
Frame Head	Attached to the opening using two (2), 3/8" x 1-1/2" HWH STC" bolts	One each 2-1/2" on each side of the geometric centerline.
Frame Jambs	Attached to the opening using four (3/8" x 3-1/2" GRD 2 with nuts and washers	5" from the top end and 2-3/8", 45", and 51" from the bottom end.
Threshold	Attached to the steel substrate using four (4), #12 x 1-1/2" #3 TEK screws	One 2" and 4" on each side of the geometric centerline.

NOTE: There was a ¼" shim space used around the perimeter of each test sample at the head, sill and jamb locations.

TEST RESULTS

14.0 SUMMARY OF RESULTS:

Test Method	Test Conditions	Test Conclusion
Air Infiltration Test (ASTM E283 & TAS 202)	1.57 psf & 6.24 psf	PASS
Uniform Static Load Test (ASTM E330 & TAS 202)	+/- 65 psf Design Pressure	PASS
Forced Entry Resistance Test (TAS 202)	300-lb.	PASS
Large Missile Impact Test (TAS 201 and ASTM E1886/E1996)	9-lb, 2 x 4 @ 50ft/sec	PASS
Cyclic Load Test (TAS 203 and ASTM E1996)	+/- 65 psf Design Pressure	PASS

15.0 ELEVATION E-23 TEST RESULTS

15.1 AIR INFILTRATION TEST RESULTS:

Test Pressure	Measured	Allowed
1.57 psf	0.25 cfm/ft^2	1.00 cfm/ft^2
6.24 psf	0.79 cfm/ft^2	N/A

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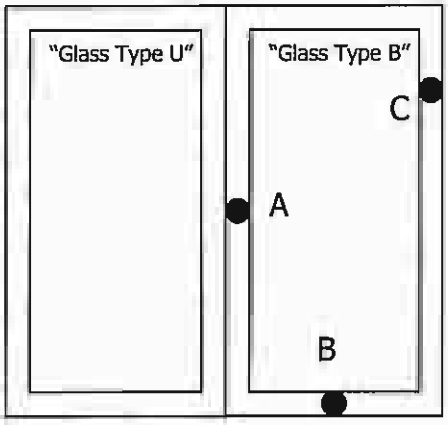
15.2 UNIFORM STATIC LOAD TEST RESULTS:

15.2.1 LOCATION OF DEFLECTION MEASURMENTS:



15.2.2 PERMENANT SET DATA:

POSITIVE LOADS:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.04	0.33
+65.00	0.07	0.33
+97.50	0.11	0.33
LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.01	0.14
+65.00	0.03	0.14
+97.50	0.06	0.14

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LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+48.75	0.01	0.17
+65.00	0.02	0.17
+97.50	0.03	0.17

NEGATIVE LOADS:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.06	0.33
-65.00	0.10	0.33
-97.50	0.14	0.33

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.04	0.14
-65.00	0.05	0.14
-97.50	0.07	0.14

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
-48.75	0.02	0.17
-65.00	0.03	0.17
-97.50	0.04	0.17

15.2.3 REMARKS:

No signs of failure were observed in any area of this test specimen during the uniform static load test. As such, this specimen was found to satisfy the uniform static load test requirements of Florida Building Code TAS 202.

15.3 FORCED ENTRY RESISTANCE TEST RESULTS:

This specimen was tested in accordance with South Florida Building Code Section 3603.2 (b) 5. In accordance with the requirements of this test method, HTL technicians were unable to cause the doors to open. As such, this specimen was found to satisfy all the requirements of the forced entry resistance tests that were conducted.

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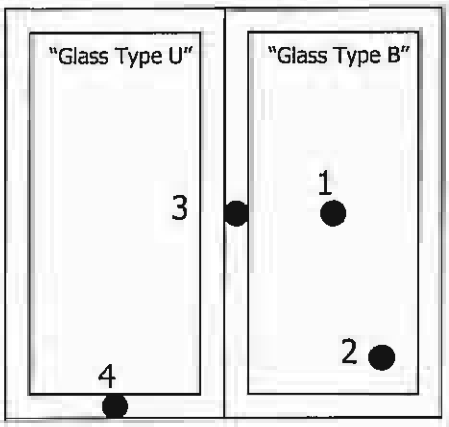
15.4 LARGE MISSILE IMPACT TEST:

Impact #	Velocity (ft/s)	Glass Temperature (°F)	X Coordinate (in.)	Y Coordinate (in.)
1	48.59	75.5	56.00	43.00
2	49.00	75.5	63.00	16.50
3	49.75	N/A	38.00	44.00
4	50.38	N/A	21.00	5.00



15.4.1 IMPACT REMARKS:

Impacts for Test Unit # E23 hit the intended targets resulting in the recorded measurements. There were no signs of penetration, rupture, or opening after the large missile impact test. Upon completion of the large missile impact test, this sample subsequently underwent the cyclic load test as specified Florida Building Code TAS 201 and ASTM E1886/1996.

15.5 CYCLIC LOAD TEST

15.5.1 TEST PARAMETERS:

Positive Design Load	65 psf
Negative Design Load	65 psf

15.5.2 TEST SPECTRUM:

Positve Loads:

# OF INWARD ACTING CYCLES/STAGE			
13 – 32.5 (psf)	**0 – 39 (psf)**	**32.5 – 52 (psf)**	**19.5 – 65 (psf)**
3500	300	600	100

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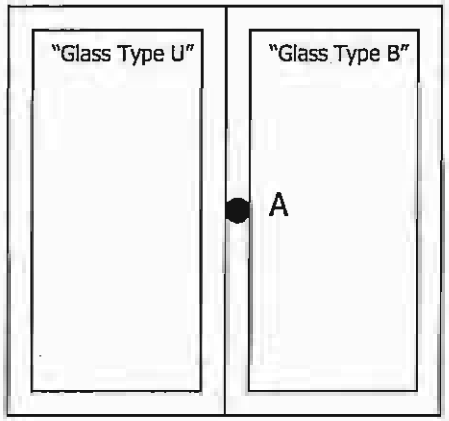
Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
19.5 – 65 (psf)	32.5 – 52 (psf)	0 – 39 (psf)	13 – 35.5 (psf)
50	1050	50	3350

15.5.3 LOCATION OF DEFLECTION MEASURMENTS:



15.5.4 PERMENANT SET DATA:

	TEST UNIT # 1B			
	INWARD (POSITIVE) LOAD		OUTWARD (NEGATIVE) LOAD	
Location	Measured Permanent Set (in.)	Allowable Permanent Set (in.)	Measured Permanent Set (in.)	Allowable Permanent Set (in.)
A	0.20	0.33	0.13	0.33

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MISCELLANEOUS INFORMATION

16.0 CERTIFICATION & DISCLAIMER STATEMENT:

All tests performed on this test specimen were conducted in accordance with the specifications of the applicable codes, standards & test methods listed below by the Hurricane Test Laboratory, LLC located at 1701 Westfork Drive, Suite 106, Lithia Springs, Georgia 30122. HTL does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products tested at HTL. HTL is not owned, operated or controlled by any company manufacturing or distributing products it tests. This report is only intended for the use of the entity named in section 1.0 of this report. Detailed assembly drawings showing wall thickness of all members, corner construction and hardware applications are on file and have been compared to the test specimen submitted. A copy of this test report along with representative sections of the test specimen will be retained at HTL for a period of four (4) years. All results obtained apply only to the specimen tested and they do indicate compliance with the performance requirements of the test methods and specifications listed in the following section

17.0 APPLICABLE CODES, STANDARDS & TEST METHODS:

ASTM E283 - Standard Test Method For Determining The Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences.
ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
ASTM E1886 – Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials.
ASTM E1996 – Standard Specification for Performance of Exterior Walls, Glazed Curtain Walls, Doors, and Storm Shutters Impacted by Windborne Debris in Hurricanes.
South Florida Building Code (SFBC) – Section 3603.2 (b) 5.
Florida Building Code TAS 201 – Impact Test Procedures.
Florida Building Code TAS 202 – Criteria For Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
Florida Building Code TAS 203 – Criteria For Testing Products Subject To Cyclic Wind Pressure Loading.

