HURRICANE TEST LABORATORY, LLC

Testing & Evaluation Solutions

CORAL ARCHITECTURAL PRODCUTS

"Series 381 Doors"

HTL Report # G402-0305-07

May 2, 2007

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

Re: HTL Test Report #G402-0305-07

Dear Mr. Williams;

Enclosed you will find the test report package for the Series 381 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 # G402-0305-07 for Specimen # E1, E2, and E3
- 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

561.881.0020

Fax 561.881.0075

GEORGIA OFFICE

1701 Westfork Drive, Suite 106

Lithia Springs, GA 30122

770.941.6916

Fax 770.941.2930

www.htltest.com

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 (HTLGA07008)

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
G402-0305-07	E1	X	X	X		X	X
	E2	X	X	X		X	X
	E3	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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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: JD Williams

3.0 HTL TEST NOTIFICATION #: HTLGA07008

4.0 HTL LAB CERTIFICATION: Miami-Dade County (04-0806.02)
Florida Building Code #TST3892
IAS #TL-388

PRODUCT IDENTIFICATION

5.0 Product Types: Medium Stile Doors with 3-point lock.

6.0 Model Number: CORAL FL500 Window Wall System with Series 381 MS Out-swing Doors

7.0 Performance Class: +70/-80

8.0 Overall Size: 149" (w) x 120-3/8" (h)

9.0 Door Panel Sizes: Two panels, each panel is 42" (w) x 96" (h).

10.0 Configuration: This sample consisted of **two** individual frames that were each assembled separately and snapped together to form an overall frame that was **two** bays wide –The left bay had two operable doors. See Drawing #381_01, Sheet 2 of 18 for an elevation of this sample. Each of the bays in this sample was configured as follows:

Location	# Of Fixed Glass Lites	Glass Type	ProductType
Left Bay (Lower)	N/A	B	Series 381 Doors
Left Bay (Upper)	1	A	FL500
Right Bay (Upper)	1	U	FL500
Right Bay (Lower)	1	A	FL500

NOTE: The individual frame located in the left bay consisted of two vertical members, a head member, an intermediate horizontal member (transom bar) and a sill member (threshold). The individual frame located in the right bay consisted of two vertical members (FL505 filler and FL501 wall jamb), a head member, a sill member and an intermediate horizontal member.

11.0 Drawing: This test report is incomplete without the attached Coral Drawing "381_01" bearing the raised seal of Hurricane Test Laboratory, LLC.

PRODUCT DESCRIPTION

12.0 Frame Construction:

12.1 Left Bay Individual Frame Assembly: The individual frame located in the left bay was fabricated using some or all of the following aluminum extrusions:

Description	Part #	Overall Cross Section	Material
Frame Head	FL501	2.500" x 5.000" x.094"	6063-T6
Threshold	TH4	0.500" x 4.000" x 0.125"	6063-T6

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Description	Part #	Overall Cross Section	Material
Transom Bar/Door Header (E1)	FL507	2.500" x 4.980" x 0.080"	6063-T6
Transom Bar for COC (E2)	FL512	2.000" x 5.000" x 0.125	6063-T6
Mullion	FL504	5.000" x 2.500" x 0.094"	6063-T6
Door Stop for COC/OA (E2)	DS202	1.188" x2.000" x 0.090"	6063-T6
Flat Filler for Door Jamb @ Wall	FL515	0.681" x 4.670" x 0.080"	6063-T6
Door Stop	DS500-1	0.648" x 1.260" x 0.094"	6063-T6
Transom Sash	FL517	1.000" x 1.918" x 0.062"	6063-T6
Transom Sash Glass Stop	FL518	1.000" x 0.767" x 0.062"	6063-T6
Steel Reinforcement	SR504	4.562" x 1.250" x 0.250"	A36

Note: See Drawing # 381_01 Sheet 2 for an overall elevation of this sample.

The following procedures (typical) were utilized when assembling this individual frame:
Frame Corner Construction: At each top corner, the frame jamb (Part # FL504) ran through while the frame head (Part # FL501) and transom bar/ door header (Part # FL507) horizontal members were square cut, butted, and mechanically fastened to each frame jamb using #14 x 1" HH STS fasteners that passed through the verticals and threaded into the horizontal member's screw splines. At each bottom corner, the frame jamb ran through while the threshold (Part # TH4) was square cut, butted and mechanically fastened to the frame jamb using two (2) 1.900" x 1.999" x 0.126" zinc plated steel clips (Coral Part # TH403) and four (4) #10-24 x 3/8" FHPUC screws. See drawing #381_01, Sheet 11 of 18 for an exploded view of this assembly. NOTE: After this individual frame was assembled and prior to the installation of this frame, a continuous flat-filler plate (FL515) was snapped into the jamb mullion on the left and steel reinforcement (Part # SR504) was installed and mechanical attached to the jamb mullion on the right. The steel reinforcement was mechanically attached using two #10-24 x 3/8" HH STS located 1-1/2" from each end of the jamb mullion. See Drawing # 381_01 Sheet 8, Details 9 and 10.
Door Stop Attachment: The first step prior to installing the doorstop (Part # DS500-1) was to anchor the left jamb mullion to the substrate with eight (8), 3/8" x 3-1/2" grade 2 bolts with nuts and washers at the locations shown on Drawing 381_01 Sheet 3. The second step was to mechanically attach each continuous head stop (Part # DS500-1) with three (3) #10 x 1-3/4" FHP TEK screws located at midpoint and 10" from each end. The third step was to mechanically attach each jamb stop with three (3) #10 x 1-1/4" located at midpoint and 10" from each end. See 381_01 Sheet 18 for more information.
Transom Glazing Pocket Assembly: A continuous fixed transom sash (Part # FL517) was attached to the frame jambs extending above the door header at midpoint with one (1) #10 x 1-1/4" FHP TEK. NOTE: The joint between each fixed glass stop end and the window wall framing was sealed with a bead of Dow Corning 795 silicone sealant. A continuous removable transom sash glass stop (FL518) was snap-applied to each frame jamb on the exterior side of the transom.
Frame Joint Sealant: Each head member/mullion joint and each door header/mullion joint was sealed using strips of Schnee-Morehead SM5610 TackyTape ® Industrial Tape Sealant. See Drawing #381_01,Sheets 6 and 9, Details 1 and 11, for more information on the tape sealant. Each threshold/mullion joint was sealed with a bead of Dow Corning 795 silicone sealant. See Drawing 381_01, Sheet 9,Detail 12, for the placement of this sealant.

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12.2 Right Bay Individual Frame Assembly: The individual frame located in the right bay of this sample was fabricated from some are all of the following aluminum extrusions:

Description	Part #	Overall Cross Section	Alloy
Frame Head/Wall Jamb	FL501	2.500" x 5.000" x 0.094"	6063-T6
Intermediate Horizontal Mullion	FL506	2.500" x 4.980" x 0.080"	6063-T6
Glass Stop-Horizontal/Sill	FL503	1.250" x 2.021" x 0.078"	6063-T6
Mullion Filler with Glazing Pocket	FL505	0.681" x 4.670" x 0.080"	6063-T6
Fame Sill/Head	FL502	2.500" x 4.980" x 0.080"	6063-T6
Sill Flashing	FL519	2.620" x 5.402" x 0.084"	6063-T6

The following procedures (typical) were utilized when assembling each individual frame:
Frame Corner Construction: At each frame corner, the vertical frame member ran through while the horizontal frame member was square cut, butted, and mechanically fastened to the vertical frame member using #14 x 1" HH STS fasteners that passed through the vertical and threaded into the horizontal member's screw splines. See Drawing #381_01, Sheets 6, 9 & 10 Details 1, 2, 2A, 3 and 11 for the number of fasteners for each joint intersection. NOTE: This same construction method was utilized in the attachment of the intermediate horizontal to each vertical frame member. NOTE: A continuous snap-in flat filler plate (FL515) was inserted into the left jamb mullion prior it's installation into the opening. The glass stop (Part# FL503) used at the sill/head and/or intermediate horizontal location was cut D.L.O. less 1/16" and hooked into the window wall framing.
Frame Joint Sealant: Each frame joint was sealed using strips of Schnee-Morehead SM5610 TackyTape ® Industrial Tape Sealant. See Drawing #381_01, Sheets 6 & 9 of 18, Details 1, 2, 2A and 3 for the location of the tape sealant.

12.3 Overall Frame Assembly: Step one in the assembly of the overall sample was to install the entrance frame on the left and secure it to the opening. Step two is to install the end dam (ED519) to the right end of continuous sill flashing (FL519). Step three is to install the sill flashing the full width of the right frame opening. Note: The sill flashing abuts against the intermediate frame jamb. See 381_01 Sheet 8, Detail 9 for more information on this intersection. NOTE: All heads of the fasteners used to attach the sill flashing to the opening were cap sealed with Dow Corning 995 Structural Silicone sealant. Prior to installing the right frame, a continuous bead of Dow 995 Structural Silicone sealant is applied into the "C" slot receiver on the upright interior leg of the (Part # FL519) sill flashing. See 381_01 Sheet 6, Detail 3. Step four is to stack the individual frame for the right bay onto to the sill flashing, snap it into the left jamb mullion and secured it to the opening with structural fasteners. See Drawing 381_01 Sheet 3 for location and type fasteners. Finally, the entire perimeter of the framing was sealed on the exterior and interior with Dow Corning 795 sealant. This bead sealed the ends of the vertical mullions to the opening and also sealed the under-surface of the threshold to the substrate. See Drawing #381_01 for the placement of this sealant for the referenced details.

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12.4 Overall Frame Mullion Reinforcement: The intermediate mullion in the sample was reinforced as follows:

Qty.	Location	Description
Qty.	**Location**	**Description**
1	Intermediate Mullion.	Each intermediate mullion was reinforced with one (1), 119" long piece of ¼" steel reinforcement with overall cross-sectional dimensions of 4-9/16" x 1-1/4" (Part # SR504). Each piece of steel reinforcement was secured in place using one (1), #10-24 x 3/8" STS HH bolt located 3/4" away from each end of the steel reinforcement. See Drawing #381_01, Sheet 7, Detail 4

13.0 Door Construction: Each of the door panels was fabricated using all or some of the following aluminum extrusions.

Description	Part #	Overall Cross Section	Alloy
Top Rail	D102	4.000" x1.710" x 0.120"	6063-T6
Bottom Rail (E1)	D108	7.500" x 1.710" " 0.120"	6063-T6
Bottom Rail	D109	9.500" x 1.710" " 0.120"	6063-T6
Active Lock Stile	D112	3.614" x 1.750" x 0.120"	6063-T6
Inactive Leaf Lock Stile	D111	3.750" x 1.750" x 0.120"	6063-T6
Hinge Stiles	D110	3.750" x 1.750" x 0.120"	6063-T6
Adjustable Astragal	D106	0.331" x 1.562" x 0.062"	6063-T6
Top Corner Block	CB102	2.130" x 1.540" x 0.250"	6063-T6
Bottom Corner Block (E1)	CB108	2.130" x 1.540" x 0.250"	6063-T6
Bottom Corner Block	CB109	2.130" x 1.540" x 0.250"	6063-T6
Glass Stop (Applied)	DS501	1.000" x 0.5390" 0.125"	6063-T6
Glass Stop (Snap-in)	DS502	0.876" x 0.539" x 0.065"	6063-T6

The following construction procedures (typical) were utilized in the assembly of the door panel:
Door Panel Top Corner Construction: At each door corner, both rail ends were square cut, butted, and attached together using door corner block (Part# CB102 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.
Door Panel Bottom Corner Construction: 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. See Drawing 381_01 Sheet 10 for exploded view details of the door corner construction.
Door Panel Corner Sealant: None used.
Miscellaneous Construction: A continuous aluminum sweep (Part # WS142) is applied along the bottom edge of 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

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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. Note: 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 frame using DG502 glass stop on the exterior side and DG501 on the interior. DG501 is secured to the door stiles and rails using three (3) #8 x 3/4" POH-TEK screws and three (3) (Part # CS501-1) aluminum clips at midpoint and 10" from each end. For the top and bottom rails, each DG501 is attached with two (2) #8 x 3/4" POH-TEK screws and two (2) CS501-1 aluminum clips located 10" from each end. DG502 snap fits to the interior door stiles and rails. See Drawing 381_01 Sheet 18 for more information. on the attachment locations.

14.0 Glazing:

14.1 Glazing Material: There were three differenet glazing materials used in this sample:

Glass Type A: 9/16" thick laminated glass with the following components:
- 0.25" HS
- 0.075" Solutia VS02 Interlayer (Miami Dade NOA #03-0514.15)
- 0.25" HS

Glass Type B: 9/16" thick laminated glass with the following components:
- 0.25" HS
- 0.090" Solutia Saflex PVB Interlayer (Miami Dade NOA #03-0205.02)
- 0.25" HS

Glass Type U: 9/16" thick laminated glass with the following components:
- 0.25" HS
- 0.120" Uvekol Type "S" Interlayer (Miami Dade NOA #03-1117.05)
- 0.25" HS

NOTE: The specific make up for the laminated-glass listed above was provided to HTL by CORAL. Only the manufacturer and the overall thickness of each laminate have been verified by HTL.

14.2 Window Wall Glazing Method: Each glass lite used in the window-wall portion of this sample was glazed using the following (typical) procedures:
Interior Side: Using continuous strips of an extruded EPDM interior spacer gasket (Part #NG14) and Dow Corning 995 structural silicone sealant..
Exterior Side: Using continuous strips of an extruded EPDM exterior glazing gasket (Part #NG1). Each corner of the gasket is sealed using a 2" long cap bead of Dow Corning 795 Structural Silicone Sealant in both directions of the gasket.

14.3 Door Panel Glazing Method: Each glass lite used in each door panel 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.

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14.4 Daylight Opening:

Qty.	Location	Daylight Opening	Glass Bite	Glass Type
1	Door Panel.	32-5/16" x 81-11/16"	¾"	B
1	Door Panel.	32-5/16" x 81-11/16"	¾"	U
1	Door Transom.	82" x 19- 3/8"	9/16"	A
1	Right bay, bottom row.	57-1/2" x 96"	9/16"	A
1	Right bay, top row.	57-1/2" x 16-1/2"	9/16"	U

15.0 Weather-stripping:

Qty.	Location	Description
22 lf.	Laced into door stop (Part #DS500-1) used at header and jambs.	EPDM bulb gasket (Part # NG5)
16-lf	Two (2) rows along adjustable astragal	Schlegel wool pile weather-strip (Part #WP106)
7-lf	3.5-lf per door panel inserted into door sweep.	Soft Vinyl door sweep gasket (Part # VG1).

16.0 Hardware:

ACTIVE DOOR PANEL		
Qty.	**Location**	**Description**
1	Active panel meeting stile. Lock main body is located 30-11/16" above the bottom edge of door panel.	Three Point Hook Bolt Lock (Part # DH072-96)
2	Active panel meeting stile, Lock Cylinder is located 34" above bottom edge of door panel on exterior & interior.	Lock Cylinder (Part #DH078). See Drawing #381_01, 18, for information regarding the proper installation of the lock cylinder.
1	Active panel meeting stile, top of handle is located 47" above bottom edge of door panel on exterior.	Pull Handle (Part # PH10). This pull handle is attached to the meeting stile using two (2), ¼"-20 x 3/4" FHP fasteners.
1	Active panel hinge & lock stiles, from bottom edge of door panel to centerline is 37-1/2"	Push Bar (Part # DH3242). This push bar is attached to each stile using one (1), ¼"-20 x 1-1/2" FHP and one (1) ¼"-20 x ¾" FHP fasteners.

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ACTIVE DOOR PANEL		
Qty.	**Location**	**Description**
3	Inactive, 6" from the top edge, and 51-11/32" and 9 above the bottom edge of the door panel.	4-1/2" x 4" Butt Hinge (Part #DH109). NOTE: Each hinge featured ball bearings and a stainless steel pin. Each hinge is attached to the door stile and the doorframe using four (4), #12-24 x ½" FH MS that passed through the stile member and threaded into a 10-gauge zinc plated steel back-up plate. See Drawing 381_01 Sheet 11 for more information.
1	Bottom of door	Coral Bottom Sweep (Part # WS142)

IN-ACTIVE DOOR PANEL		
Qty.	**Location**	**Description**
2	Inactive panel meeting stile located 22" below top edge of door panel and 10" above bottom edge of door panel.	Flushbolts (Part # DH17696 @ top & DH176 @ bottom) with ¼-20 threaded rods and threaded steel tips.
1	Inactive panel meeting stile, top of handle is located 47" above bottom edge of door panel.	Pull Handle (Part # PH10). This pull handle is attached to the meeting stile using two (2), ¼"-20 x 3/4" FHP fasteners.
1	Active panel hinge & lock stiles, from bottom edge of door panel to centerline is 37-1/2"	Push Bar (Part # DH3242). This push bar is attached to each stile using one (1), ¼"-20 x 1-1/2" FHP and one (1) ¼"-20 x ¾" FHP fasteners.
3	Inactive, 6" from the top edge, and 51-11/32" and 9 above the bottom edge of the door panel.	4-1/2" x 4" Butt Hinge (Part #DH109). NOTE: Each hinge featured ball bearings and a stainless steel pin. Each hinge is attached to the door stile and the doorframe using four (4), #12-24 x ½" FH MS that passed through the stile member and threaded into a 10-gauge zinc plated steel back-up plate. See Drawing 381_01 Sheet 11 for more information.
1	Bottom of door	Coral Bottom Sweep (Part # WS142)

17.0 Weep Holes: N/A
18.0 Muntins: None used.
19.0 Additional Reinforcement: None used.
20.0 Sealant's Used:

Location	***Sealant***
Perimeter Sealant	Dow Corning 795 Structural Silicone Sealant
Structural Glazing Sealant	Dow Corning 995 Structural Silicone Sealant
Frame Joint Sealant.	Schnee-Morehead SM5610 TackyTape® Industrial Tape Sealant.