18.0 LIST OF OFFICIAL OBSERVERS (All or Partial):

Vinu J. Abraham, P.E. – HTL, Managing Partner
José E. Colón, E.I. – HTL, Operations Manager
Andrew Bush – HTL, Engineering Assistant
Ian McKenzie – HTL
J.D. Williams – CORAL ARICHITECTURAL PRODUCTS

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5/4/07

DRAWINGS

HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

INDEX TO DRAWINGS

ABBREVIATIONS:
D.L.O. = DAY LIGHT OPENING
D.O.H. = DOOR OPENING HEIGHT
D.O.W. = DOOR OPENING WIDTH
C.V.R. = CONCEALED VERTICAL ROD

Hurricane Test Laboratory
HTL
Tested unless Otherwise Noted
Date 5/2/07
Job # G-607-0104-07

REV	BY	DATE	DESCRIPTION
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Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-255-7320

HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

INDEX OF DRAWINGS

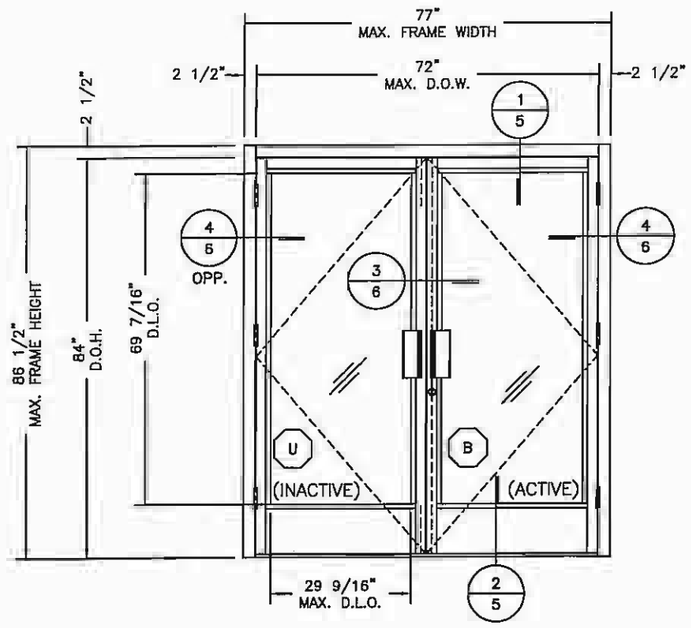
DATE 4/18/2007

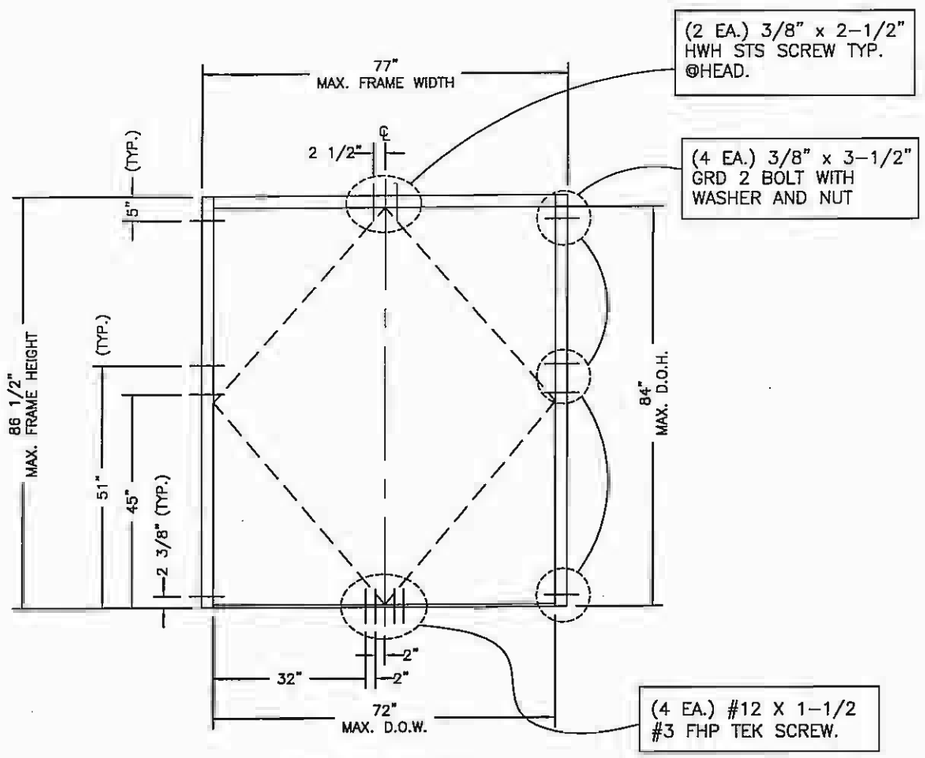
DRAWN	CHECKED	APPROVED
MLL	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 281_01

SHEET 1 OF 12





ANCHOR LOCATIONS

ELEVATION E21
SERIES 281 DOORS WITH 3-POINT LOCK

TESTING
AIR, STATIC, FORCED ENTRY, IMPACT AND CYCLE

DESIGN PRESSURE = +65/-65 PSF

STEEL TEST BUCK

0 1'-4" 2'-8" 5'-4"

SCALE: 3/8"=1'-0"

Hurricane Test Laboratory
HTL
Tested unless Otherwise Noted
Date 5/2/07
Job # 6402-0304-07

REV	BY	DATE	DESCRIPTION
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Coral
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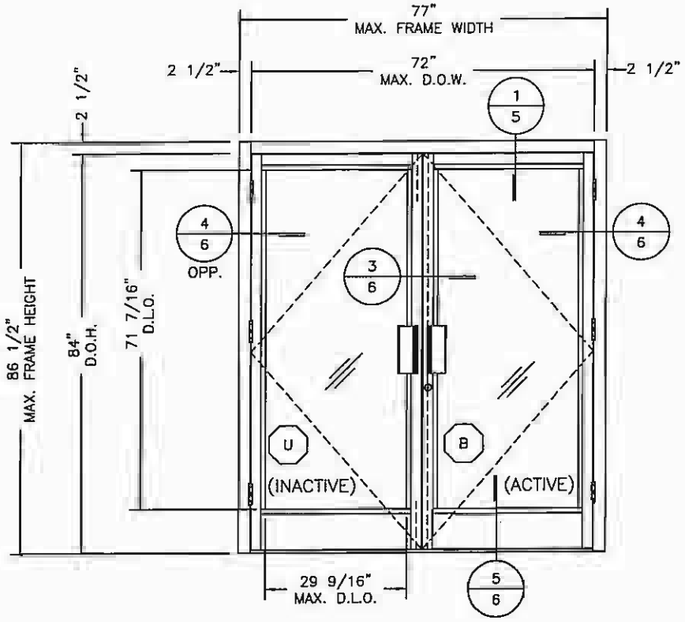
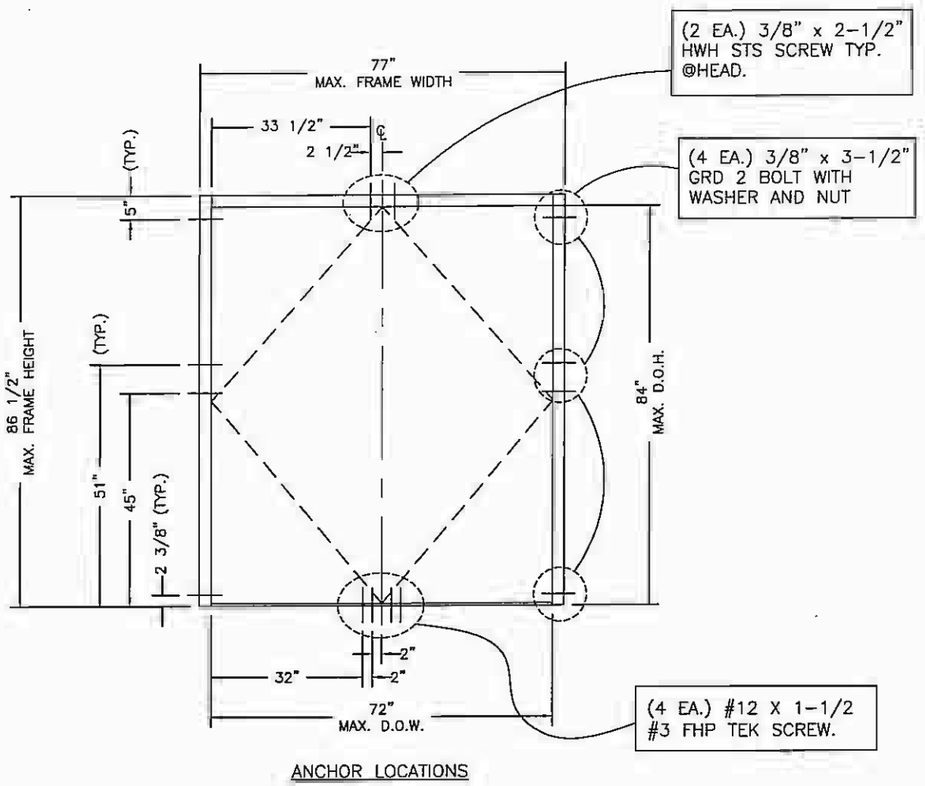
HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

DOOR AND FRAMING ELEVATIONS

DATE	
4/18/2007	
DRAWN: MLL	CHECKED: JDW	APPROVED: JDW
PROJECT NO.: HTL TEST	
DRAWING NO.: 281_01	
SHEET: 2 OF 12	

C:\Assembling Art Fabrication & PIVOCK\DSW\TL\281_0412 ELEVATION FOR SERIES 281 DOORS.dwg 3/2/2007 9:51:10 AM