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INSTALLATION

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

Location	*Anchor Description & Schedule*
Frame Head @ Right and Left Bay	The member on the left was attached to the steel opening using four (4), 3/8" x 1-1/2" HWH TCS Screws. These fasteners were 21-1/2", 63-1/4", 80" and 82" from the left end of the panel head member. The member on the right was attached with four (4) 3/8" x 1-1/2" HWH STS located in groups of two adjacent to each mullion and were spaced 2" and 4" away from each mullion.
Frame Sill @ Right Bay	Attached to the steel opening using four (4), 3/8" 1-1/2" HWH TCS Screws located in groups of two adjacent to each mullion and were spaced 2" and 4" away from the ends of each mullion. See Drawing #381_01, Sheet 6, Detail 3 for more information.
Threshold Clip	Each threshold clip was attached to the frame jambs using two (2), #10- 24 x 3/8" FHPUC screws See Drawing #381_01, Sheet 11 for exploded view.
Threshold	The threshold was additionally secured to the steel opening using a single row of eight (8) #12"x 1-1/2" TEK Screws with four (4) located 2", 5", 8" and 11" from the left end with two (2) additional fasteners spaced 2" on each side of the geometric centerline.
Sill Flashing @ Right Bay	The sill flashing was attached to the steel opening using three (3) #12 x 1" FHP TEK non-structural screws spaced 24" from each end and at mid-point. See Drawing #381_01, Sheet 6, Detail 3 for more information.
Left Jamb @ Wall	Attached with a single row of eight (8) 3/8" x 3-1/2" grade 2 bolts with nuts and washers located 5" from the top end and 2-3/8", 45", 51", 88", 94", 100" and 106" from the bottom end.
Right Jamb @ Wall	Attached with two (2) 3/8" x 1-1/2" TEK Screws Located at 2" above and below midpoint of span.

TEST RESULTS

22.0 SUMMARY OF RESULTS

Test Method	Test Conditions	Test Conclusion
Air Infiltration Test (ASTM E283 and TAS 202)	1.57 psf & 6.24 psf	PASS
Uniform Static Load Test (ASTM E330 and TAS 202)	+ 70 and – 80 psf Design Pressure	PASS
Forced Entry Resistance Test (TAS 202 [SFBC 3603.2 (b) 5])	300-lb.	PASS

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Test Method	Test Conditions	Test Conclusion
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)	+ 70 and – 80 psf Design Pressure	PASS

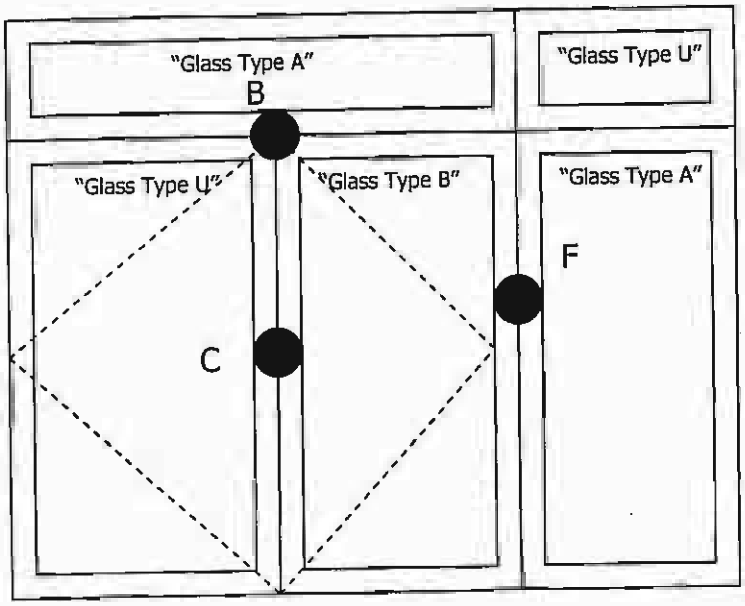
23.0 TEST RESULTS:

23.1 AIR INFILTRATION TEST RESULTS:

Test Pressure	Measured	Allowed
1.57 psf	0.16 cfm/ft^2	0.50 cfm/ft^2
6.24 psf	0.52 cfm/ft^2	N/A

23.2 UNIFORM STATIC LOAD TEST RESULTS:

23.2.1 LOCATION OF DEFLECTION MEASUREMENTS:



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23.2.2 PERMANENT SET DATA:

POSITIVE LOAD:

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.00	0.17
+ 70.00	0.00	0.17
+ 105.00	0.01	0.17

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.01	0.38
+ 70.00	0.07	0.38
+ 105.00	0.17	0.38

LOCATION F		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.00	0.24
+ 70.00	0.00	0.24
+ 105.00	0.05	0.24

NEGATIVE LOAD:

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.01	0.17
- 80.00	0.03	0.17
- 120.00	0.09	0.17

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LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.07	0.38
- 80.00	0.12	0.38
- 120.00	0.29	0.38

LOCATION F		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.05	0.24
- 80.00	0.08	0.24
- 120.00	0.13	0.24

23.2.3 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.

23.3 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.

23.4 LARGE MISSILE IMPACT TEST
Missile Length: *96"*
Missile Weight: *9-lb. 2-oz.*

Impact #	Velocity (ft/s)	Glass Temperature (°F)	X Coordinate (in.)	Y Coordinate (in.)
1	50.00	79.50	25.50	52.00
2	49.16	79.50	30.00	19.00
3	49.12	81.00	46.00	109.00
4	49.31	81.00	76.00	105.00
5	50.63	N/A	44.00	48.00
6	50.10	N/A	64.50	6.00
7	50.71	N/A	88.00	60.00
8	50.15	N/A	47.50	97.00

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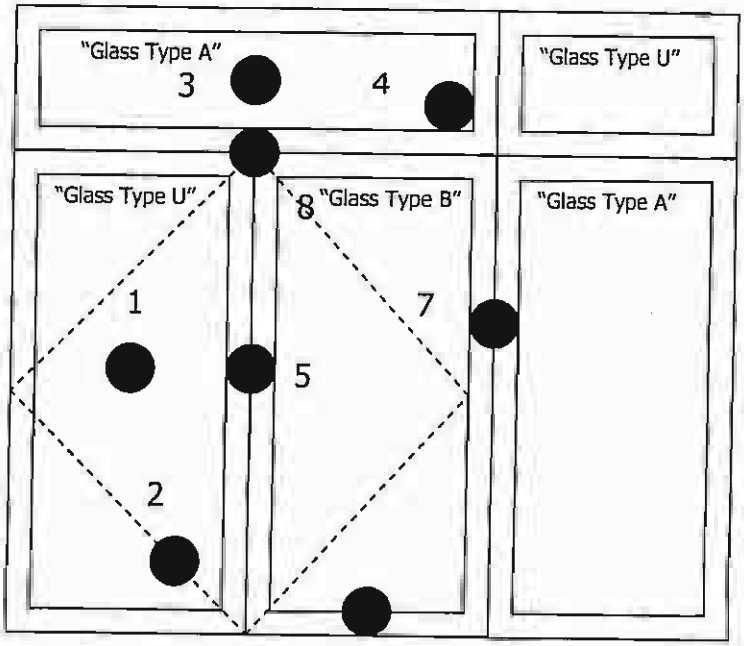
23.4.1 IMPACT LOCATIONS AND REMARKS:

Impact #'s 1 - 8 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.



23.5 CYCLIC LOAD TEST

23.5.1 TEST PARAMETERS:

Positive Design Load	70 psf
Negative Design Load	80 psf

23.5.2 TEST SPECTRUM:

Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
14 – 35 (psf)	**0 – 42 (psf)**	**35 – 56 (psf)**	**21 – 70 (psf)**
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
24 – 80 (psf)	**40 – 64 (psf)**	**0 – 48 (psf)**	**16 – 40 (psf)**
50	1050	50	3350

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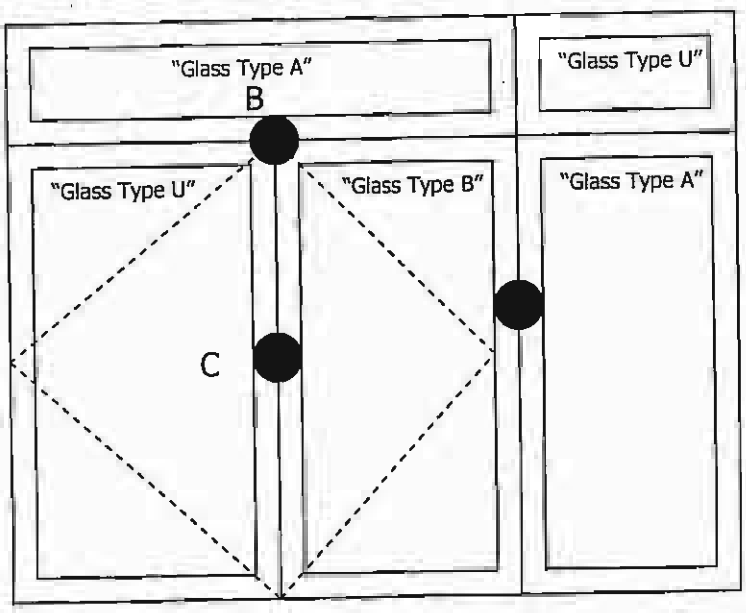
23.5.3 DEFLECTION GAGE LOCATIONS:



23.6 PERMANENT 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.)**
B	0.13	0.17	0.08	0.17
C	0.25	0.38	0.18	0.38
F	0.13	0.24	0.18	0.24

23.7 REMARKS:

This sample was 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.

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MISCELLANEOUS INFORMATION

24.0 CERTIFICATION & DISCLAIMER STATEMENT:

All tests performed on this test specimen were witnessed 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, in Lithia Springs, Georgia. 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.

25.0 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 E331 – Standard Test Method for Water Penetration 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.

26.0 LIST OF OFFICIAL OBSERVERS (All or Partial):

Vinu J. Abraham – HTL, Professional Engineer
José E. Colón, E.I. – HTL, Operations Manager
Andrew Bush - HTL
Ian J. Mckenzie – HTL
JD Wiliams - Coral

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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, AL 35406

2.0 CONTACT PERSON: JD Williams

3.0 HTL TEST NOTIFICATION #: HTLGA07008(Miami-Dade)

4.0 HTL LAB CERTIFICATION: Miami-Dade County (04-0806.02)
Florida Building Code #TST3892
IAS #TL-388

PRODUCT IDENTIFICATION

5.0 Product Types: Stile Doors with Jackson 2086 concealed exit device, COC with offset arm assembly.

6.0 Model Number: CORAL FL500 Window Wall System with Series 381 MS Out-swing Doors

7.0 Performance Class: +70/-80

8.0 Overall Size: 89" (w) x 120" (h)

9.0 Door Panel Sizes: Two panels, each panel is 42" (w) x 96" (h).

10.0 Configuration: Operable pair of doors with overhead concealed closer with offset arm assembly in a frame with transom.

11.0 Drawing: This test report is incomplete without the attached Coral Drawing "381_01" (Sheets 1-18) bearing the raised seal of Hurricane Test Laboratory, LLC.

PRODUCT DESCRIPTION

12.0 Frame Construction: The frame was fabricated using some or all of the following aluminum extrusions:

Description	Part #	Overall Cross Section	Material
Frame Head	FL501	2.500" x 5.000" x.094"	6063-T6
Threshold	TH4	0.500" x 4.000" x 0.125"	6063-T6
Transom Bar (Door Header)	FL507	2.500" x 4.980" x 0.080"	6063-T6
Transom Bar for COC (E2)	FL512	2.000" x 5.000" x 0.125	6063-T6
Mullion/Door Jamb	FL504	5.000" x 2.500" x 0.094"	6063-T6
Door Stop for COC/OA (E2)	DS202	1.188" x2.000" x 0.090"	6063-T6
Flat Filler for Door Jamb @ Wall	FL515	0.681" x 4.670" x 0.080"	6063-T6
Door Stop	DS500-1	0.648" x 1.260" x 0.094"	6063-T6
Transom Sash	FL517	1.000" x 1.918" x 0.062"	6063-T6
Transom Sash Glass Stop	FL518	1.000" x 0.767" x 0.062"	6063-T6
Steel Reinforcement	SR504	4.562" x 1.250" x 0.250"	A36

NOTE: See Drawing #381_01, Sheet 4 for an overall elevation of this sample.

The following procedures (typical) were utilized when assembling this individual frame:
Frame Corner Construction: At each top corner, the frame jamb (Part # FL504) ran through while the frame head (Part # FL501) was square cut, butted, and mechanically fastened to each frame jamb using #14 x 1" HH STS fasteners that passed through the vertical and threaded into the horizontal members screw splines. At the transom bar/door header, (Part # FL512) was square cut, butted, and mechanically

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fastened to each frame jamb using two mounting clips (Part # HC100) attached to the frame jamb using two (2) #12 x 1" HWH #3 TEK screws. The transom bar/door header (Part # FL512) slides over the mounting clips and is attached on the topside with two (2) # 10-32 x ¾" fasteners on each end. At each bottom corner, the frame jamb (Part # FL504) ran through while the threshold (Part # TH4) was square cut, butted and mechanically fastened to the frame jamb using two (2) 1.900" x 1.999" x 0.126" zinc plated steel clips (Part # TH403) and four (4) #10-24 x 3/8" FHPUC screws. See Drawing #381_01, Sheet 12 of 18 for an exploded view of this assembly. NOTE: After this individual frame was assembled and prior to the installation of this frame, a continuous flat-filler plate (FL515) was snapped into each jamb mullion.

Door Stop Attachment: The first step prior to installing the door was to anchor the each jamb mullion to the substrate with structural fasteners in the locations shown on Drawing 381_01 Sheet 4. The second step was to mechanically attach each continuous head stop (Part # DS202-1) with four (4) #10 x 1-3/4" FHP TEK screws located 1" from each end and 12" on each side of the geometric centerline. The third step was to mechanically attach each jamb stop with three (3) #10 x 1-1/4" located at midpoint and 10" from each end. See 381_01 Sheets 12 and 18 for more information about the fastener locations.

Transom Glazing Pocket Assembly: A continuous fixed transom sash (Part # FL517) was attached to the transom bar/door header at ¾", 16-3/4" from each end and 16-1/2" from the geometric centerline with #12 x ¾" HWH #3 TEK screws and to the frame jambs extending above the door header at midpoint with one (1) #10 x 1-1/4" FHP TEK. NOTE: The joint between each fixed glass stop end and the window wall framing was sealed with a bead of Dow Corning 795 silicone sealant. A continuous removable transom sash glass stop (FL518) was snap-applied to the transom bar/door header and to each frame jamb on the exterior side of the transom. See Drawing 381_01 Sheets 8 (Details 7 & 10) and 9 (Detail 13).

Frame Joint Sealant: Each head member/mullion joint and each door header/mullion joint was sealed using strips of Schnee-Morehead SM5610 TackyTape ® Industrial Tape Sealant. See Drawing #381_01,Sheets 6 and 9, Details 1 and 11, for more information on the tape sealant. Each threshold/mullion joint was sealed with a bead of Dow Corning 795 silicone sealant. See Drawing 381_01, Sheet 9,Detail 12, for more detail for the placement of this sealant.

13.0 Door Construction: Each of the door panels were fabricated using all or some of the following aluminum extrusions.

Description	Part #	Overall Cross Section	Alloy
Top Rail	D102	4.000" x1.710" x 0.120"	6063-T6
Bottom Rail (E2)	D108	7.500" x 1.710" " 0.120"	6063-T6
Bottom Rail	D109	9.500" x 1.710" " 0.120"	6063-T6
Active Lock Stile	D112	3.614" x 1.750" x 0.120"	6063-T6
Inactive Leaf Lock Stile	D111	3.750" x 1.750" x 0.120"	6063-T6
Hinge Stiles	D110	3.750" x 1.750" x 0.120"	6063-T6
Adjustable Astragal	D106	0.331" x 1.562" x 0.062"	6063-T6
Top Corner Block	CB102	2.130" x 1.540" x 0.250"	6063-T6
Bottom Corner Block (E2)	CB108	2.130" x 1.540" x 0.250"	6063-T6
Bottom Corner Block	CB109	2.130" x 1.540" x 0.250"	6063-T6
Glass Stop (Applied)	DS501	1.000" x 0.5390" 0.125"	6063-T6
Glass Stop (Snap in)	DS502	0.876" x 0.539" x 0.065"	6063-T6

The following construction procedures (typical) were utilized in the assembly of the door panel:

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Door Panel Corner Construction: At each door corner, both rail ends were square cut, butted, and attached together using door corner block (Part# CB102 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.
Door Panel Bottom Corner Construction: At each bottom door panel corner, the horizontal rail was mechanically fastened to the stile with the corner blocks using one (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. See Drawing 381_01 Sheet 10 for exploded view details of the door corner construction.
Door Panel Corner Sealant: None used.
Miscellaneous Construction: A continuous aluminum sweep (Part # WS142) is applied along the bottom edge of each door leaf. Each sweep is secured to the bottom door rail 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. Note: 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 frame using DG502 glass stop on the exterior side and DG501 on the interior. DG501 is secured to the door stiles and rails using three (3) #8 x 3/4" POH-TEK screws and three (3) (Part # CS501-1) aluminum clips at midpoint and 10" from each end. For the top and bottom rails, each DG501 is attached with two (2) #8 x 3/4" POH-TEK screws and two (2) CS501-1 aluminum clips located 10" from each end. DG502 snap fits to the interior door stiles and rails. See Drawing 381_01 Sheet 18 for more information. on the attachment locations.

14.0 Glazing:

14.1 Glazing Material: There were three different glazing materials used in this sample:

Glass Type A: 9/16" thick laminated glass with the following components:
- 0.25" HS
- 0.075" Solutia VS02 Interlayer (Miami Dade NOA #03-0514.15)
- 0.25" HS

Glass Type B: 9/16" thick laminated glass with the following components:
- 0.25" HS
- 0.090" Solutia Saflex PVB Interlayer (Miami Dade NOA #03-0205.02)
- 0.25" HS

Glass Type U: 9/16" thick laminated glass with the following components:
- 0.25" HS
- 0.120" Uvekol Type "S" Interlayer (Miami Dade NOA #03-1117.05)
- 0.25" HS

NOTE: The specific make up for the laminated-glass listed above was provided to HTL by CORAL. On the manufacturer and the overall thickness of each laminate have been verified by HTL.

14.2 Window Wall Glazing Method: Each glass lite used in the window-wall portion of this sample was glazed using the following (typical) procedures:
Interior Side: Using continuous strips of an extruded EPDM interior spacer gasket (Part #NG14) and Dow Corning 995 structural silicone sealant..

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Exterior Side: Using continuous strips of an extruded EPDM exterior glazing gasket (Part #NG1). Each corner of the gasket is sealed using a 2" long cap bead of Dow Corning 795 Structural Silicone Sealant in both directions of the gasket.

14.3 Door Panel Glazing Method: Each glass lite used in each door panel 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.

14.4 Daylight Opening:

Qty.	Location	Daylight Opening	Glass Bite	Glass Type
1	Door Panel.	32-5/16" x 81-11/16"	¾"	B
1	Door Panel.	32-5/16" x 81-11/16"	¾"	U
1	Door Transom.	82" x 18- 1/2"	9/16"	A

15.0 Weather-stripping:

Qty.	Location	Description
23 lf.	Frame head and jambs.	EPDM bulb gasket (Part # NG5)
16-lf	Along adjustable astragal	Schlegel wool pile weather-strip (Part #WP106)
7-lf	3.5-lf per door panel inserted into door sweep.	Soft Vinyl door sweep gasket (Part # VG1).

16.0 Hardware:

Qty.	Location	Description
1	Meeting stile. Centerline of cylinder is located 37-7/8" above the bottom edge of door panel.	Cylinder (CORAL Part # DH078)
1	Meeting stile, top of handle is located 42-7/8" above bottom edge of door panel.	Pull Handle (CORAL Part # PH401)
1	Interior, (centerline is 38-5/32") from bottom edge of door panel.	Jackson 2086 concealed vertical rod exit device. See Sheet Drawing 381_01 Sheet 18 for more information.
3	Hinge stile, located 6" from top edge, 9" and 51-11/32" from bottom end.	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"that pass through the stile member and thread into a 10 gauge zinc plated backup plate. See Drawing 381_01 Sheet 11 for more information
1	Top rail	Jackson Offset arm assembly for COC
1	Bottom of door	Coral door bottom sweep (Part # WS142)

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Qty.	INACTIVE DOOR PANEL	
1	Meeting stile, top of handle is located 42-7/8" above bottom edge of door panel.	Pull Handle (CORAL Part # PH401)
1	Interior, (centerline is 38-5/32") from bottom edge of door panel.	Jackson 2086 concealed vertical rod exit device. See Sheet Drawing 381_01 Sheet 18 for more information.
3	Hinge stile, located 6" from top edge, 9" and 51-11/32" from bottom end.	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"that pass through the stile member and thread into a 10 gauge zinc plated backup plate. See Drawing 381_01 11 for more information.
1	Top rail	Jackson Offset arm assembly for COC
1	Bottom of door	Coral door bottom sweep (Part # WS142)

17.0 Weep Holes: N/A

18.0 Muntins: None used.

19.0 Additional Reinforcement: None used.

20.0 Sealant's Used:

Location	*Sealant*
Perimeter Sealant	Dow Corning 795 Structural Silicone Sealant
Structural Glazing Sealant	Dow Corning 995 Structural Silicone Sealant
Frame Joint Sealant.	Schnee-Morehead SM5610 TackyTape® Industrial Tape Sealant.

INSTALLATION

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

Location	Anchor Description & Schedule
Frame Head	Each individual frame head member was attached to the steel opening using two (2), 3/8" x 1-1/2" HWH TCS. These fasteners were located 20-1/2" on each side of the geometric centerline.
Frame Jambs	Attached with a single row of eight (8) 3/8" x 3-1/2" grade 2 bolts with nuts and washers located 5" from the top end and 2-3/8", 45", 51", 88", 94", 100" and 106" from the bottom end
Threshold Clip	Each threshold clip was attached to the frame jambs using two (2), #10- 24 x 3/8" FHPUC screws See Drawing #381_01, Sheet 11 for more information.
Threshold	Attached to the steel opening using a single row of four (4) #12"x 1-1/2" TEK Screws located 2" and 4" on each side of the geometric centerline.

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TEST RESULTS

22.0 SUMMARY OF RESULTS

Test Method	Test Conditions	Test Conclusion
Air Infiltration Test (ASTM E283 and TAS 202)	1.57 psf & 6.24 psf	PASS
Uniform Static Load Test (ASTM E330 and TAS 202)	+ 70 and – 80 psf Design Pressure	PASS
Forced Entry Resistance Test (TAS 202 [SFBC 3603.2 (b) 5])	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)	+ 70 and – 80 psf Design Pressure	PASS

23.0 TEST RESULTS:

23.1 AIR INFILTRATION TEST RESULTS:

Test Pressure	Measured	Allowed
1.57 psf	0.46 cfm/ft^2	0.50 cfm/ft^2
6.24 psf	1.38 cfm/ft^2	N/A

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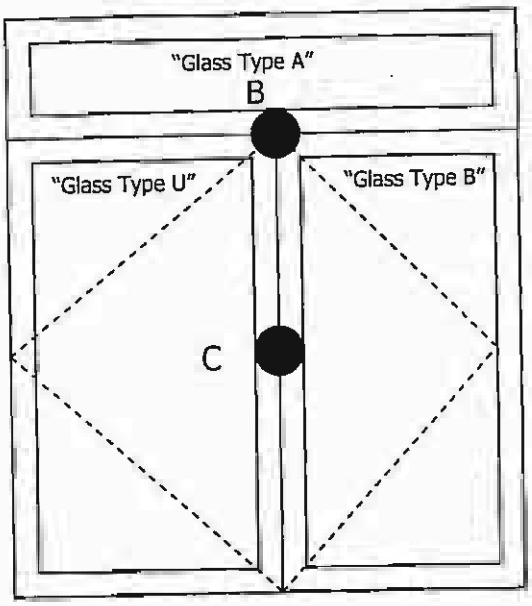
23.2 UNIFORM STATIC LOAD TEST RESULTS:

23.2.1 LOCATION OF DEFLECTION MEASUREMENTS:



23.2.2 PERMANENT SET DATA:

POSITIVE LOAD:

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.01	0.17
+ 70.00	0.03	0.17
+ 105.00	0.09	0.17

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.03	0.38
+ 70.00	0.05	0.38
+ 105.00	0.11	0.38

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NEGATIVE LOAD:

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.05	0.17
- 80.00	0.07	0.17
- 120.00	0.14	0.17

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.11	0.38
- 80.00	0.17	0.38
- 120.00	0.30	0.38

23.2.3 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.

23.3 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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23.4 LARGE MISSILE IMPACT TEST

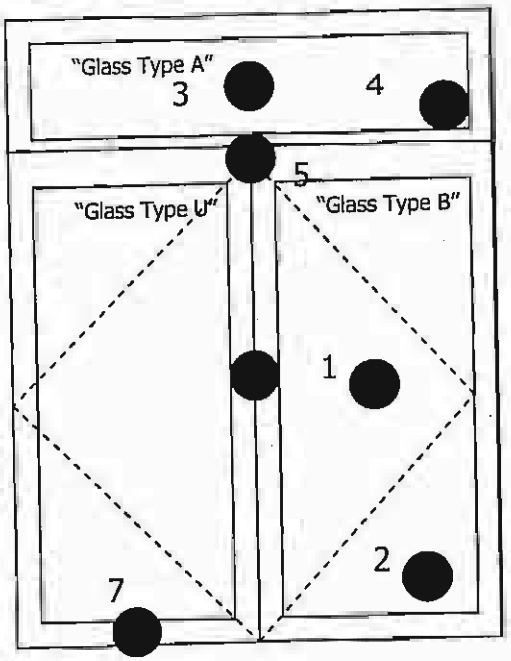
Missile Length: *96"*
Missile Weight: *9-lb. 2-oz.*

Impact #	Velocity (ft/s)	Glass Temperature (°F)	X Coordinate (in.)	Y Coordinate (in.)
1	50.20	66.00	66.75	53.00
2	50.20	66.00	72.00	18.00
3	48.90	80.00	41.00	108.00
4	49.98	80.00	78.00	106.00
5	50.15	N/A	45.00	97.00
6	50.18	N/A	46.50	48.00
7	50.38	N/A	23.50	5.00

23.4.1 IMPACT LOCATIONS AND REMARKS:

Impact #'s 1 - 7 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.



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23.5 CYCLIC LOAD TEST

23.5.1 TEST PARAMETERS:

Positive Design Load	70 psf
Negative Design Load	80 psf

23.5.2 TEST SPECTRUM:

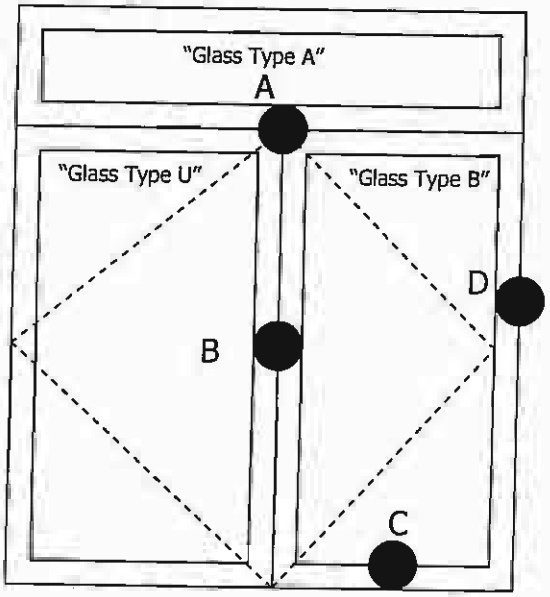
Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
14 – 35 (psf)	**0 – 42 (psf)**	**35 – 56 (psf)**	**21 – 70 (psf)**
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
24 – 80 (psf)	**40 – 64 (psf)**	**0 – 48 (psf)**	**16 – 40 (psf)**
50	1050	50	3350

23.5.3 DEFLECTION GAGE LOCATIONS:



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23.6 PERMANENT SET DATA:

Location	INWARD (POSITIVE) LOAD		OUTWARD (NEGATIVE) LOAD	
	Measured Permanent Set (in.)	Allowable Permanent Set (in.)	Measured Permanent Set (in.)	Allowable Permanent Set (in.)
A	0.09	0.17	0.13	0.17
B	0.25	0.38	0.18	0.38
C	0.08	0.16	0.13	0.16
D	0.06	0.24	0.13	0.24

23.7 REMARKS:
This sample was 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

24.0 CERTIFICATION & DISCLAIMER STATEMENT:
All tests performed on this test specimen were witnessed 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, in Lithia Springs, Georgia. 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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25.0 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 E331 – Standard Test Method for Water Penetration 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.

26.0 LIST OF OFFICIAL OBSERVERS (All or Partial):

Vinu J. Abraham – HTL, Professional Engineer
José E. Colón, E.I. – HTL, Operations Manager
Andrew Bush - HTL
Ian J. Mckenzie – HTL
JD Williams - Coral

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FL Reg. #53280

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, AL 35406

2.0 CONTACT PERSON: JD Williams

3.0 HTL TEST NOTIFICATION #: HTLGA07008

4.0 HTL LAB CERTIFICATION: Miami-Dade County (04-0806.02)
Florida Building Code #TST3892
IAS #TL-388

PRODUCT IDENTIFICATION

5.0 Product Types: Medium Stile Doors with 3-point lock.

6.0 Model Number: CORAL Series 381 Medium Stile Entrance Doors installed into FL500 framing.
Performance Class: +70/-80

7.0 Overall Size: 89" (w) x 98-1/2" (h)

8.0 Door Panel Sizes: Two panels, each panel is 42" (w) x 96" (h).

9.0 Configuration: Operable pair of doors

10.0 Drawing: This test report is incomplete without the attached Coral Drawing "381_01" (sheets 1-18) bearing the raised seal of Hurricane Test Laboratory, LLC.

PRODUCT DESCRIPTION

12.0 Frame Construction: The frame was fabricated using some or all of the following aluminum extrusions:

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

The following procedures (typical) were utilized when assembling each door panel:
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 381_01 Sheet 11 for exploded view of this assembly.
Door Stop Attachment: Each continuous head stop (Part DS500-1) was mechanically attached for 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 REK 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 381_01 Sheet 11 for exploded view of this assembly.
Frame Filler: Each continuous flat filler plate (Part # FL515) was snap applied to each jamb.

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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 705 silicone sealant.

13.0 Door Construction: Each of the door panels was fabricated using all or some of the following aluminum extrusions.

Description	Part #	Overall Cross Section	Alloy
Top Rail	D102	4.000" x1.710" x 0.120"	6063-T6
Bottom Rail	D108	7.500" x 1.710" " 0.120"	6063-T6
Bottom Rail	D109	9.500" x 1.710" " 0.120"	6063-T6
Active Lock Stile	D112	3.614" x 1.750" x 0.120"	6063-T6
Inactive Leaf Lock Stile	D111	3.750" x 1.750" x 0.120"	6063-T6
Hinge Stiles	D110	3.750" x 1.750" x 0.120"	6063-T6
Adjustable Astragal	D106	0.331" x 1.562" x 0.062"	6063-T6
Top Corner Block	CB102	2.130" x 1.540" x 0.250"	6063-T6
Bottom Corner Block	CB108	2.130" x 1.540" x 0.250"	6063-T6
Bottom Corner Block	CB109	2.130" x 1.540" x 0.250"	6063-T6
Glass Stop (Applied)	DS501	1.000" x 0.5390" 0.125"	6063-T6
Glass Stop (Snap-In)	DS502	0.876" x 0.539" x 0.065"	6063-T6

The following construction procedures (typical) were utilized in the assembly of the door panel:
Door Panel Corner Construction: At each door corner, both rail ends were square cut, butted, and attached together using door corner block (Part# CB102 for the top rail and Part # CB109 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.
Door Panel Bottom Corner Construction: At each bottom door panel corner, the horizontal rail was mechanically fastened to the stile with the corner blocks using one (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. See Drawing 381_01 Sheet 10 for exploded view details of the door corner construction.
Door Panel Corner Sealant: None used.
Miscellaneous Construction: A continuous aluminum sweep (Part # WS142) is applied along the bottom edge of 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. Note: 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 frame using DG502 glass stop on the exterior side and DG501 on the interior. DG501 is secured to the exterior door stiles and rails using three (3) #8 x 3/4" POH-TEK screws and three (3) (Part # CS501-1) aluminum clips at midpoint and 10" from each end. For the top and bottom rails, each DG501 is attached with two (2) #8 x 3/4" POH-TEK screws and two (2) CS501-1 aluminum clips located 10" from each end. DG502 snap fits to the interior door stiles and rails. See Drawing 381_01 Sheet 18 for more information.