ANCHOR LOCATIONS

ELEVATION E22
SERIES 281 DOORS WITH 3-POINT LOCK

TESTING
STATIC, IMPACT AND CYCLE

DESIGN PRESSURE = +65/-65 PSF

STEEL TEST BUCK

0 1'-4" 2'-8" 5'-4"

SCALE: 3/8"=1'-0"

Hurricane Test Laboratory

Tested unless Otherwise Noted

Date 5/2/07

Job # 6-402-0206-07

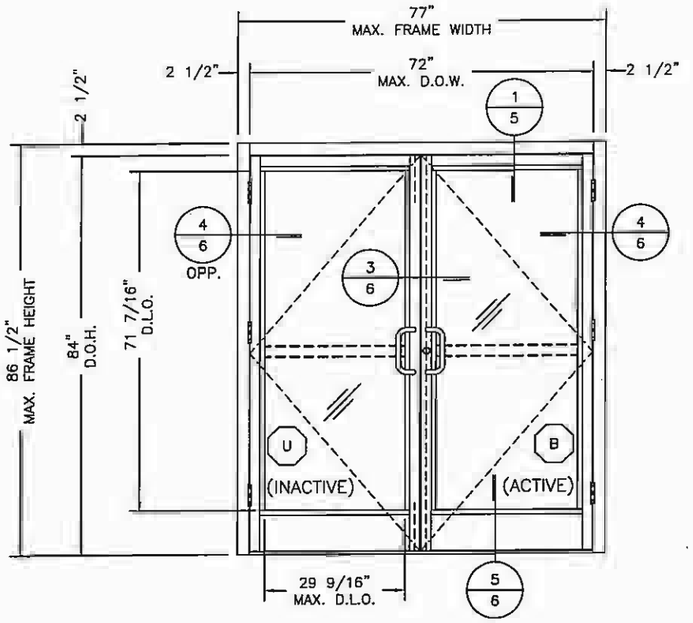
REV	BY	DATE	DESCRIPTION

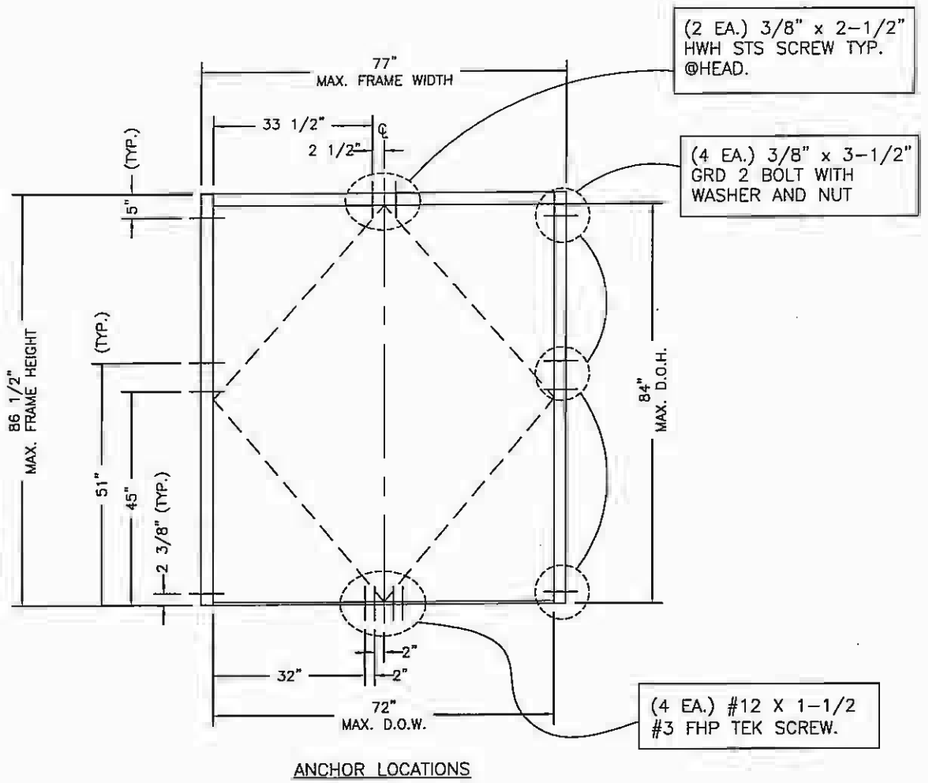
Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6261

HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

DOOR AND FRAMING ELEVATIONS

DATE	4/18/2007		
DRAWN MLL	CHECKED JDW	APPROVED JDW	
PROJECT NO.	HTL TEST		
DRAWING NO.	281_01		
SHEET	3 OF 12		





ANCHOR LOCATIONS

ELEVATION E23
SERIES 281 DOORS WITH JACKSON 2086 EXIT DEVICES

TESTING
AIR, STATIC, FORCED ENTRY, IMPACT AND CYCLE

DESIGN PRESSURE = +65/-65 PSF

STEEL TEST BUCK

0 1'-4" 2'-8" 5'-4"

SCALE: 3/8"=1'-0"

Hurricane Test Laboratory

Tested unless Otherwise Noted

Date 5/2/07

Job # 6407-0304-07

REV	BY	DATE	DESCRIPTION
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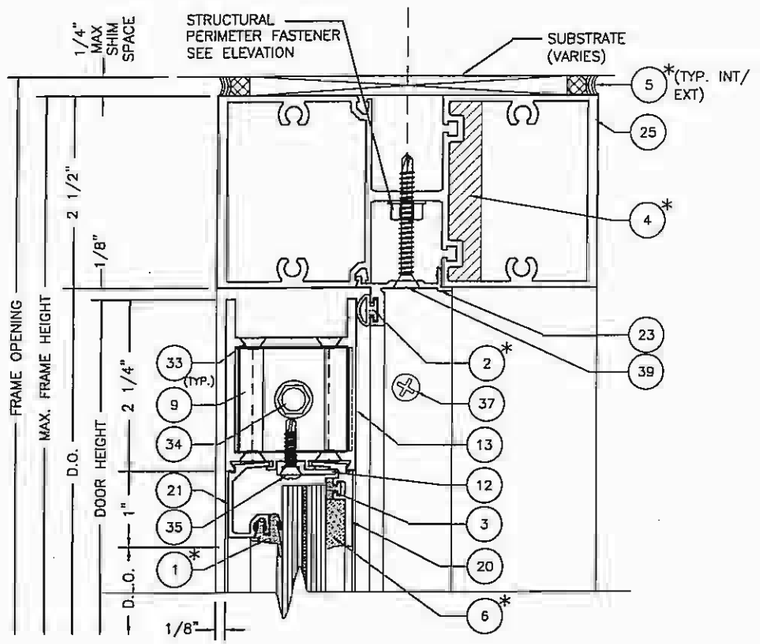
Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-443-6261

HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

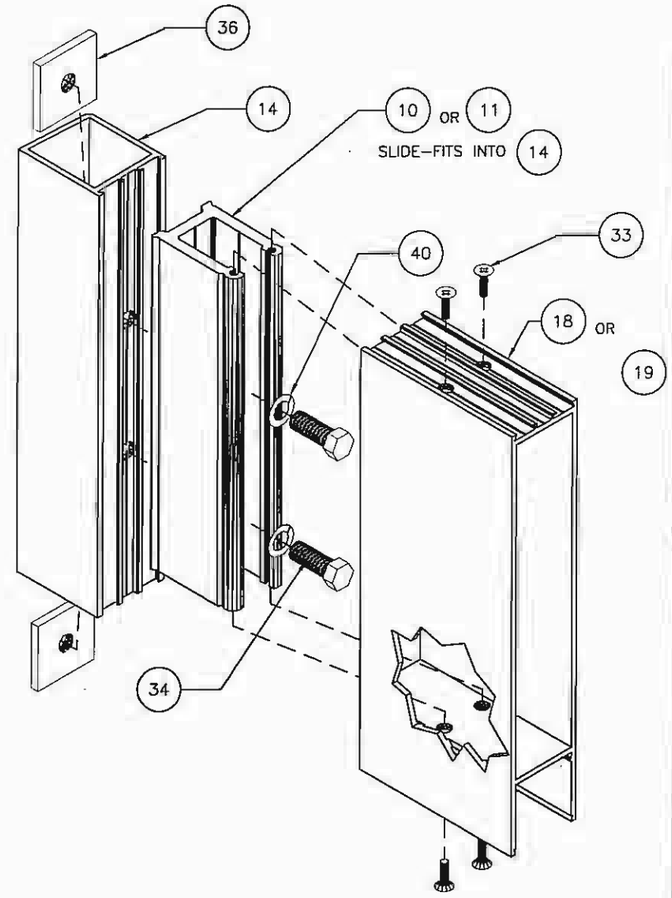
DOOR AND FRAMING ELEVATIONS

DATE	4/18/2007	
DRAWN MLL	CHECKED JDW	APPROVED JDW
PROJECT NO.	HTL TEST	
DRAWING NO.	281_01	
SHEET	4 OF 12	

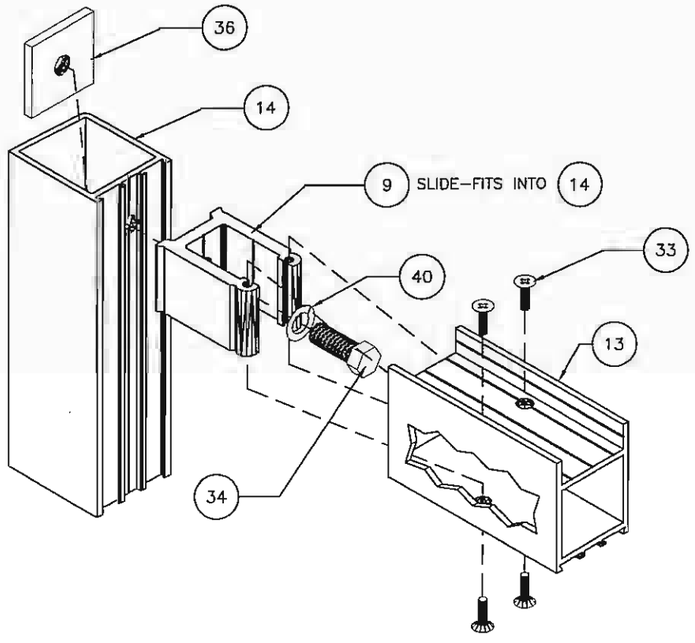


1 – HEADER FOR SURFACE CLOSER
1:2

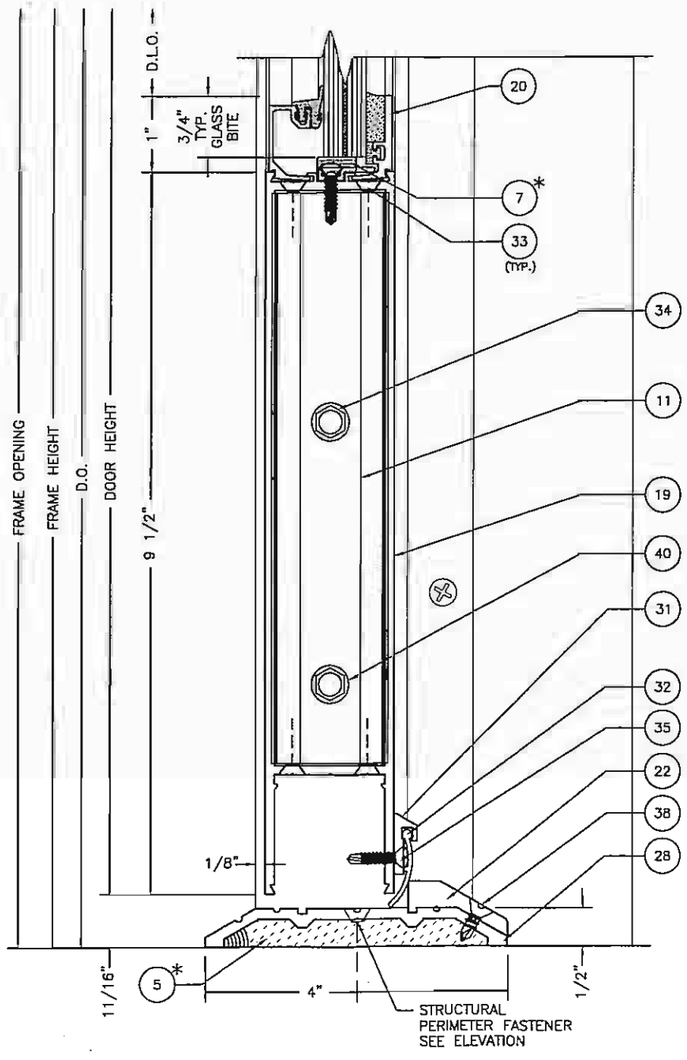
1* TYPICAL EXTERIOR GASKET	6* TYPICAL INTERIOR SEALANT @GLASS
2* TYPICAL INTERIOR SPACER GASKET	7* TYPICAL EA. END INTERM. HORIZONTAL
4* TYPICAL @ALL JOINT INTERSECTIONS	8* TYPICAL @ALL SPLINES
5* TYPICAL EXT/INT PERIMETER SEALANT	



TYPICAL BOTTOM RAIL CONSTRUCTION
NTS



TYPICAL TOP RAIL CONSTRUCTION
NTS



2 – THRESHOLD
1:2

Hurricane Test Laboratory
Tested unless Otherwise Noted
Date 5/4/07
Job # 6-602-0104-07

REV	BY	DATE	DESCRIPTION

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PHONE: 800-772-7737 FAX: 800-255-7320

HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

DOOR AND FRAMING DETAILS

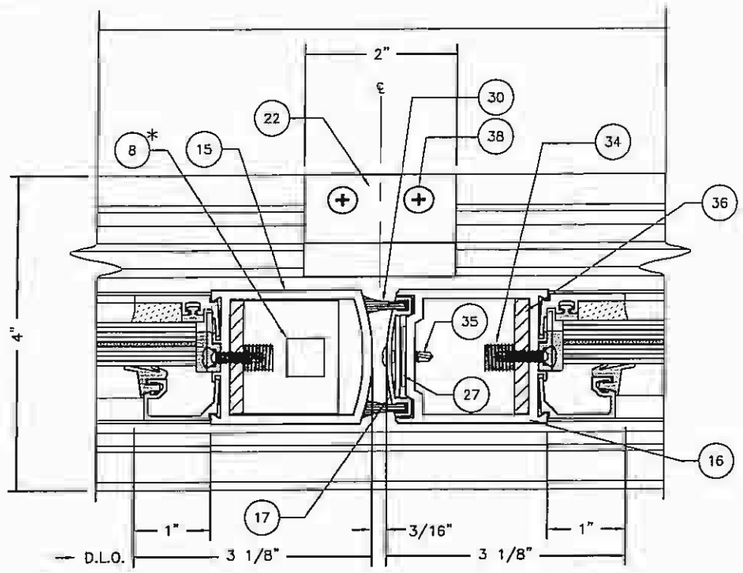
DATE 4/18/2007

DRAWN	CHECKED	APPROVED
MLL	JDW	JDW

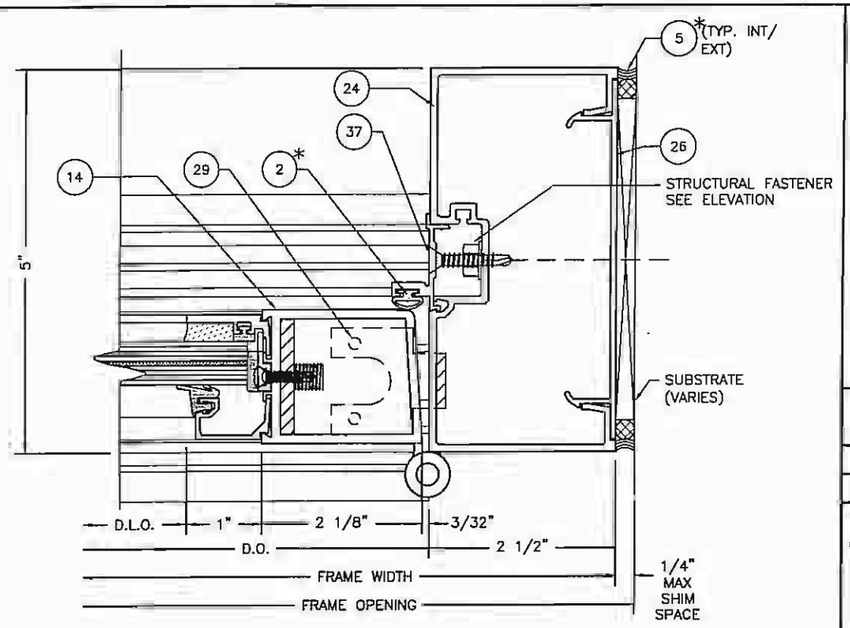
PROJECT NO. HTL TEST

DRAWING NO. 281_01

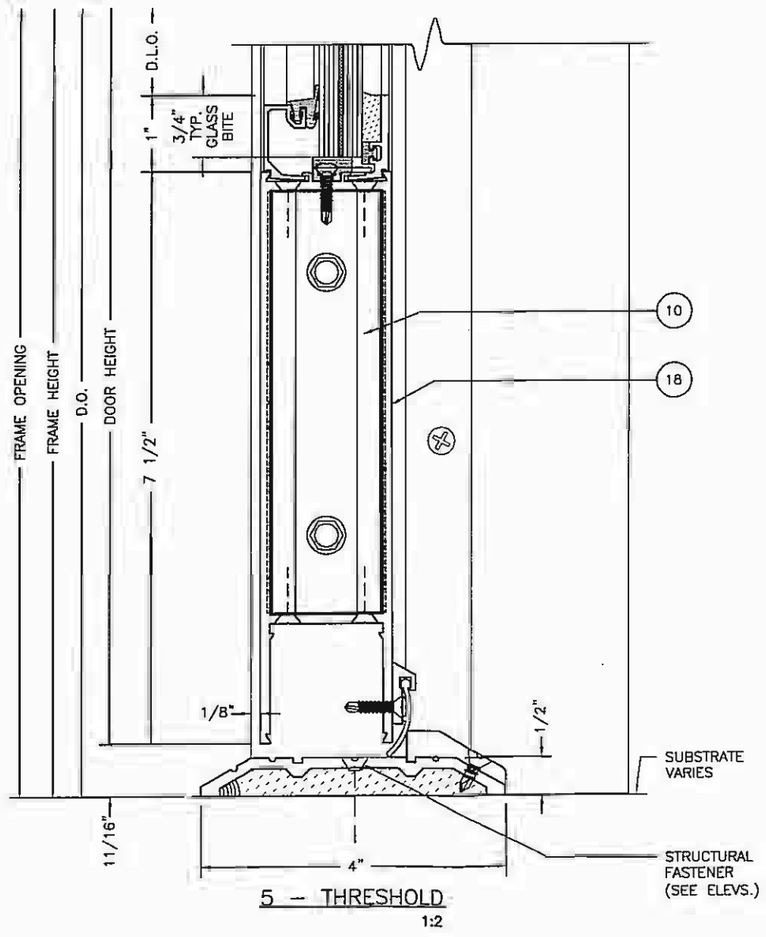
SHEET 5 OF 12



3 – MEETING STILES
1:2



4 – DOOR JAMB
1:2



5 – THRESHOLD
1:2

Hurricane Test Laboratory
Tested unless Otherwise Noted
Date 5/2/07
Job # G402-0404-02

REV	BY	DATE	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

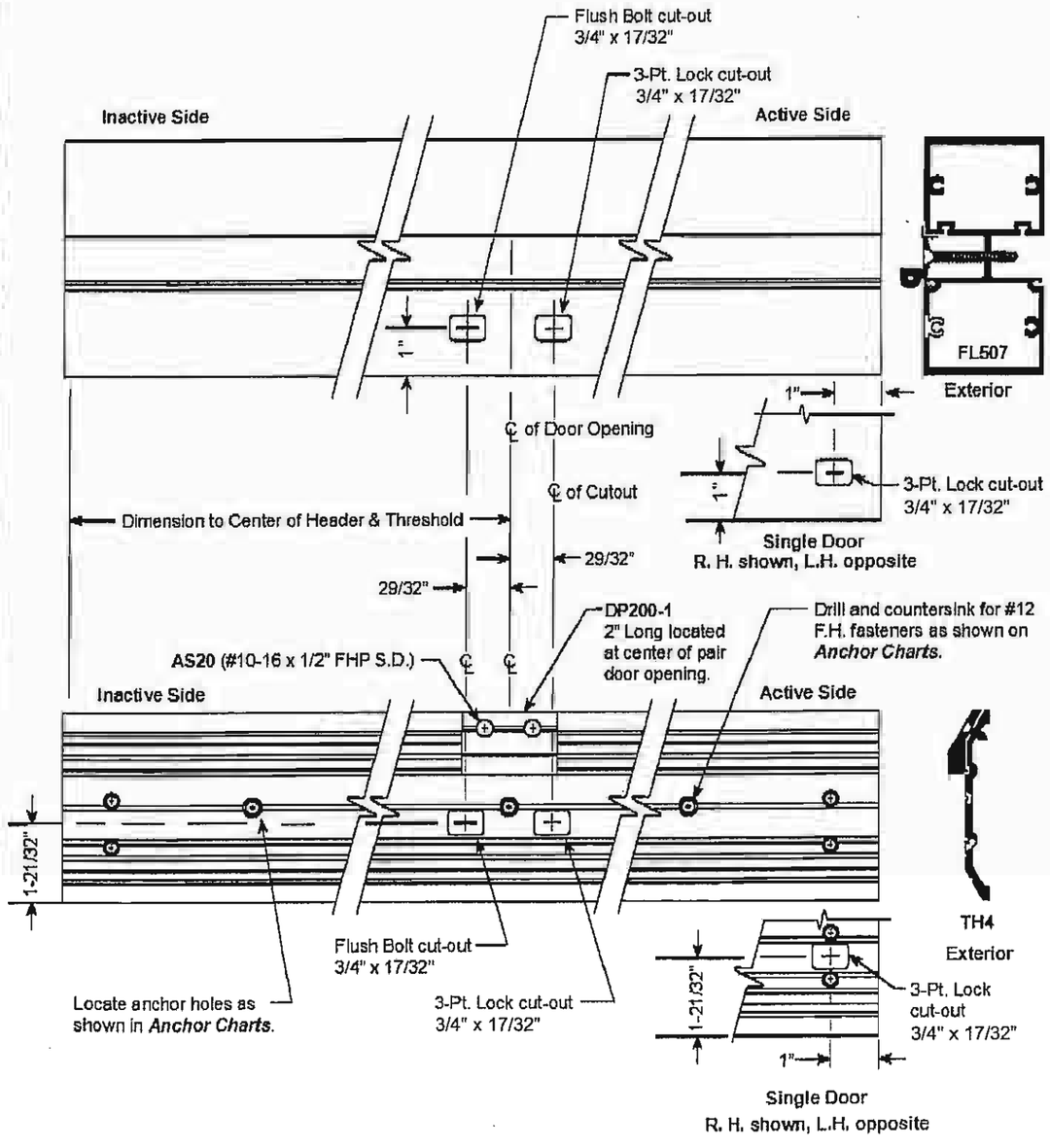
DOOR AND FRAMING DETAILS

DATE		
4/18/2007		
DRAWN MLL	CHECKED JDW	APPROVED JDW
PROJECT NO. HTL TEST		
DRAWING NO. 281_01		
SHEET 6 OF 12		

FLUSH BOLT & 3 PT. LOCK STRIKE LOCATIONS

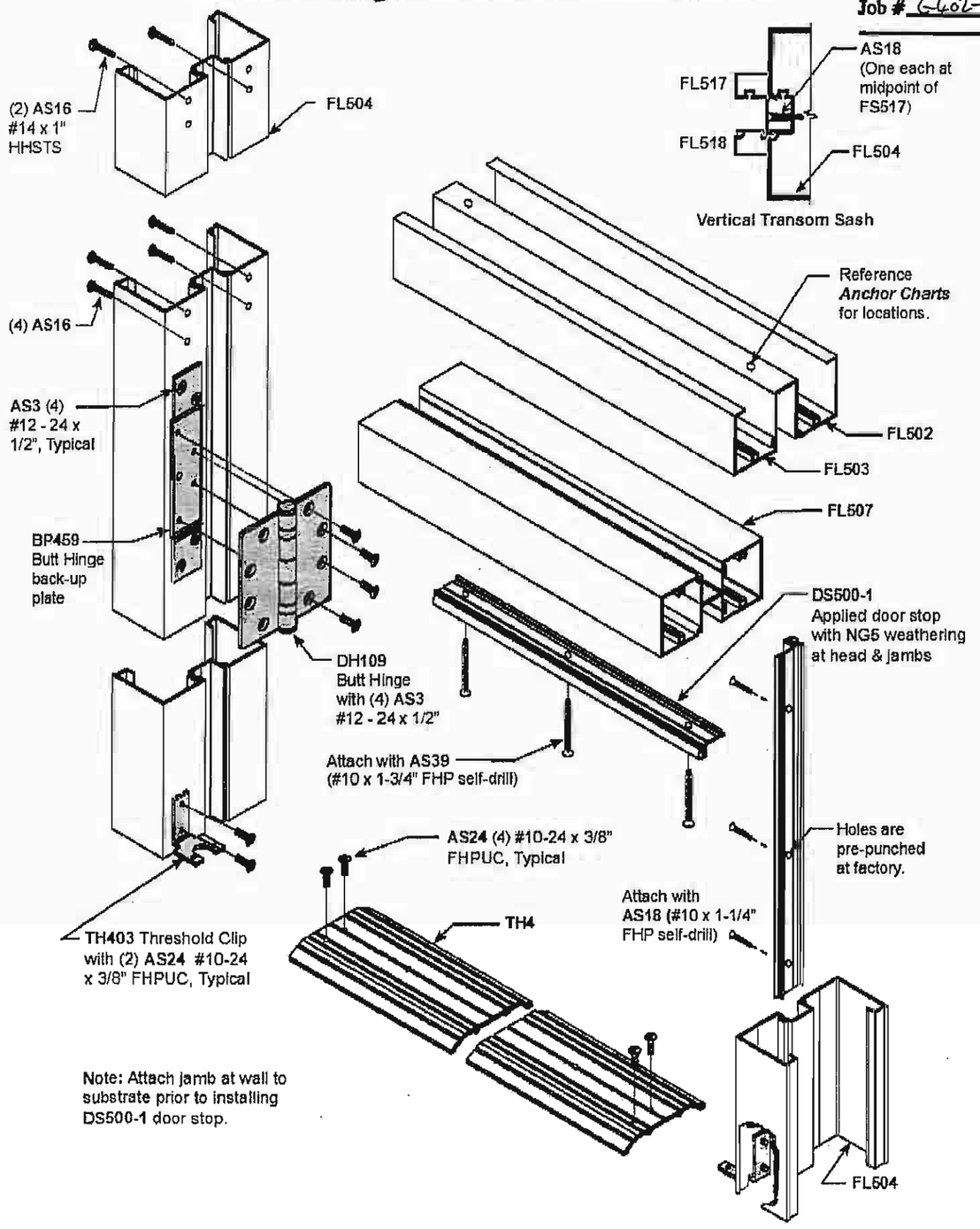
F5 or FT5 Open Back Frame for Butt Hung Door
Surface or Concealed Overhead Closer

FL507 Header Fabrication Shown for Surface Closer.
FL512 Header Fabrication Similar for C.O.C.