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14.0 Glazing:

14.1 Glazing Material: There were two different glazing materials used in this sample:

Glass Type B: 0.590" thick laminated glass with the following components:
- 0.25" HS
- 0.090" Solutia Saflex PVB Interlayer (Miami Dade NOA #03-0205.02)
- 0.25" HS

Glass Type U: 0.620" laminated glass with the following components:
- 0.25" HS
- 0.120" Uvekol Type "S" Interlayer (Miami Dade NOA #03-1117.05)
- 0.25" HS

14.2 Glazing Method: Each glass lite used in the door leaf was glazed using the following (typical) procedures:

DG502 Glass Stop: Using a single row of 0.188 EPDM glazing gasket (Part #NG1).

DG201 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.

14.3 Daylight Opening:

Qty.	Location	Daylight Opening	Glass Bite	Glass Type
1	Door Panel.	32-5/16" x 78-11/16"	¾"	B
1	Door Panel.	32-5/16" x 78-11/16"	¾"	U

15.0 Weather-stripping:

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

16.0 Hardware:

Qty.	Location	Description
6	Three (3) per door panel, located on the door panel hinge stile, 6" from the top edge and 9" and 51-11/32" from the bottom edge	Butt Hinge (Part #DH109). Each hinge was attached to the frame jamp using four (4) #12-24 x ½", and to the door stile using four (4) # 12-24 x ¼".
2	Exterior of doors	Coral pull handle (Part # PH1-10)
2	Interior of doors	Coral push bard (Part # PB1-42)
1	Active door	Cylinder (Part # DH078)
1	Active door	Jackson Offset arm assembly for COC
2	Inactive door	Steel top flush bolt (Part # DH176-96) located 22" from the top and (Part # DH176) 10" from bottom.
2	Bottom of doors	Coral door bottom sweep (Part # WS142).

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17.0 Sealant's Used:

Location	*Sealant*
Perimeter Sealant	Dow Corning 795 Structural Silicone Sealant
Frame Joint Sealant.	Schnee-Morehead SM5610 TackyTape® Industrial Tape Sealant.

INSTALLATION

18.0 Following is a description of how this sample was installed in the 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 (4), 3/8" x 3-1/2" GRD 2 with nuts and washers.	5" from the top 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.

TEST RESULTS

19.0 SUMMARY OF RESULTS

Test Method	Test Conditions	Test Conclusion
Uniform Static Load Test (ASTM E330 and TAS 202)	+ 70 and – 80 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)	+ 70 and – 80 psf Design Pressure	PASS

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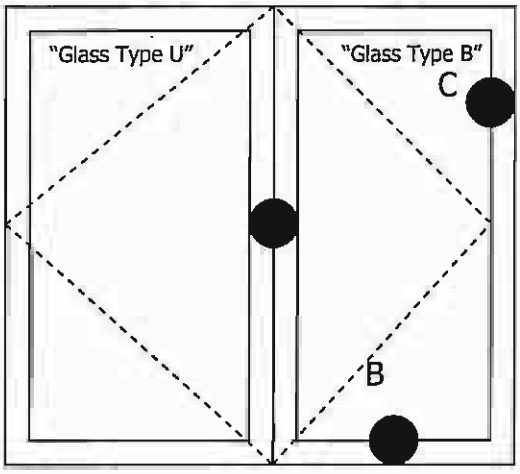
20.0 TEST RESULTS:

20.1 UNIFORM STATIC LOAD TEST RESULTS:

20.1.1 LOCATION OF DEFLECTION MEASUREMENTS:



20.1.2 PERMANENT SET DATA:

POSITIVE LOAD:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.06	0.38
+ 70.00	0.09	0.38
+ 105.00	0.14	0.38
LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.04	0.17
+ 70.00	0.08	0.17
+ 105.00	0.13	0.17

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LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
+ 52.50	0.01	0.17
+ 70.00	0.02	0.17
+ 105.00	0.05	0.17

NEGATIVE LOAD:

LOCATION A		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.14	0.38
- 80.00	0.21	0.38
- 120.00	0.34	0.38

LOCATION B		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.10	0.17
- 80.00	0.14	0.17
- 120.00	0.35	0.17

LOCATION C		
LOAD (psf)	Permanent Set (in.)	
	Measured	Allowed
- 60.00	0.04	0.17
- 80.00	0.06	0.17
- 120.00	0.09	0.17

20.1.3 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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20.2 LARGE MISSILE IMPACT TEST

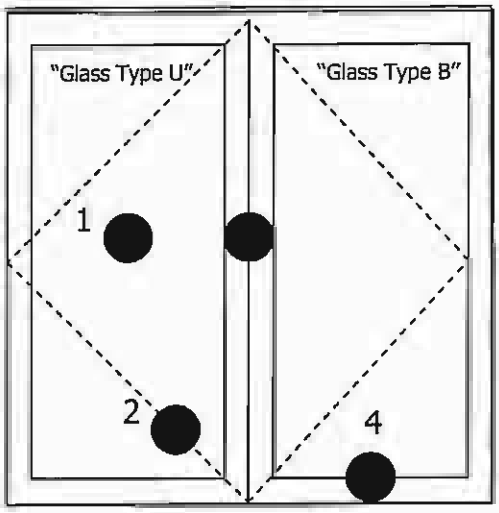
Missile Length: *96"*
Missile Weight: *9-lb. 2-oz.*

Impact #	Velocity (ft/s)	Glass Temperature (°F)	X Coordinate (in.)	Y Coordinate (in.)
1	49.60	79.00	24.00	53.00
2	50.18	79.00	45.00	50.50
3	50.56	N/A	44.50	48.00
4	50.94	N/A	66.00	6.50

20.2.1 IMPACT LOCATIONS AND REMARKS:

Impact #'s 1 - 4 hit the intended targets resulting n 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.



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FL Reg. #53280

20.3 CYCLIC LOAD TEST

20.3.1 TEST PARAMETERS:

Positive Design Load	70 psf
Negative Design Load	80 psf

20.3.2 TEST SPECTRUM:

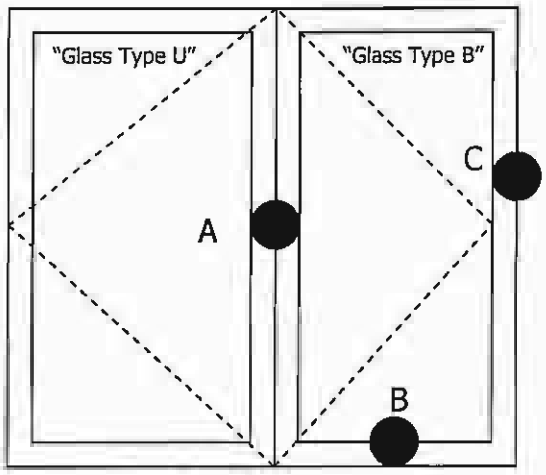
Positive Loads:

# OF INWARD ACTING CYCLES/STAGE			
14 – 35 (psf)	**0 – 42 (psf)**	**35 – 56 (psf)**	**21 – 70 (psf)**
3500	300	600	100

Negative Loads:

# OF OUTWARD ACTING CYCLES/STAGE			
24 – 80 (psf)	**40 – 64 (psf)**	**0 – 48 (psf)**	**16 – 40 (psf)**
50	1050	50	3350

20.3.3 DEFLECTION GAGE LOCATIONS:



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Vinu J. Abraham, P.E.
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20.4 PERMANENT 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	0.13	0.17	0.13	0.17
B	0.18	0.38	0.25	0.38
C	0.08	0.16	0.13	0.16
D	0.13	0.24	0.18	0.24

20.5 REMARKS:
This sample was 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

21.0 CERTIFICATION & DISCLAIMER STATEMENT:
All tests performed on this test specimen were witnessed 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, in Lithia Springs, Georgia. 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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Vinu J. Abraham, P.E.
FL Reg. #53280

22.0 APPLICABLE CODES, STANDARDS & TEST METHODS:

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.

23.0 LIST OF OFFICIAL OBSERVERS (All or Partial):

Vinu J. Abraham – HTL, Professional Engineer
José E. Colón, E.I. – HTL, Operations Manager
Andrew Bush - HTL
Ian J. Mckenzie – HTL
JD Wiliams - Coral

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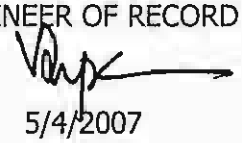

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FL Reg. #53280

DRAWINGS

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

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
C.O.C. = CONCEALED OVERHEAD CLOSER

Hurricane Test Laboratory
HTL, LLC
Tested unless
Otherwise Noted
Date 5/4/07
Job # 0402-030507

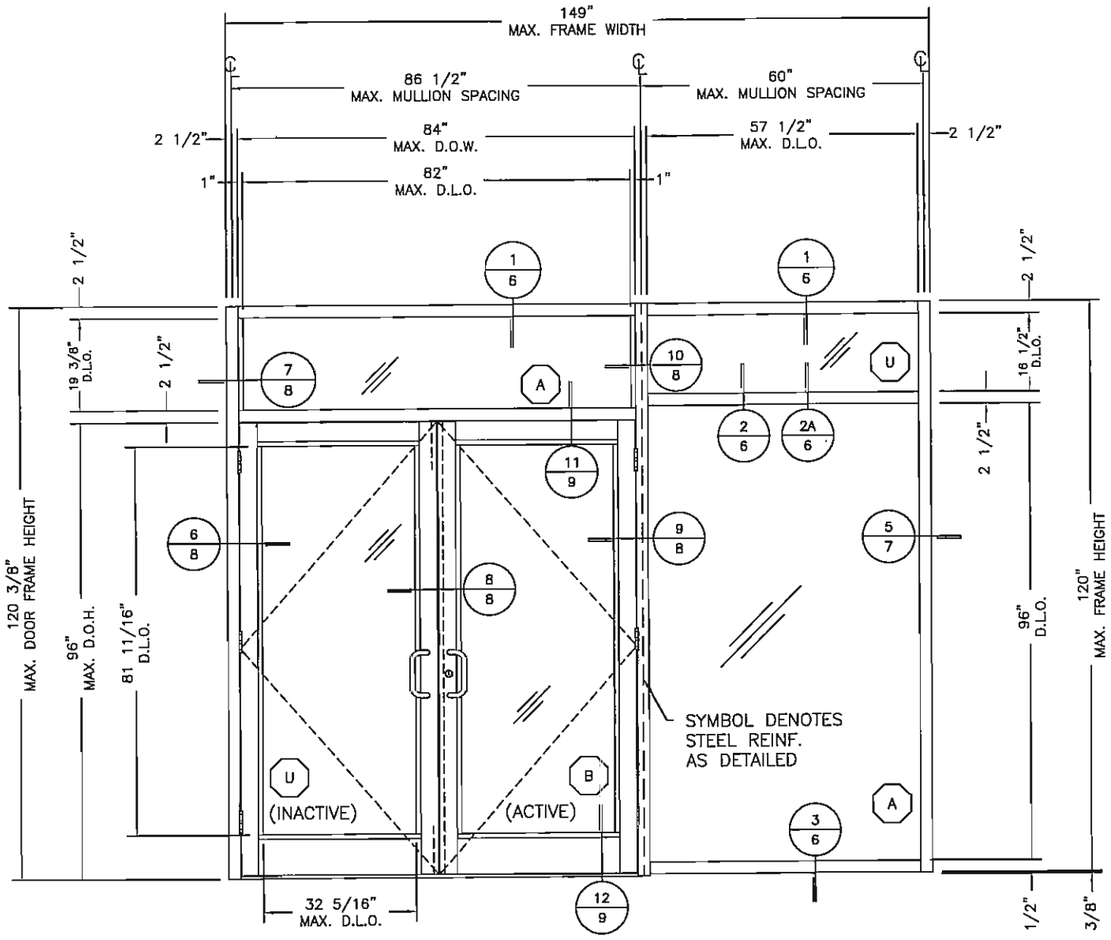
REV	BY	DATE	DESCRIPTION
---	---	---	---

Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35403
PHONE: 800-772-7737 FAX: 800-255-7320

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

INDEX TO DRAWINGS AND NOTES

DATE 4/18/2007
DRAWN PCH | CHECKED JDW | APPROVED JDW
PROJECT NO. HTL TEST
DRAWING NO. 381_01
SHEET 1 OF 18



ELEVATION E1
SERIES 381 IMPACT RESISTANT DOORS WITH 3-POINT LOCK IN FL500 FRAMING
(REF. HDW. SCHEDULE E1)

TESTING
AIR, STATIC, FORCED ENTRY, IMPACT AND CYCLE

DESIGN PRESSURE = +70/−80 PSF

STEEL TEST BUCK

X = LARGE MISSILE IMPACT LOCATIONS

0 1'−4" 2'−8" 5'−4"

SCALE: 3/8"=1'−0"

Hurricane Test Laboratory

Tested unless Otherwise Noted

Date 5/2/07

Job # G402-0305-07

REV	BY	DATE	DESCRIPTION

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

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

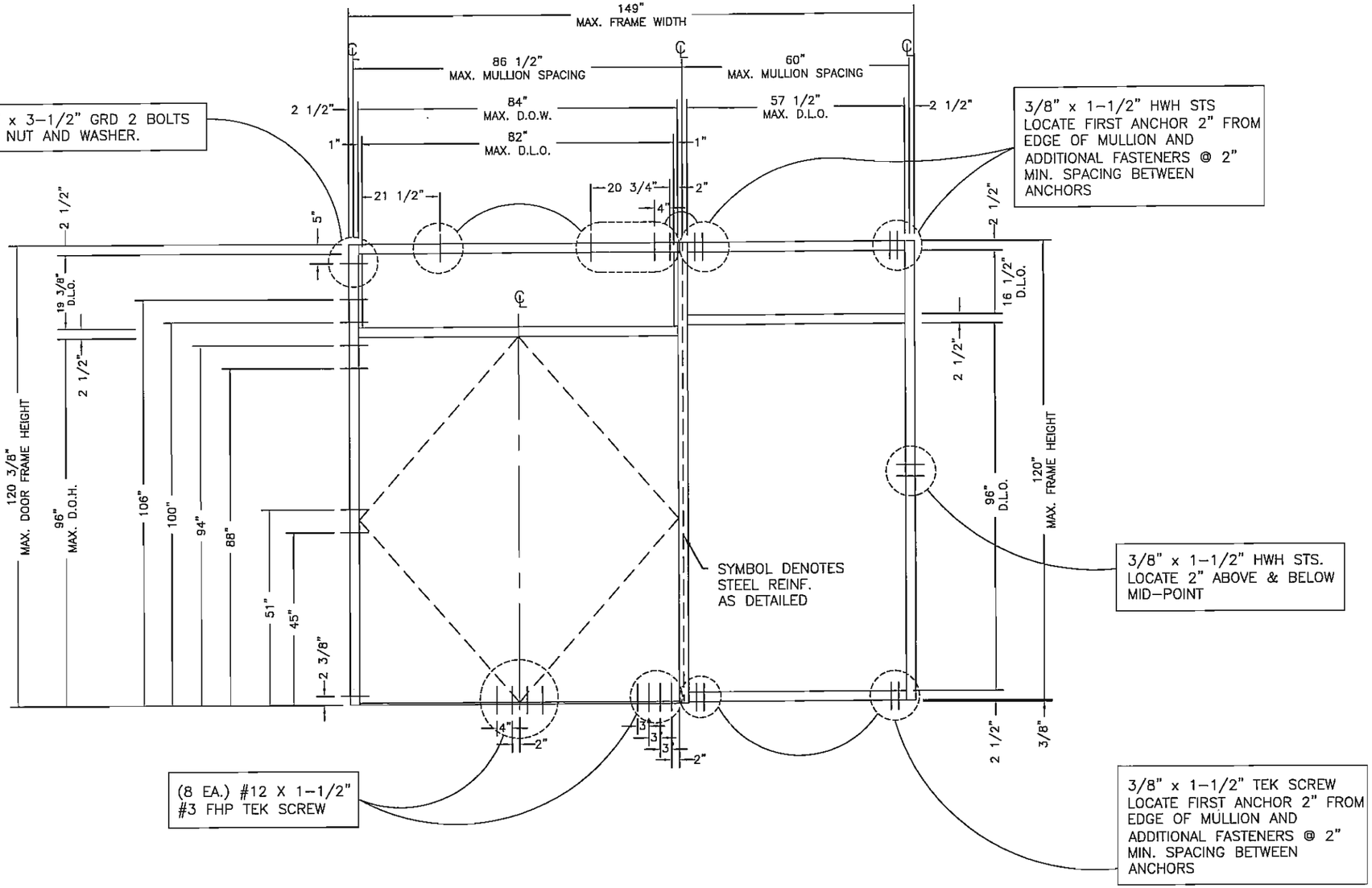
DOOR AND FRAMING ELEVATIONS

DATE		
4/18/2007		
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

SHEET 2 OF 18



ELEVATION E1
FRAME ANCHOR LOCATIONS

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

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

Hurricane Test Laboratory

Tested unless
Otherwise Noted
Date 5/2/07
Job # G402-0305-07

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

REV	BY	DATE	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR
SERIES 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

DOOR AND FRAMING ELEVATIONS

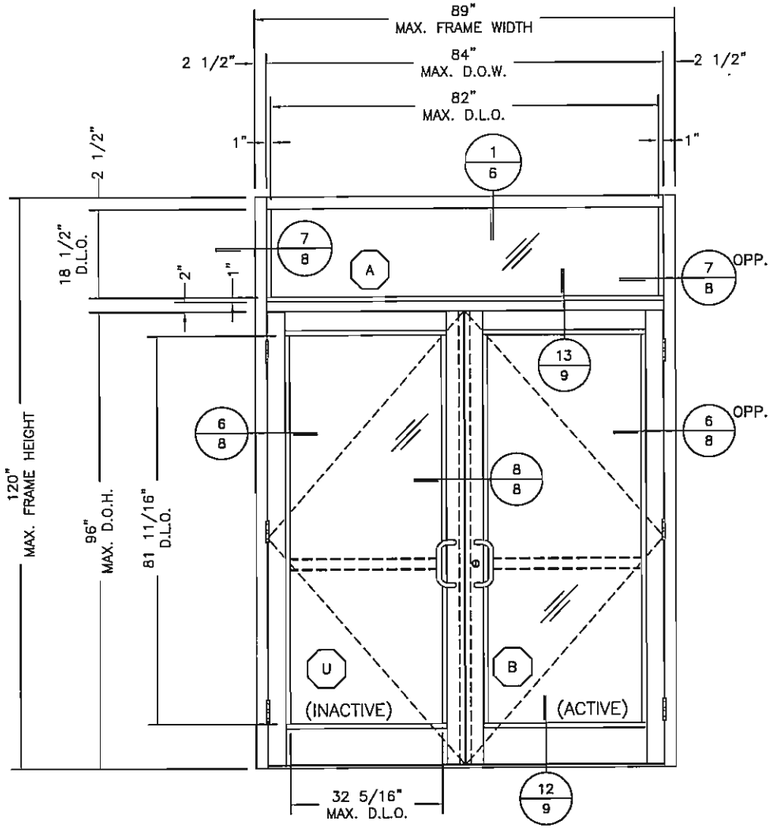
DATE 4/18/2007

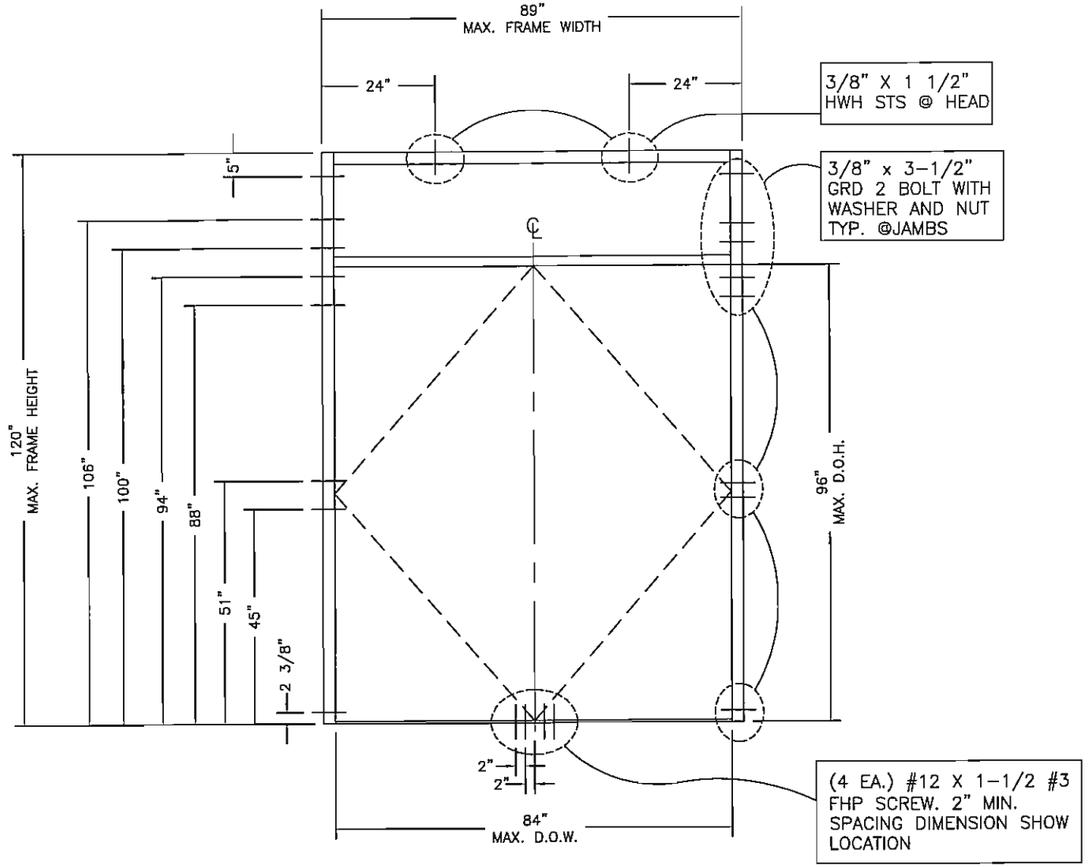
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

SHEET 3 OF 18





FRAME ANCHOR LOCATIONS

ELEVATION E2
SERIES 381 IMPACT RESISTANT DOORS WITH JACKSON 2086 EXIT DEVICES AND C.O.C. WITH OFFSET ARM IN FL500 FRAMING
(REF. HDW. SCHEDULE E2)

TESTING
AIR, STATIC, FORCED ENTRY, IMPACT AND CYCLE

DESIGN PRESSURE = +70/-80 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 # G-402-0305-01

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

REV	BY	DATE	DESCRIPTION

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

DOOR AND FRAMING ELEVATIONS

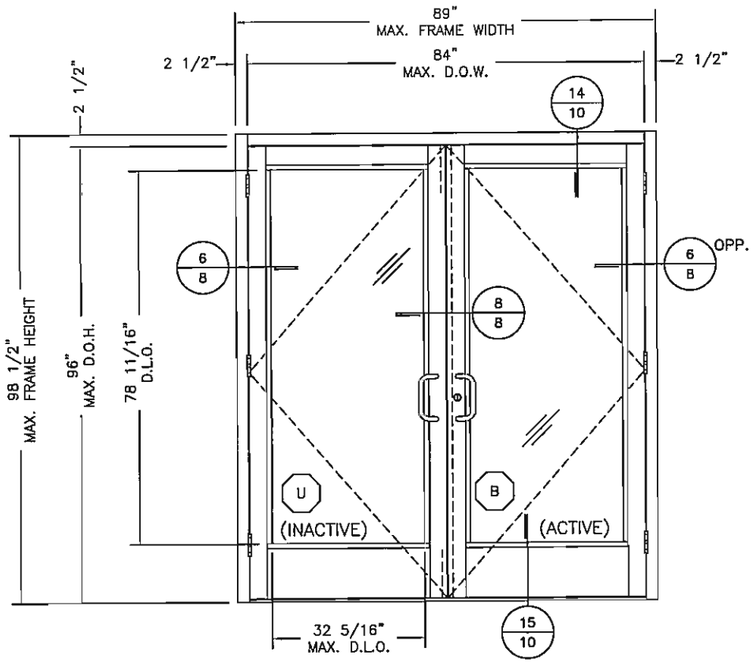
DATE 4/18/2007

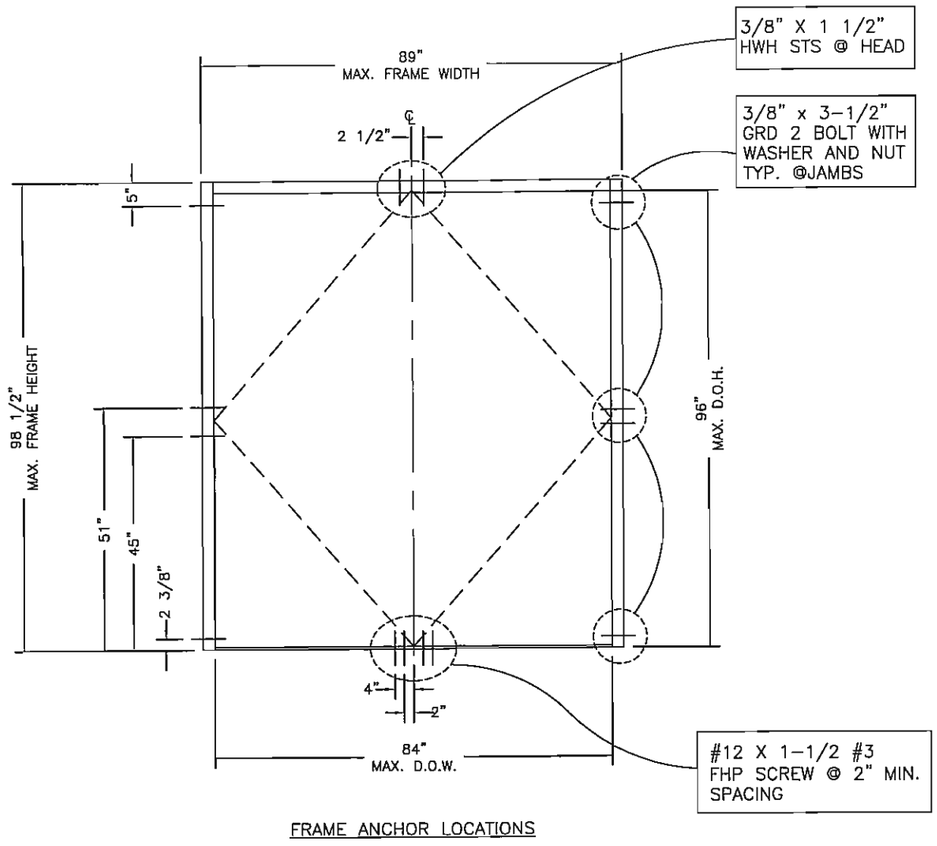
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

SHEET 4 OF 18





FRAME ANCHOR LOCATIONS

ELEVATION E3
SERIES 381 IMPACT RESISTANT DOORS WITH 3-POINT LOCK IN FL500 FRAMING
(REF. HDW. SCHEDULE E3)

TESTING
STATIC, IMPACT AND CYCLE

DESIGN PRESSURE = +70/-80 PSF

STEEL TEST BUCK

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

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

Hurricane Test Laboratory

HTL, LLC

Tested unless Otherwise Noted

Date 5/3/07

Job # G402-0307-07

REV	BY	DATE	DESCRIPTION

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

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

DOOR AND FRAMING ELEVATIONS

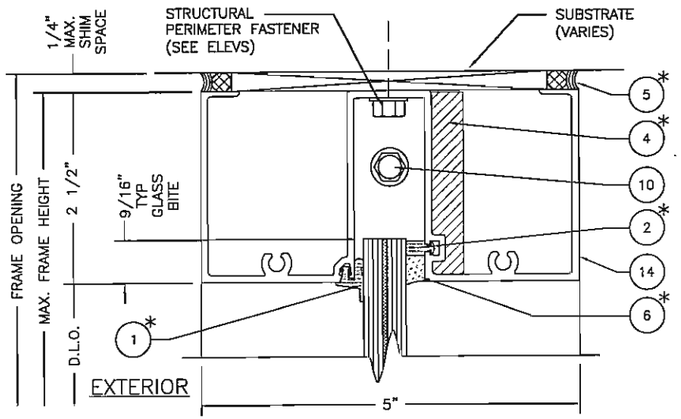
DATE 4/18/2007

DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

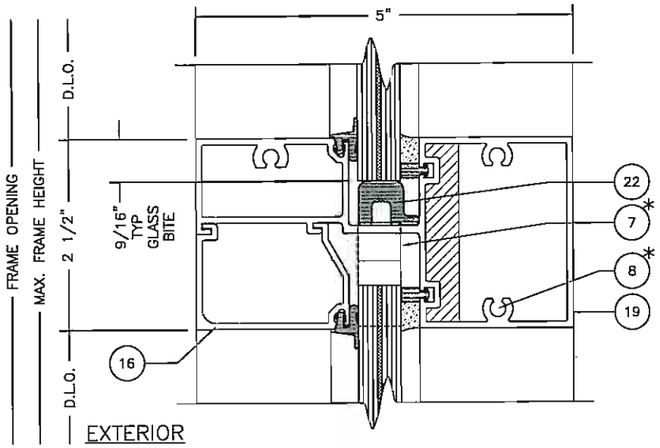
PROJECT NO. HTL TEST

DRAWING NO. 381_01

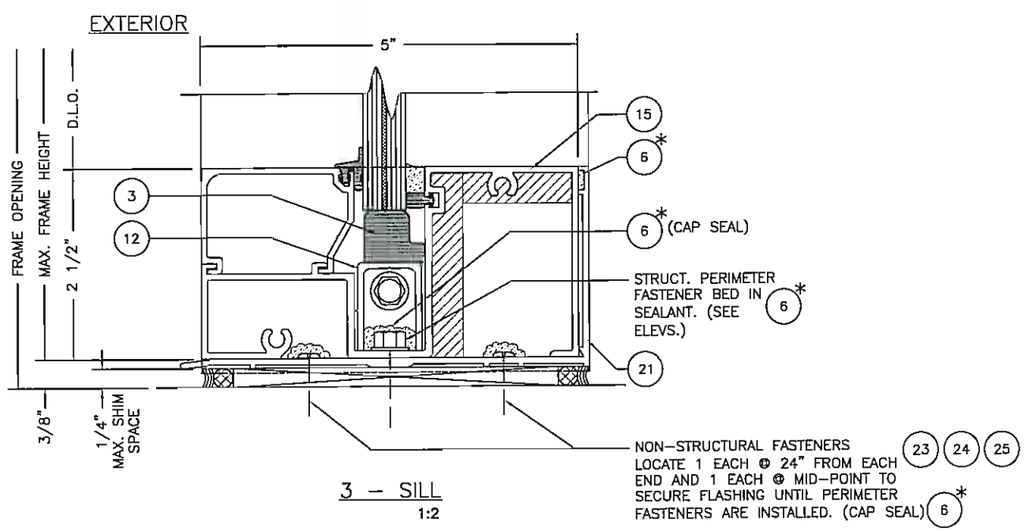
SHEET 5 OF 18



1 – HEAD
1:2



2 – INVERTED HORIZ. MULLION
1:2



3 – SILL
1:2

1 TYPICAL EXTERIOR GASKET

2 TYPICAL INTERIOR SPACER GASKET

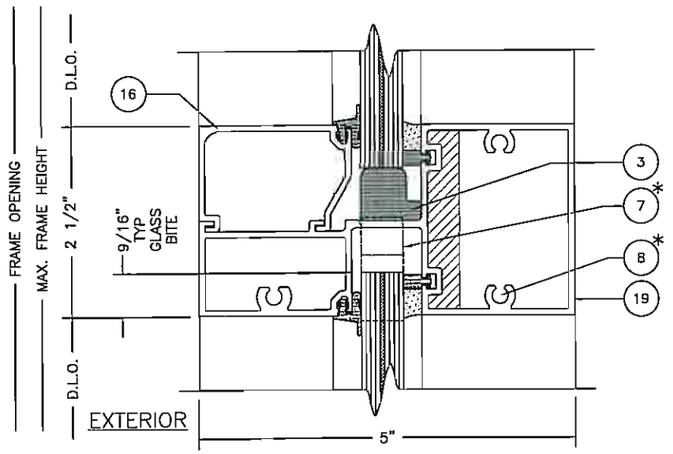
4 TYPICAL @ALL JOINT INTERSECTIONS

5 TYPICAL EXT/INT PERIMETER SEALANT

6 TYPICAL INTERIOR SEALANT @GLASS

7 TYPICAL EA. END INTERM. HORIZONTAL

8 TYPICAL @ALL SPLINES



2A – ALT HORIZ. MULLION
1:2

Hurricane Test Laboratory
HTL
Tested unless Otherwise Noted
Date 5/4/07
Job # G402-0501-07