F5 OPEN BACK FRAME AND/OR FT5 TRANSOM

For Butt Hung Door for Surface Closer



Note: Attach jamb at wall to substrate prior to installing DS500-1 door stop.

Hurricane Test Laboratory
HTL
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Date 5/2/07
Job # 6-402-05-04

REV	BY	DATE	DESCRIPTION

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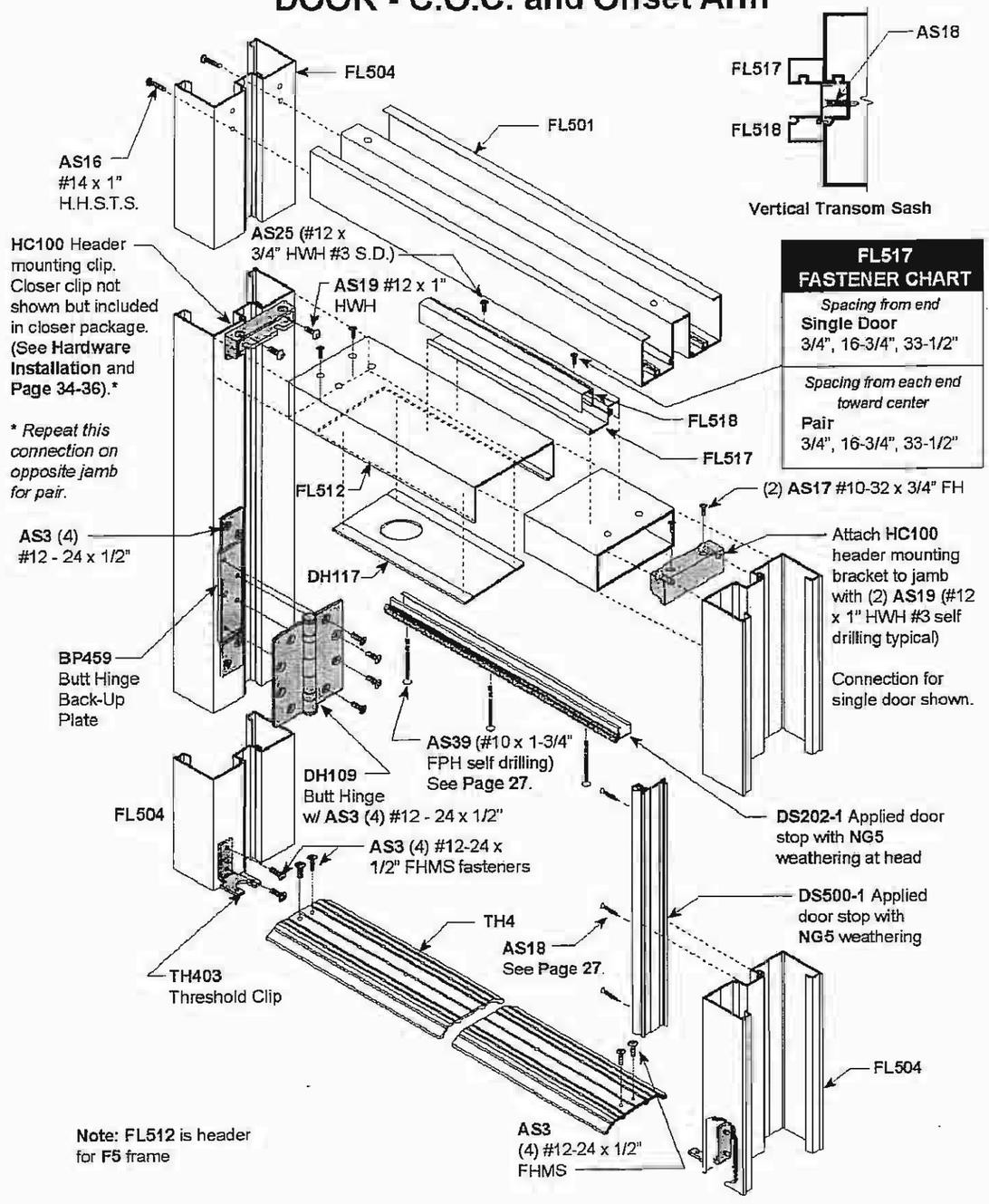
HTL TEST REPORT DRAWINGS FOR SERIES
281 HURRICANE IMPACT-RESISTANT
DOORS IN FL500 FRAMING

DOOR AND FRAMING DETAILS

DATE	4/18/2007	
DRAWN MLL	CHECKED JDW	APPROVED JDW
PROJECT NO.	HTL TEST	
DRAWING NO.	281_01	
SHEET	7 OF 12	

F5 or FT5 FRAME - OFFSET BUTT HUNG DOOR - C.O.C. and Offset Arm



FL517 FASTENER CHART	
Spacing from end	
Single Door	3/4", 16-3/4", 33-1/2"
Spacing from each end toward center	
Pair	3/4", 16-3/4", 33-1/2"

Hurricane Test Laboratory
Tested unless Otherwise Noted
Date 5/4/07
Job # 04-0304-07

REV	BY	DATE	DESCRIPTION
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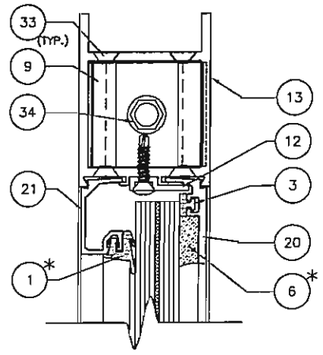
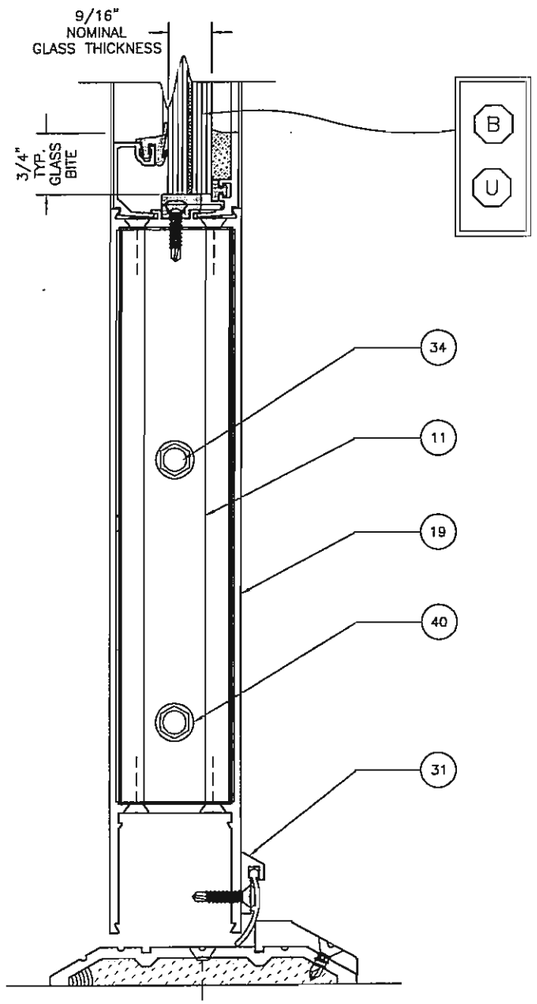
HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

DOOR AND FRAMING DETAILS

DATE	4/18/2007		
DRAWN PCH	CHECKED JDW	APPROVED JDW	
PROJECT NO.	HTL TEST		
DRAWING NO.	281_01		
SHEET	8 OF 12		



GLAZING DETAIL – TOP RAIL
1:2



GLAZING DETAIL – BOTTOM RAIL
1:2

GLAZING SCHEDULE

GLASS MARK SYMBOL	GLASS TYPE	MANUFACTURER	MAXIMUM DLO SIZE	MAXIMUM SQUARE FEET
B	1/4" H.S. AT INNER/OUTER FACES WITH 0.090 SOLUTIA "SAFLEX" PVB INTERLAYER	SOLUTIA N.O.A. = 03-0105.02	29 9/16" x 71 7/16"	14.7
U	1/4" H.S. AT INNER/OUTER FACES WITH 0.120 UVEKOL "S" INTERLAYER	UVEKOL N.O.A. = 03-1117.05	29 9/16" x 71 7/16"	14.7