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

REV	BY	DATE	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

FRAMING DETAILS

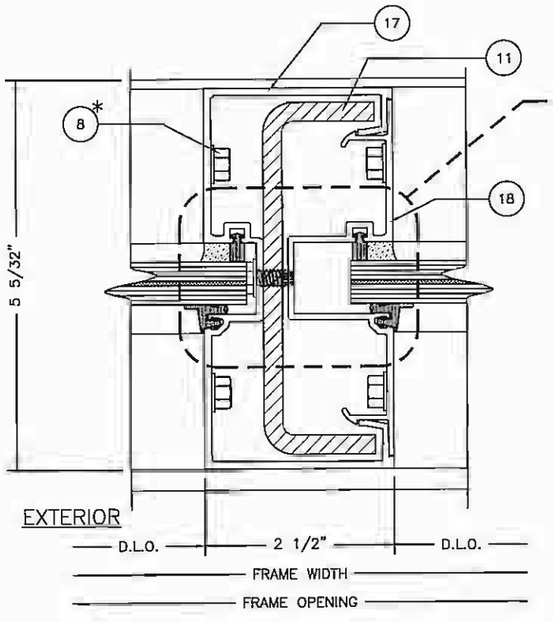
DATE 4/18/2007

DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

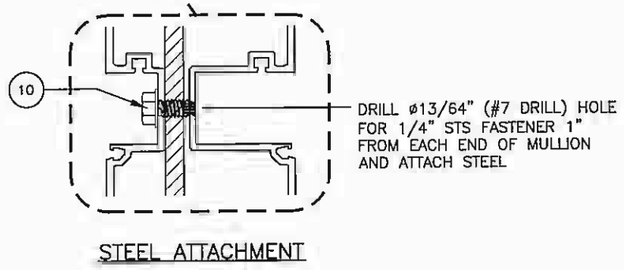
PROJECT NO. HTL TEST

DRAWING NO. 381_01

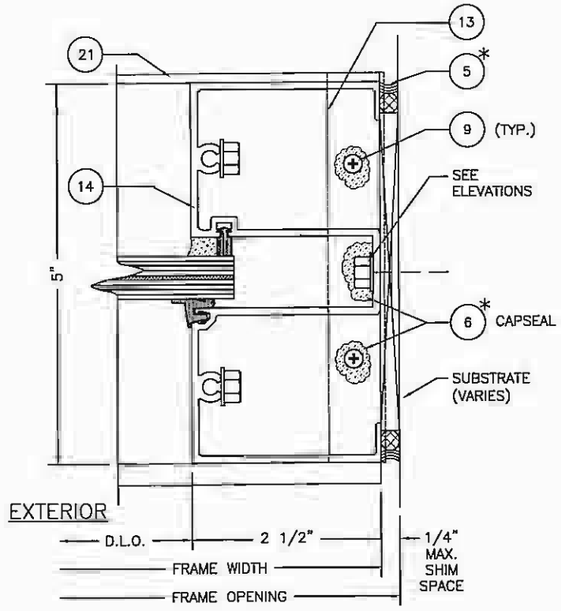
SHEET 6 OF 18



4 – VERT. MULLION WITH STEEL
1:2



STEEL ATTACHMENT



5 – JAMB
1:2

Hurricane Test Laboratory
H-HTL LLC
Tested unless Otherwise Noted
Date 5/4/07
Job # G-402-0305-01

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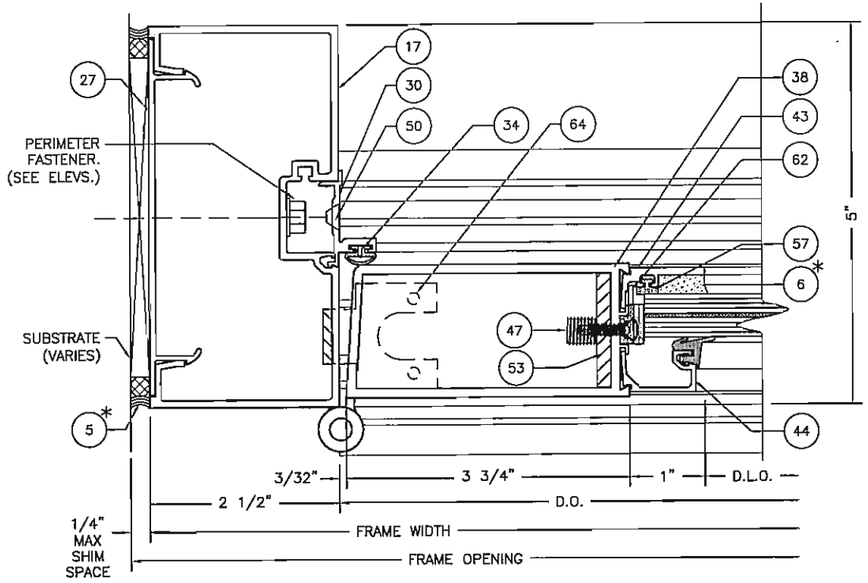
Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-255-7320

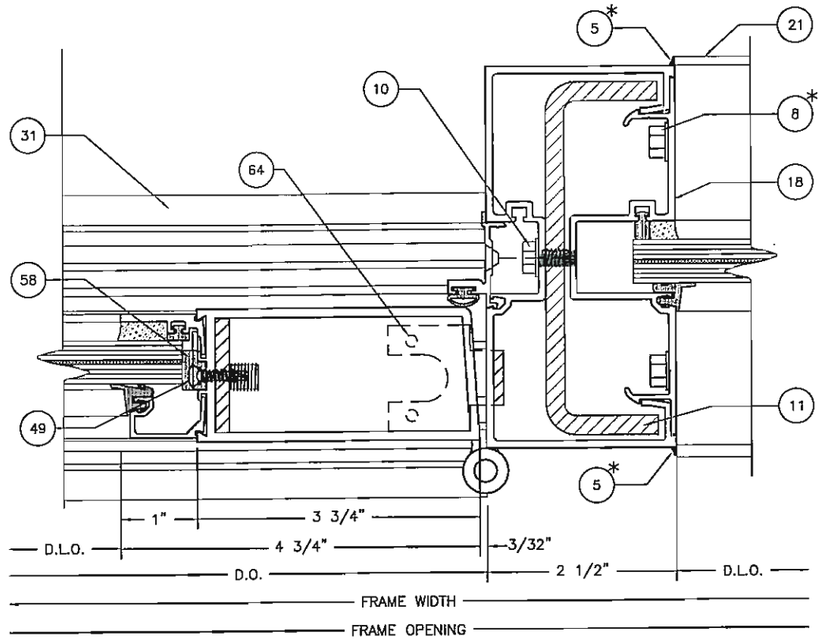
HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

FRAMING DETAILS

DATE	4/18/2007	
DRAWN PCH	CHECKED JDW	APPROVED JDW
PROJECT NO.	HTL TEST	
DRAWING NO.	381_01	
SHEET	7 OF 18	

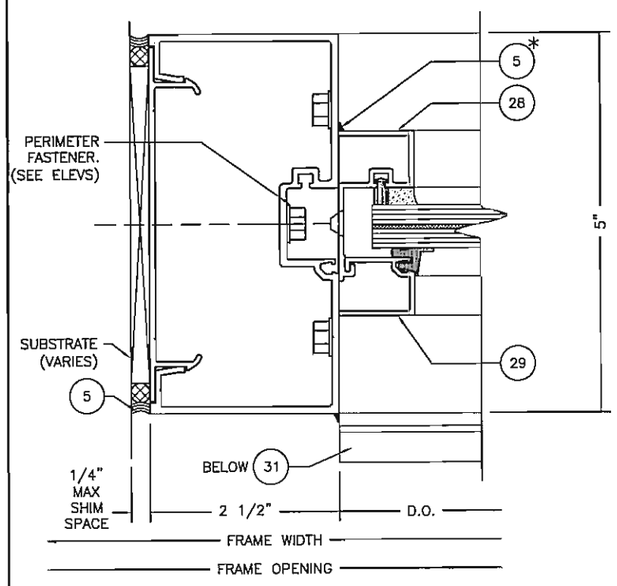


6 – DOOR JAMB AT WALL
1:2

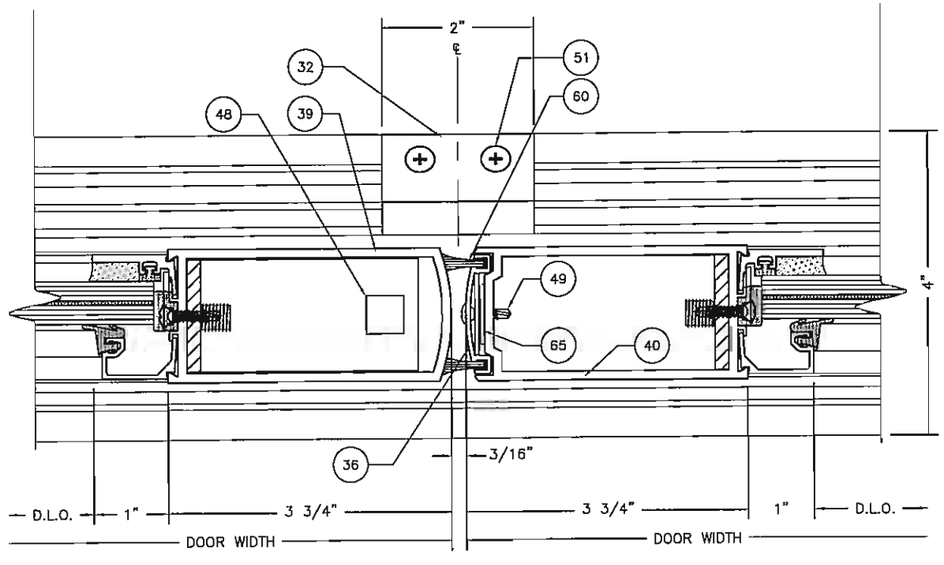


9 – INTERM. DOOR JAMB
1:2

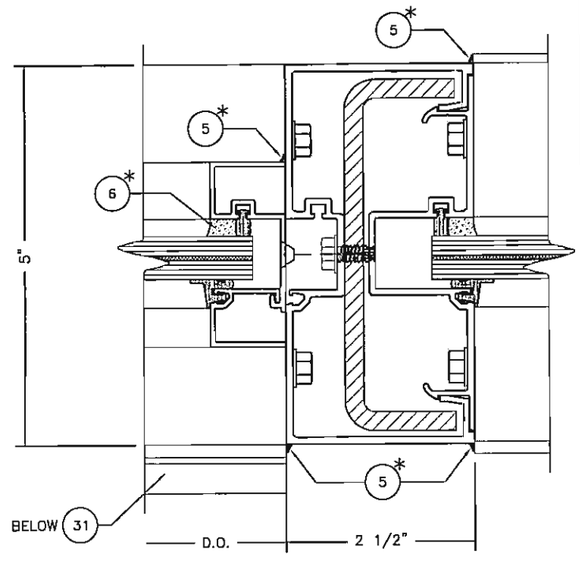
Hurricane Test Laboratory
HTL, LLC
Tested unless
Otherwise Noted
Date 5/2/07
Job # G402-0305-07



7 – TRANSOM JAMB AT WALL
1:2



8 – MEETING STILES
1:2



10 – INTERM. TRANSOM JAMB
1:2

REV	BY	DATE	DESCRIPTION
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Coral
Architectural Products
3010 RICE MINE ROAD TUSCALOOSA, AL 35406
PHONE: 800-772-7737 FAX: 800-235-7320

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

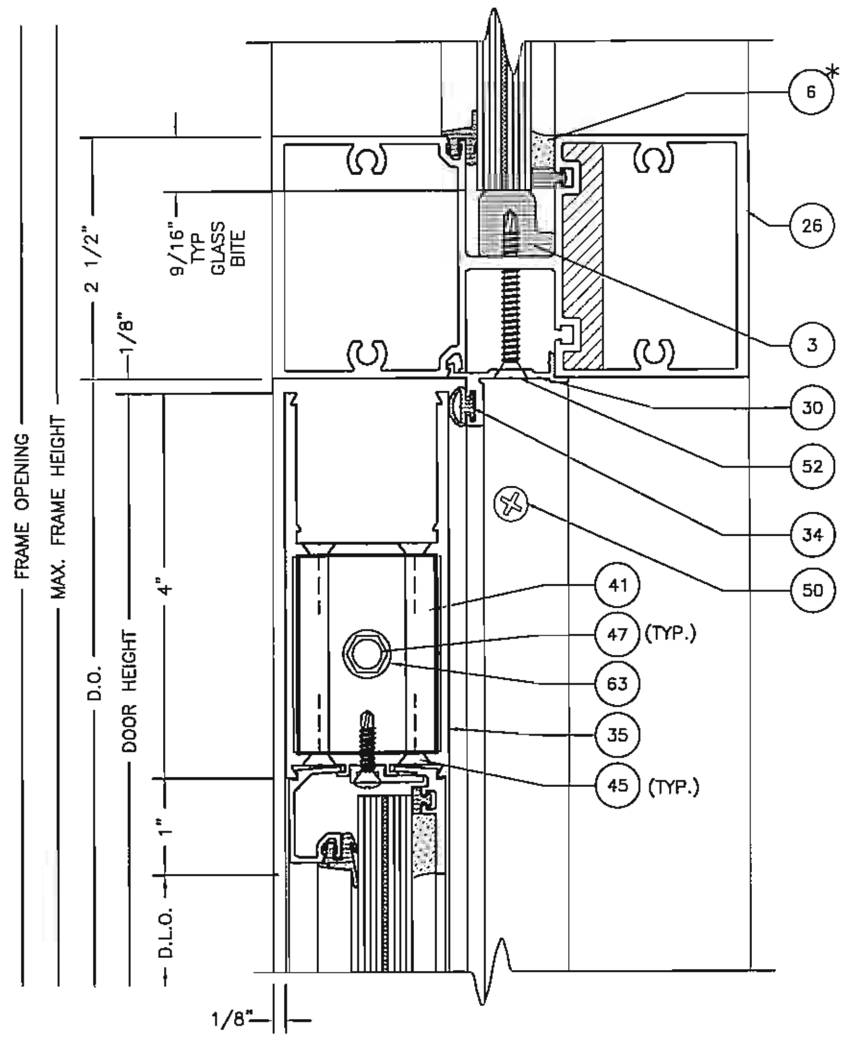
DOOR AND FRAMING DETAILS

DATE		
4/18/2007		
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

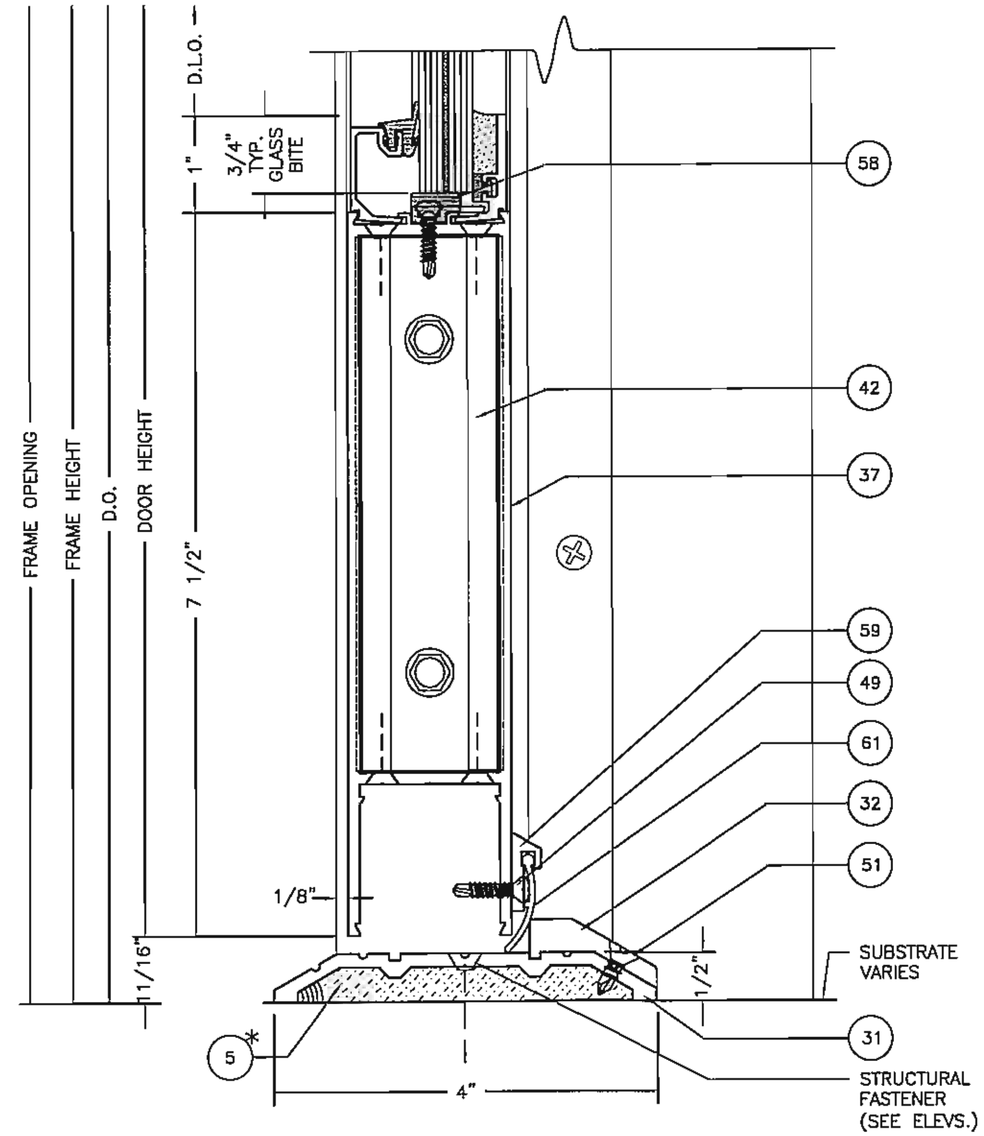
PROJECT NO.
HTL TEST

DRAWING NO.
381_01

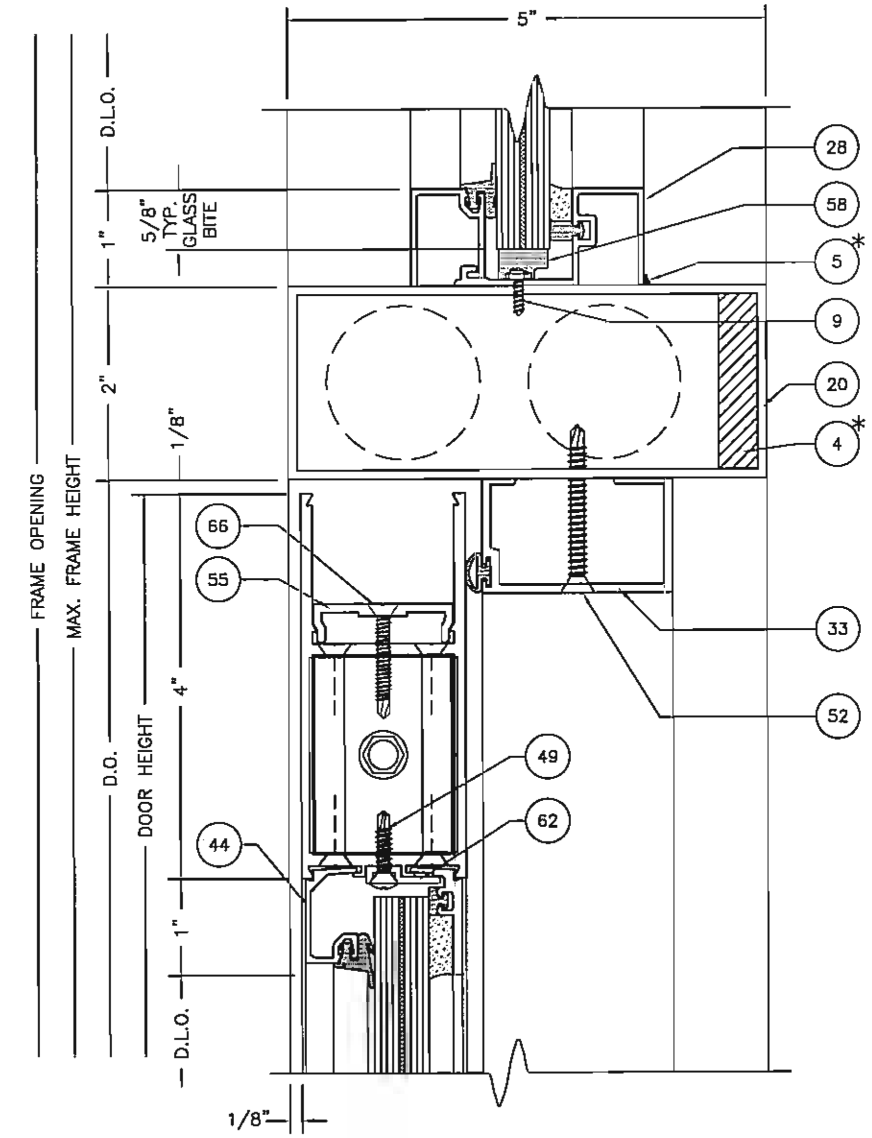
SHEET
8 OF 18



11 – TRANSOM BAR FOR SURFACE CLOSER
1:2



12 – THRESHOLD
1:2



13 – COC TRANSOM BAR WITH OFFSET ARM
1:2

Hurricane Test Laboratory
HTL
Tested unless Otherwise Noted
Date 5/2/07
Job # G406-0305-07

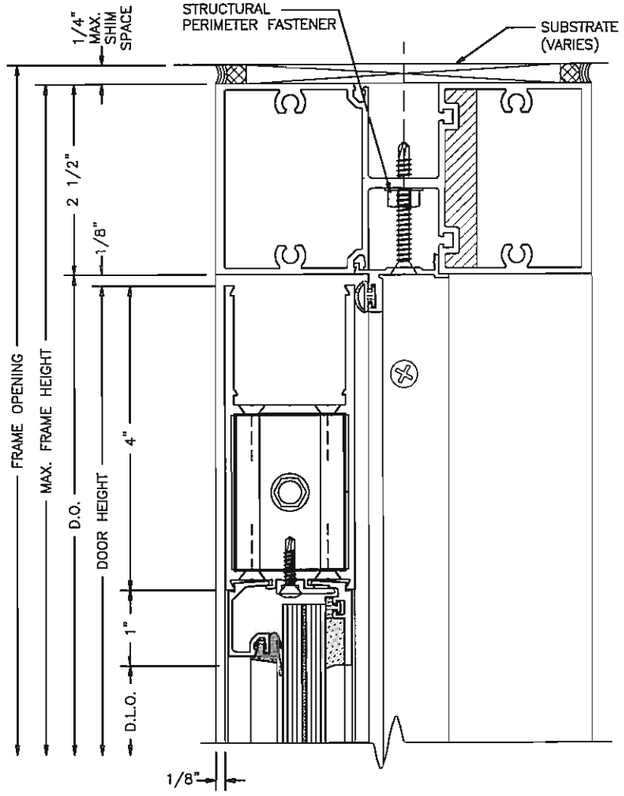
REV	BY	DATE	DESCRIPTION

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

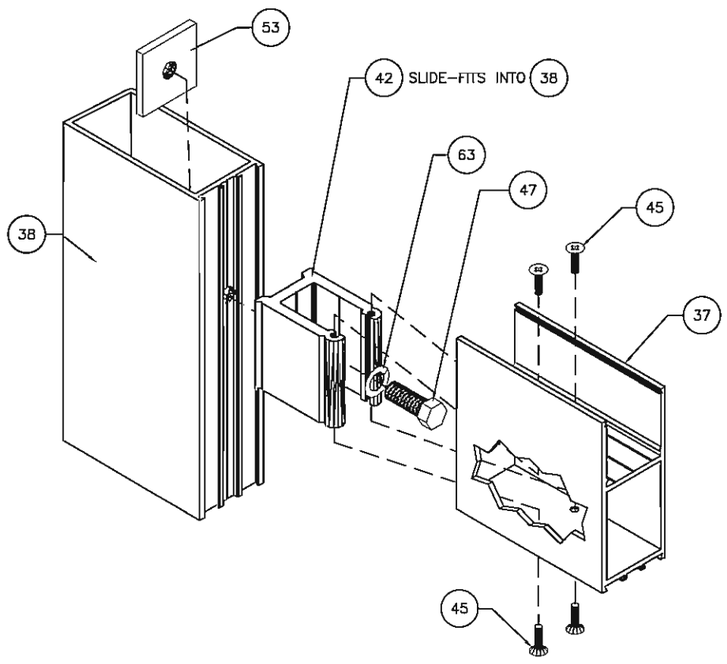
HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

DOOR AND FRAMING DETAILS

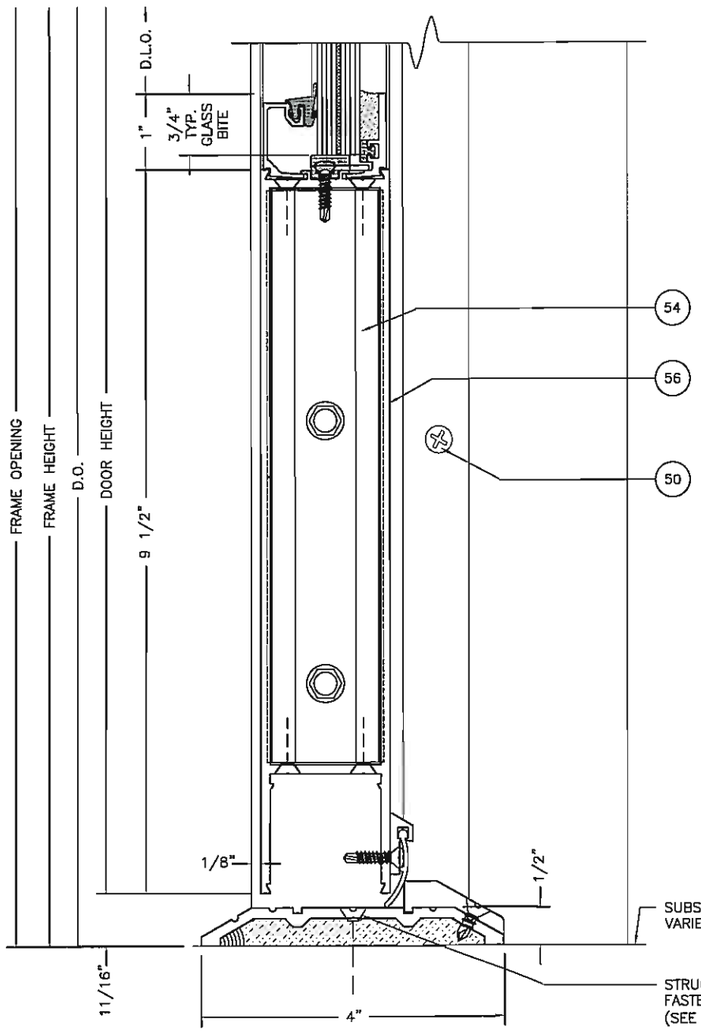
DATE 4/18/2007		
DRAWN PCH	CHECKED JDW	APPROVED JDW
PROJECT NO. HTL TEST		
DRAWING NO. 381_01		
SHEET 9 OF 18		



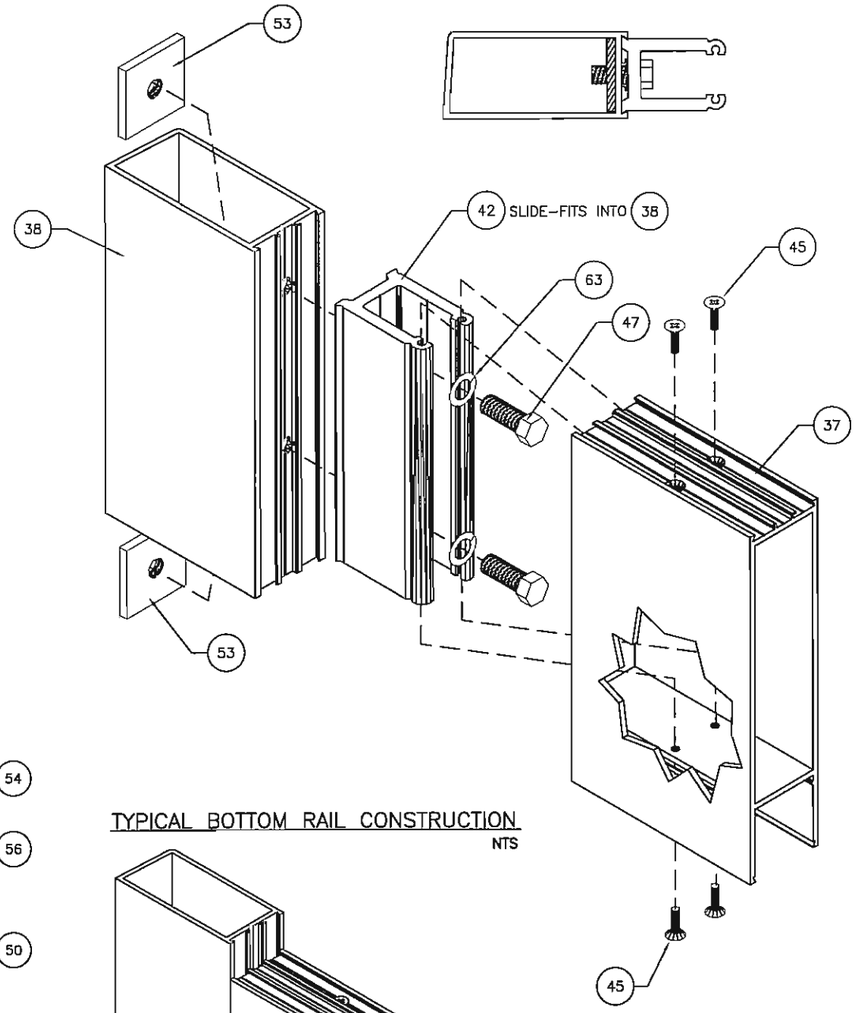
14 – DOOR FRAME HEADER FOR SURFACE CLOSER
1:2



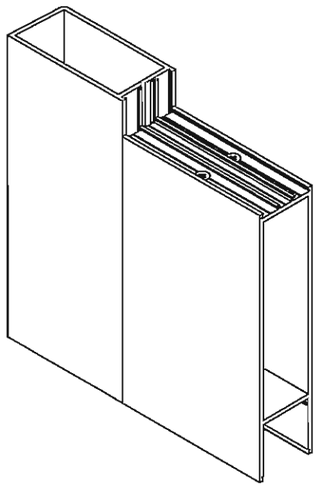
TYPICAL TOP RAIL CONSTRUCTION
NTS



15 – THRESHOLD
1:2



TYPICAL BOTTOM RAIL CONSTRUCTION
NTS



Hurricane Test Laboratory
Tested unless Otherwise Noted
Date 5/2/07
Job # G-402-0305-07

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 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

DOOR AND FRAMING DETAILS

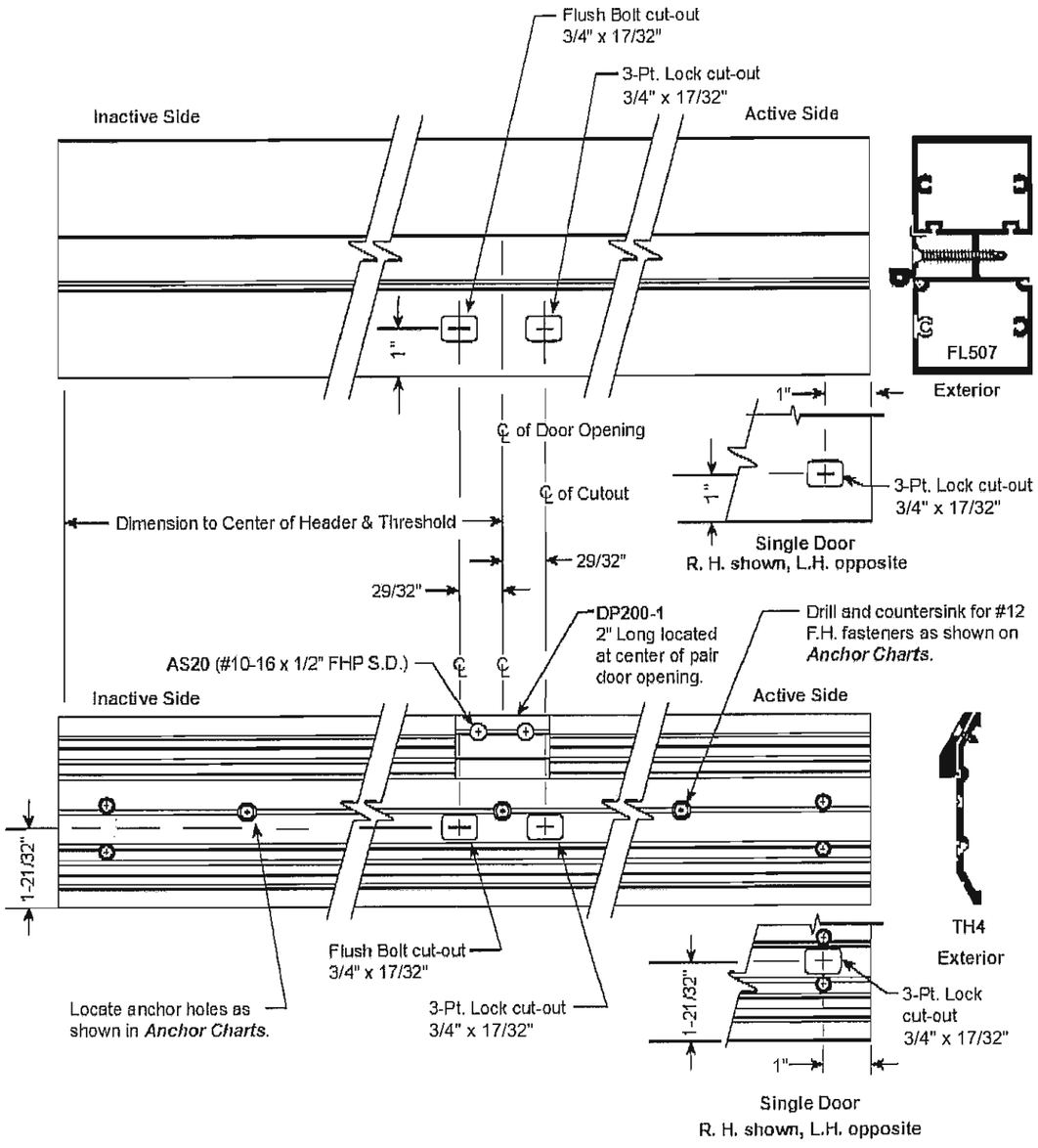
DATE		
4/18/2007		
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST
DRAWING NO. 381_01
SHEET 10 OF 18