TYPICAL DOOR GLASS SIZE = DLO + 1–1/2"

Hurricane Test Laboratory
Tested unless
Otherwise Noted
Date 5/4/07
Job # 0402-0304-07

REV	BY	DATE	DESCRIPTION
-	-	-	-

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HTL TEST REPORT DRAWINGS FOR SERIES
281 HURRICANE IMPACT-RESISTANT
DOORS IN FL500 FRAMING

GLAZING SCHEDULE

DATE	4/18/2007	
DRAWN MLL	CHECKED JDW	APPROVED JDW
PROJECT NO.	HTL TEST	
DRAWING NO.	281_01	
SHEET	9 OF 12	

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
1	NG1	EXTERIOR/INTERIOR GLAZING GASKET	0.188 SPACE	EPDM	VARIES	
2	NG5	BULB GASKET FOR (23)	0.260 X SPACE	EPDM	VARIES	
3	NG13	SPACER GASKET FOR (20)	0.201 X 0.288	EPDM	VARIES	
4	SM5601	JOINT SEALANT TAPE	0.500 X 0.125 X VARIES	BUTYL	SCHNEE-MOOREHEAD	
5	795	SILICONE- PERIMETER SEALANT	FILL SPACE	SILICONE	DOW CORNING	USED AT PERIMETER
6	995	SILICONE-GLASS TO METAL	FILL SPACE	SILICONE	DOW CORNING	GLASS TO METAL
7	SB11	DOOR-SETTING/ EDGE BLOCK	0.523 X 0.319 X 4"	EPDM	VARIES	
8	BP213	STEEL BACK-UP PLATE/FLUSH BOLT GUIDE	1.475 X 3.282 X 1.438 X 0.180	ZINC PLATED STEEL	VARIES	
9	CB101	DOOR CORNER BLOCK	1.540 X 1.350 X 0.250	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	FABRICATED CUT LENGTH = 1.350"
10	CB108	DOOR-CORNER BLOCK	2.130 X 1.54 X 0.250	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	FABRICATED CUT LENGTH = 5.553"
11	CB109	DOOR CORNER BLOCK	1.540 X 7.513 X .250	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	FABRICATED CUT LENGTH = 7.513"
12	CS501-1	GLASS STOP CLIP	0.769 X 0.178 X 1.250 X 0.068	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	USED WITH (20)
13	D101	DOOR TOP RAIL	1.710 X 2.250 X 0.120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
14	D103	HINGE STILE	1.750 X 2.125 X 0.120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
15	D104	DOOR INACTIVE MEETING STILE	1.750 X 2.125 X 0.120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
16	D105	DOOR ACTIVE MEETING STILE	1.750 X 1.989 X 0.120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
17	D106	DOOR- ADJUSTABLE ASTRAGAL	1.562 X 0.331 X 0.062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
18	D108	DOOR-BOTTOM RAIL	7.5 X 1.710 X 0.120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
19	D109	DOOR- BOTTOM RAIL	1.710 X 9.500 X 0.120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
20	DG501	DOOR - GLASS STOP - ATTACHED	1 X 0.539 X 0.065	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
21	DG502	DOOR - GLASS STOP - SNAP-IN	0.876 X 0.539 X 0.065	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
22	DP200-1	PANIC DOOR STOP AT PAIRS	1.323 X 0.402 X 0.188	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	2" LONG: LOCATE AT CENTER
23	DS500	DOOR STOP	1.260 X 0.648 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
24	FL504	STD. VERTICAL MULLION OR DOOR JAMB	5 X 2.500 X 0.094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
25	FL507	DOOR HEADER	4.980 X 2.500 X 0.080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
26	FL515	FLAT FILLER AT DOOR JAMB	4.670 X 0.681 X 0.080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	RUNS FULL LENGTH OF DOOR JAMB AT WALL (24)
27	SP100	ADJUSTABLE ASTRAGAL SPRING	1.055 X 0.485 X 0.055	S. STEEL	CORAL INDUSTRIES, INC.	
28	TH4	THRESHOLD	4 X 0.500 X 0.125	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
29	TH403	THRESHOLD CLIP	1.390 X 1.909 X 0.126	STEEL	VARIES	
30	WP106	WEATHERING- (17) ADJUSTABLE ASTRAGAL	VARIABLE SPACE	WOOL PILE	VARIES	DOUBLE ROW- FULL LENGTH OF ASTRAGAL (17)
31	WS100	DOOR RAIL SWEEP	0.302 X 0.812 X 35.125	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
32	VG1	WEATHERING FOR (31)	0.120 X 1.142 X 0.060	SOFT VINYL	CORAL INDUSTRIES, INC.	CUT TO DOOR OPENING WIDTH (LESS CLEARANCE)
33	AS1	FASTENER	#10 X 3/4" FHP	STEEL	VARIES	
34	AS4	CAP BOLT	3/8"-16 X 1" HWH	STEEL	VARIES	
35	AS7	FASTENER	#8 X 3/4" POH S.D.	STEEL	VARIES	ATTACH (17) TO (16)
36	AS13	SQUARE NUT	1.475 X 1.475 X .180	ZINC PLATED STEEL	CORAL INDUSTRIES, INC.	
37	AS18	FASTENER	#10 X 1-1/4" FHP	S. STEEL	VARIES	ATTACH (23) TO (24)
38	AS20	FASTENER	#10-16 X 1/2" FHP	STEEL	VARIES	ATTACH (22) TO (28)
39	AS39	FASTENER	#10 X 1-3/4" FHP S.D.	S. STEEL	VARIES	
40	AS41	3/8" REGULAR LOCK WASHER	0.377 X 0.141 X 0.094	STEEL	VARIES	

Hurricane Test Laboratory

HTL

Tested unless Otherwise Noted

Date 5/4/07

Job # 0402-0304-07

REV	DATE	BY	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR SERIES 281 HURRICANE IMPACT-RESISTANT DOORS IN FL500 FRAMING

BILL OF MATERIALS

DATE 4/18/2007

DRAWN	CHECKED	APPROVED
MLL	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 281_01

BUTT HINGE HARDWARE SCHEDULES

HTL TEST					DOOR MARK	DOOR: #TYPICAL		ELEV: E21 & E22
					DOOR SIZE	72" X 84" PAIR		
		DOOR HINGING			LOCKING DEVICE		SERIES	NOTES:
DOOR TYPE		B.H.	C.G.H.	O.P.	DH067	X		3 POINT LOCK
SERIES 281		x	▼	▼	EXIT DEVICES:		SERIES	NOTES:
						—		
						—		
						—		
						—		
						—		
						—		

HARDWARE DESCRIPTION	PART NUMBER	QTY	MANUFACTURER	USED
CLOSER - SURFACE MOUNTED	VARIES	0	VARIES	▼
BUTT HINGE 4 1/2" X 4"	DH109	6	HAGER	X
PULL HANDLE	PH1-10	2	CORAL	X
PUSH BAR	PB1-33	2	CORAL	X
CYLINDER (ACTIVE)	DH078 (PAIR)	1	CORAL	X
THUMB TURN (ACTIVE) OPTIONAL	DH079	0	CORAL	▼
LOCK (ACTIVE) HOOK BOLT	DH067 3- POINT LOCK	1	INTERNATIONAL	X
LOCK INDICATOR (ACTIVE) OPTIONAL	DH074	0	INTERNATIONAL	▼
FLUSH BOLT - STL. TIP (INACTIVE)	DH176	2	VARIES	X
PANIC STOP	DP200-1	1	CORAL	X
THRESHOLD	TH4	1	CORAL	X
DOOR BOTTOM SWEEP	WS36	2	CORAL	X
OPTIONAL HINGE:				
CONTINUOUS GEAR HINGE	DH111-83	0	VARIES	▼

NOTES:

C.V.R. = CONCEALED VERTICAL ROD

X = APPLIES
▼ = NOT APPLICABLE

HTL TEST					DOOR MARK	DOOR: # TYPICAL		ELEV: E23
IMPACT	X	NOA			DOOR SIZE	72" X 84" PAIR		
		DOOR HINGING			LOCKING DEVICE		MANUFACTURER	NOTES:
DOOR TYPE		B.H.	C.G.H.	O.P.	DH072-96	▼	VARIES	3 POINT LOCK
SERIES 281		X	▼	▼	EXIT DEVICES:		SERIES	NOTES:
					JACKSON	X	2086	CVR PANIC

HARDWARE DESCRIPTION	PART NUMBER	QTY	MANUFACTURER	USED
CLOSER - SURFACE MOUNTED	VARIES	0	VARIES	▼
CLOSER - CONCEALED OVERHEAD	CL205 H.D. W/ O. A. ASS'Y	0	JACKSON	▼
BUTT HINGE 4 1/2" X 4"	DH109	6	HAGER	X
PULL HANDLE	PH401	2	CORAL	X
PUSH BAR	DH3242	0	CORAL	▼
CYLINDER (ACTIVE)	DH078	1	CORAL	X
THUMB TURN (ACTIVE) OPTIONAL	DH079	0	VARIES	▼
CYLINDER (ACTIVE) FOR VON DUPRIN EXIT	DH081 (RIM CYLINDER)	0	VARIES	▼
LOCK (ACTIVE)	DH072-96 (3 PT. LOCK)	0	VARIES	▼
LOCK INDICATOR (ACTIVE) OPTIONAL	DH074	0	VARIES	▼
FLUSH BOLT (INACTIVE)TOP/BTM 84" DOOR	DH176	0	VARIES	▼
FLUSH BOLT (INACTIVE)TOP ONLY 96" DOOR	DH176-96	0	VARIES	▼
PANIC STOP	DP200-2	1	CORAL	X
THRESHOLD	TH4	1	CORAL	X
DOOR BOTTOM SWEEP	WS142	2	CORAL	X

NOTES:

C.V.R. = CONCEALED VERTICAL ROD

X= APPLIES
▼=NOT APPLICABLE

Hurricane Test Laboratory

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Date 5/2/07

Job # 07-0402-0304-07

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REV	BY	DATE	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR SERIES
281 HURRICANE IMPACT-RESISTANT
DOORS IN FL500 FRAMING

HARDWARE SCHEDULES

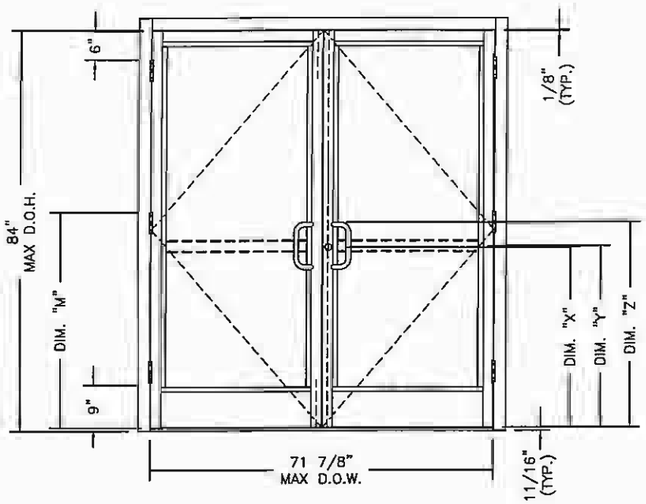
DATE 4/18/2007

DRAWN	CHECKED	APPROVED
MLL	JDW	JDW

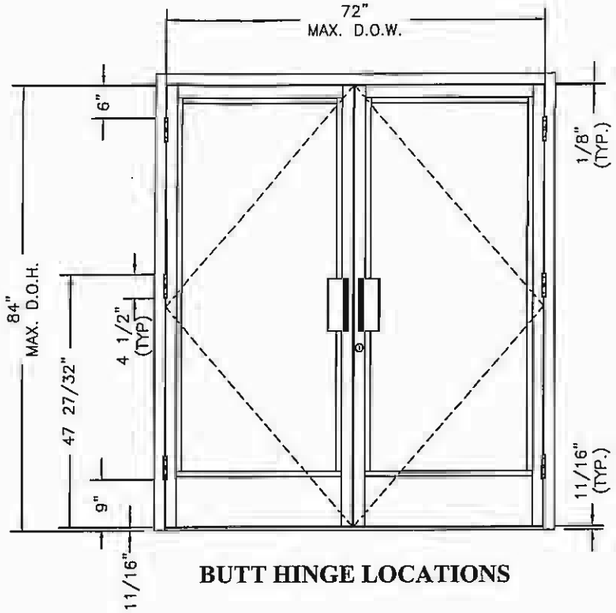
PROJECT NO. HTL TEST

DRAWING NO. 281_01

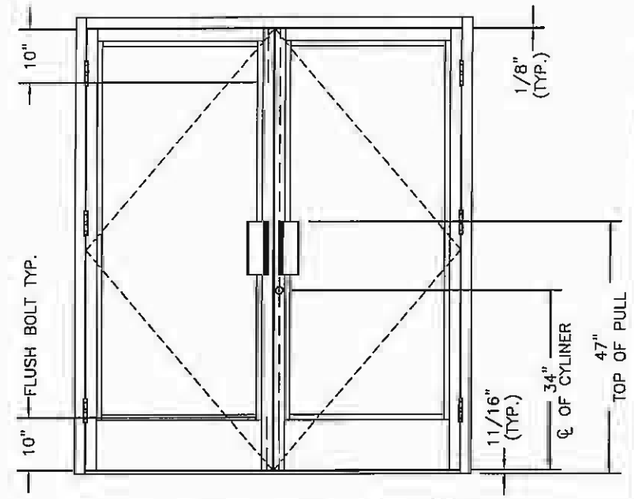
STANDARD HARDWARE LOCATIONS
FOR SERIES 281 ENTRANCE DOORS
WITH 1-1/2 PAIR BUTT HINGES



INTERMEDIATE HINGE LOCATION	
D.O. HEIGHT	DIM. "M" BUTT HUNG
84"	45–11/32"



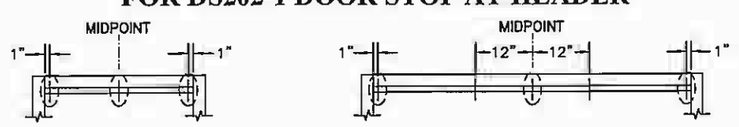
BUTT HINGE LOCATIONS



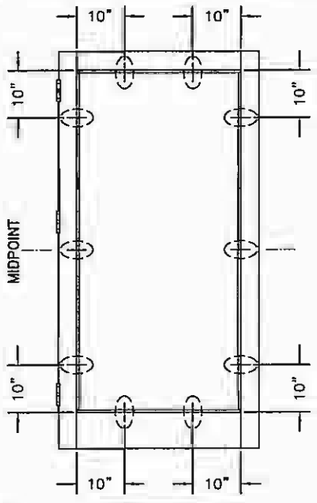
3-POINT LOCK AND FLUSH BOLT LOCATIONS

HDW LOCATIONS FOR PANIC DOORS				
MANUFACTURER	PANIC DEVICE	DIM "X" ℄ OF CYLINDER	DIM "Y" ℄ OF PANIC	DIM "Z" TOP OF PULL
JACKSON	2086 H.R.–C.V.R.	37 7/8"	38 5/32"	42 7/8"

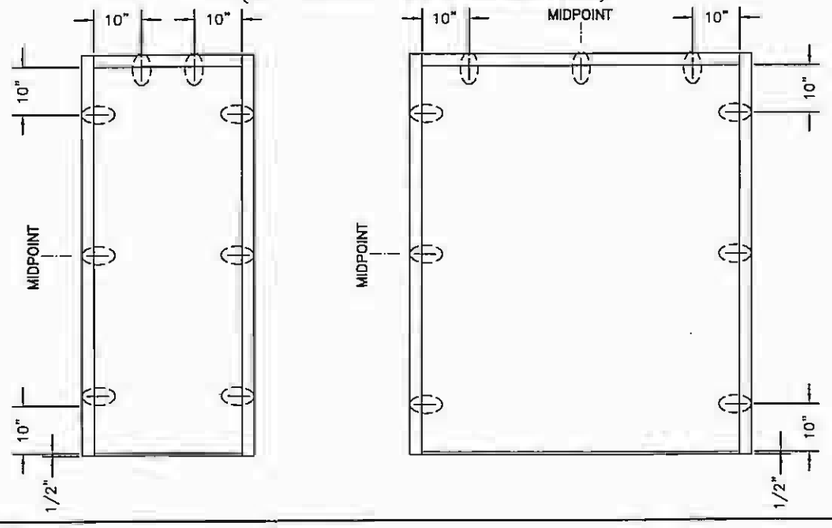
ATTACHMENT LOCATIONS
FOR DS202-1 DOOR STOP AT HEADER



ATTACHMENT LOCATIONS
FOR CS501-1 GLASS STOP CLIP
(84" OR 96" DOOR HEIGHT)



ATTACHMENT LOCATIONS
FOR DS500-1 DOOR STOP
(84" OR 96" DOOR HEIGHT)



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Date 5/2/07
Job # G-402-030607

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REV	BY	DATE	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR SERIES
281 HURRICANE IMPACT-RESISTANT
DOORS IN FL500 FRAMING

HARDWARE LOCATIONS

DATE 4/18/2007

DRAWN	CHECKED	APPROVED
MLL	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 281_01

SHEET 12 OF 12