FLUSH BOLT & 3 PT. LOCK STRIKE LOCATIONS

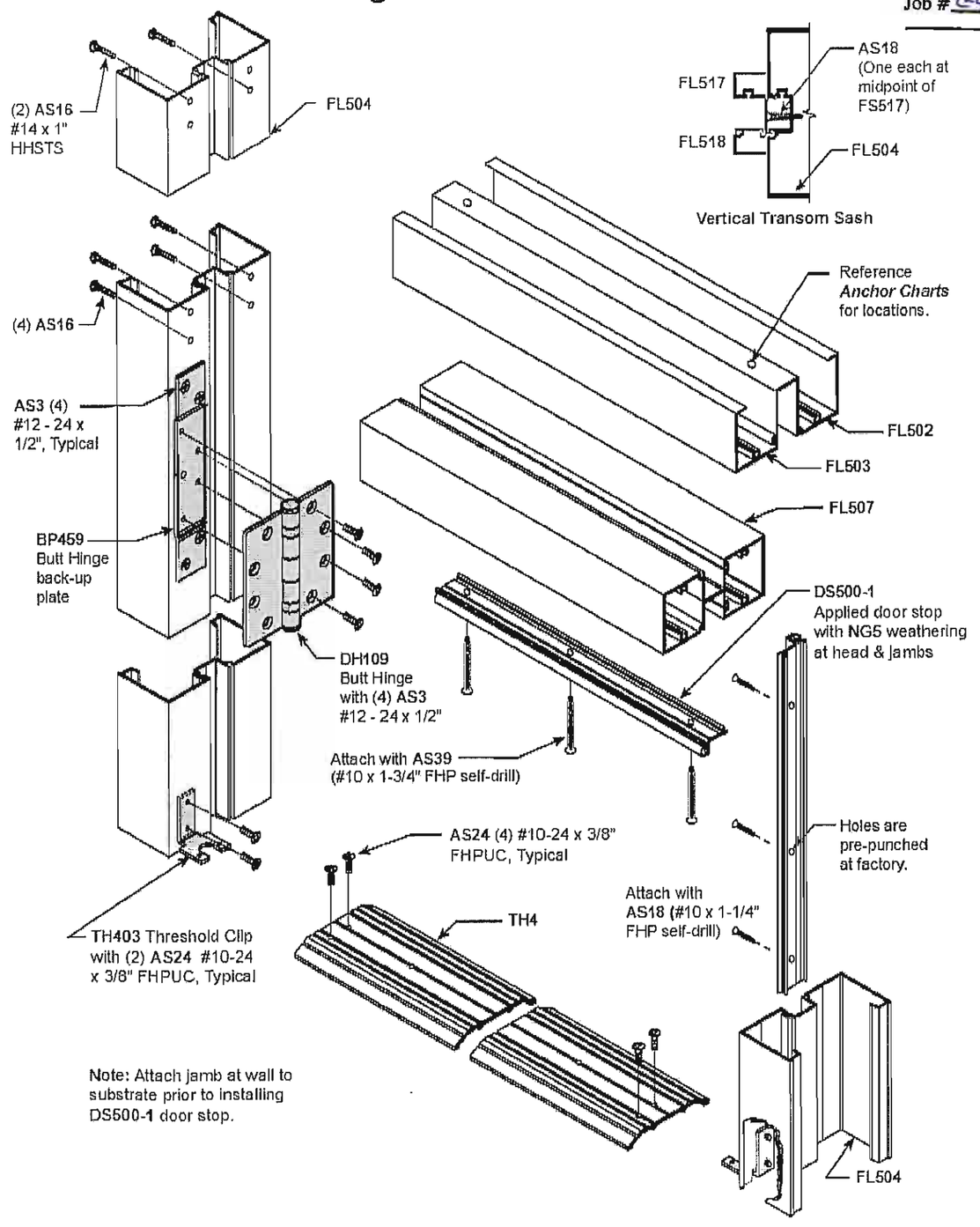
F5 or FT5 Open Back Frame for Butt Hung Door
Surface or Concealed Overhead Closer

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 LLC

Tested unless Otherwise Noted

Date 5/1/07

Job # G-402-0305-07

REV	BY	DATE	DESCRIPTION

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

HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

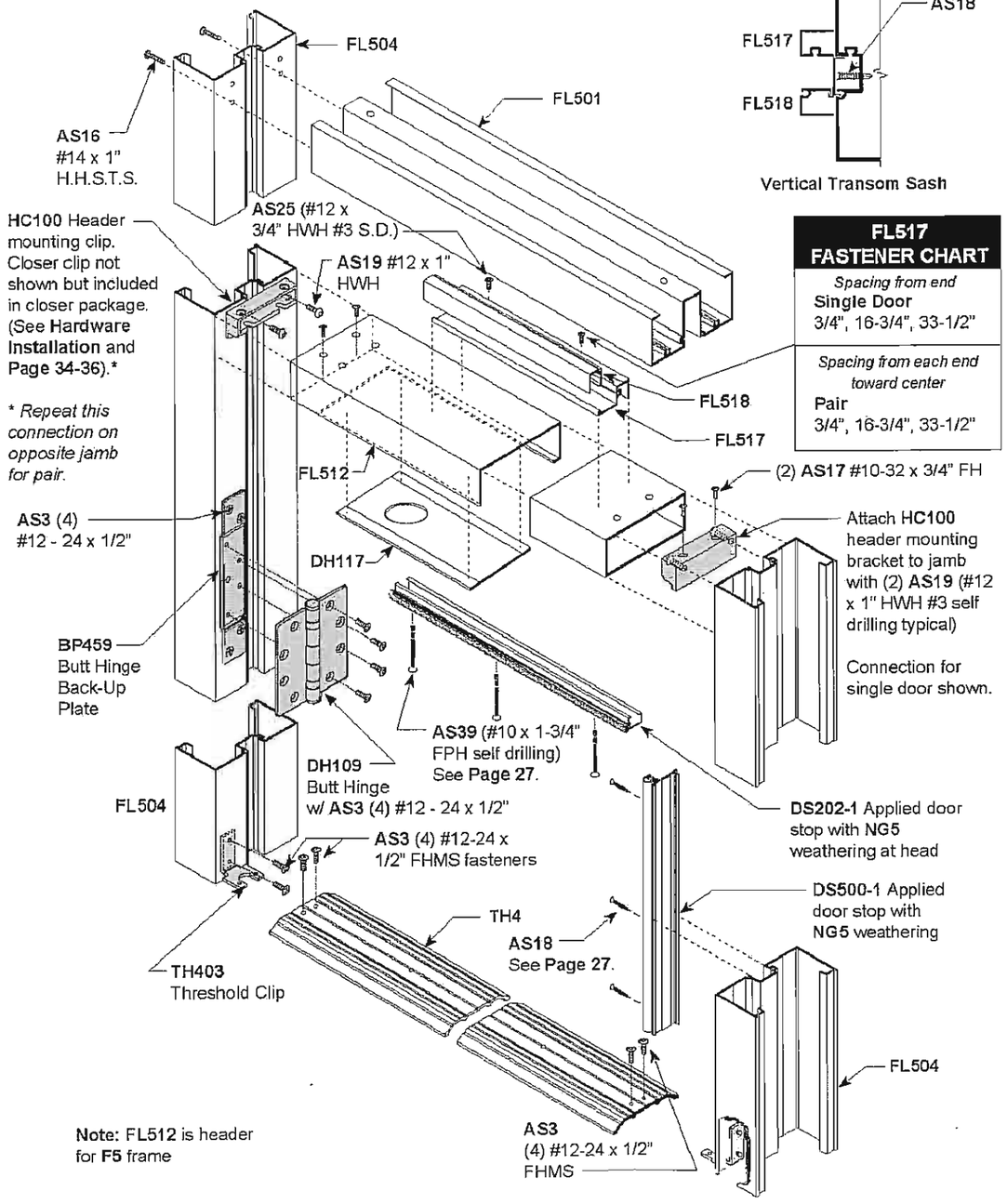
DOOR AND FRAMING DETAILS

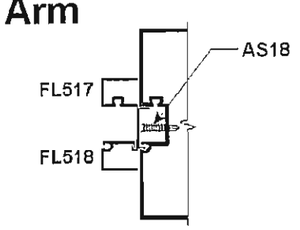
DATE		
4/18/2007		
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

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





Vertical Transom Sash

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 # G402-0505-07

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 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

DOOR AND FRAMING DETAILS

DATE	4/18/2007		
DRAWN	CHECKED	APPROVED	
PCH	JDW	JDW	
PROJECT NO.	HTL TEST		
DRAWING NO.	381_01		
SHEET	12 OF 18		

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
1	NG1	EXTERIOR GLAZING GASKET	.188 SPACE	EPDM	VARIES	
2	NG14	INTERIOR SPACER GASKET	.25 X .188	EPDM	VARIES	
3	SB13	SETTING BLOCK @ SILL & HORIZONTAL	.800 X .688 X 4"	EPDM	VARIES	2 PER LITE
4	SM5601	JOINT SEALANT TAPE	.50 X .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	WD200-1	WATER DIVERTER	1.358 X .594 X .050	PLASTIC	CORAL INDUSTRIES, INC.	USED @ (19)
8	AS16	FASTENER	#14 X 1 HHSTS	STEEL	VARIES	TYPICAL SPLINE SCREW VERTICAL/HORIZONTAL JOINTS
9	AS31	FASTENER	#6 X 3/8" PPH	STEEL	VARIES	ATTACH (13) / ALSO USED @ (28)
10	AS38	FASTENER	#10-24 X3/8 HH	STEEL	VARIES	ATTACH (11) TO (17)
11	SR504	STEEL REINFORCEMENT	4.562 X 1.250 X 0.25	A36 STEEL	VARIES	STEEL REINFORCEMENT FOR (17)
12	CS500-1	SETTING CHAIR	1.156 X .844 X .078	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	2 PER LITE AT SILL
13	ED519-1	SILL FLASHING END DAM	2.50 X 1.00 X .062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	5.00 LONG
14	FL501	HEAD OR WALL JAMB	2.5 X 5.00 X .094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
15	FL502	SILL OR HEAD	2.5 X 4.98X .080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
16	FL503	GLASS STOP	1.25 X 2.021 X .078	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
17	FL504	STD. VERTICAL MULLION/DOOR JAMB	2.5 X 5.00 X .094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
18	FL505	OPEN BACK MULLION FILLER	.681 X 4.67 X .080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
19	FL506	INTERMEDIATE HORIZONTAL	2.5 X 4.98 X .080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
20	FL512	DOOR HEADER	2 X 5.00 X .125	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
21	FL519	SUBSILL FLASHING	2.62 X 5.402 X .084	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
22	SB20	SETTING BLOCK @ INVERTED HORIZONTAL	.800 X .548 X 4"	EPDM	VARIES	2 PER LITE
23	FASTENER	FOR ATTACHING (21) TO CONCRETE SUBSTRATE	#12 X 2" FHP	STEEL	TAPCON	1" MINIMUM EMBEDMENT NON-STRUCTURAL
24	FASTENER	FOR ATTACHING (21) TO WOOD SUBSTRATE	#12 X 2" FHP	STEEL	VARIES	1" MINIMUM EMBEDMENT NON-STRUCTURAL
25	FASTENER	FOR ATTACHING (21) TO STEEL SUBSTRATE	#12 X 2" FHP	STEEL	TEK - VARIES	1" MINIMUM EMBEDMENT NON-STRUCTURAL
26	FL507	DOOR HEADER	2.5 X 4.98 X .080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
27	FL515	FLAT FILLER AT DOOR JAMB	.681 X 4.67 X .080	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	RUNS FULL LENGTH OF DOOR JAMB AT WALL
28	FL517	TRANSOM SASH	1.00 X 1.918 X .062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
29	FL518	TRANSOM GLASS STOP	1.00 X .767 X .062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
30	DS500	DOOR STOP	.648 X 1.260 X .094	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
31	TH4	THRESHOLD	.50 X 4.00 X .125	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
32	DP200-1	PANIC DOOR STOP AT PAIRS	.402 X 1.323 X .188	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
33	DS202-1	DOOR STOP -OFFSET ARM COVER	1.188 X 2.00 X .090	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
34	NG5	BULB GASKET FOR (30)	.260 X SPACE	EPDM	CORAL INDUSTRIES, INC.	
35	D102	DOOR RAIL	4.000 X 1.71 X .120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
36	D106	DOOR- ADJUSTABLE ASTRAGAL	.331 X 1.562 X .062	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
37	D108	DOOR- BOTTOM RAIL	7.5 0 X 1.71 X .120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
38	D110	DOOR -HINGE STILE	3.75 X 1.75 X .120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
39	D111	DOOR- INACTIVE MEETING STILE	3.75 X 1.75 X .120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
40	D112	DOOR- ACTIVE MEETING STILE	3.614 X 1.75 X .120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
41	CB102	DOOR- CORNER BLOCK	2.130 X 1.54 X .25	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	FABRICATED CUT LENGTH = 2.032
42	CB108	DOOR- CORNER BLOCK	2.130 X 1.54 X .25	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	FABRICATED CUT LENGTH = 5.553
43	DG501	DOOR- GLASS STOP- ATTACHED	1.00 X .539 X .100	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
44	DG502	DOOR- GLASS STOP-SNAP-IN	.876 X .539 X .065	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	

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Date 5/1/07
Job # 1-402-0301-07

REV	BY	DATE	DESCRIPTION
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Coral
Architectural Products
3010 RICE MINE ROAD, TUSCALOOSA, AL 35406
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HTL TEST REPORT DRAWINGS FOR
SERIES 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

BILL OF MATERIALS

DATE 4/18/2007

DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

BILL OF MATERIALS

ITEM NO.	P/N	DESCRIPTION	DIMENSIONS	MATERIAL	MANUFACTURER	NOTES
45	AS1	FASTENER	# 10 X 3/4" FHP	STEEL	VARIES	
46	AS17	FASTENER	# 10-32 X 3/4"	STEEL	VARIES	
47	AS4	CAP BOLT	3/8"-16 X 3/4" HWH	STEEL	VARIES	
48	BP380	FLUSH BOLT GUIDE	1.475 X 3.062 X .180	STEEL	CORAL INDUSTRIES, INC.	USED @ INACTIVE STILE
49	AS7	FASTENER	#8 X 3/4" POH S.D.	STEEL	VARIES	ATTACH (36) TO (40)
50	AS18	FASTENER	#10 X 1-1/4" FHP	S. STEEL	VARIES	
51	AS20	FASTENER	#10-16 X 1/2" FHP	STEEL	VARIES	ATTACH (32) TO (31)
52	AS39	FASTENER	#10 X 1-3/4" FHP S.D.	S. STEEL	VARIES	MIDPOINT AND 10" FROM EACH END
53	AS13	SQUARE NUT	1.475 X 1.475 X .180	ZINC PLATED STEEL	CORAL INDUSTRIES, INC.	
54	CB109	DOOR- CORNER BLOCK	2.130 X 1.54 X .25	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	FABRICATED CUT LENGTH = 7.513
55	DB122-1	CHANNEL SPACER FOR OFFSET ARM	.406 X 1.455 X .090	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	CUT 12" LONG
56	D109	BOTTOM DOOR RAIL	9.500 X 1.71 X .120	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	
57	NG13	SPACER GASKET FOR (43)	.201 X .288	EPDM	VARIES	
58	SB11	DOOR-SETTING/ EDGE BLOCK	.319 X .523 X 4"	EPDM	VARIES	
59	WS100	DOOR SWEEP	.812 X .302 X .125	6063-T6 ALUM.	CORAL INDUSTRIES, INC.	CUT TO DOOR OPENING WIDTH (LESS CLEARANCE)
60	WP106	WEATHERING- (36) ADJUSTABLE ASTRAGAL	VARIABLE SPACE	WOOL PILE	VARIES	DOUBLE ROW- FULL LENGTH OF ASTRAGAL
61	VG1	WEATHERING FOR (59)	1.142 X .120 X .06	SOFT VINYL	CORAL INDUSTRIES, INC.	CUT TO DOOR OPENING WIDTH (LESS CLEARANCE)
62	CS501-1	GLASS STOP CLIP	.178 X .769 X .068	6063-T6 ALUMINUM	CORAL INDUSTRIES, INC.	USED WITH (43)
63	AS41	3/8" LOCK WASHER	0.377 X 0.141 X 1.094	STEEL	VARIES	
64	TH403	THRESHOLD CLIP	1.90 X 1.909 X .126	STEEL	VARIES	
65	SP100	ADJUSTABLE ASTRAGAL SPRING	1.055 X 0.485 X 0.055	S. STEEL	CORAL INDUSTRIES, INC.	USED @ (36) WITH (49)
66	AS15	FASTENER	#8 X 1-1/4" FHP TEK	STEEL	VARIES	ATTACH (55) TO (35)

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Job # L-402-0307-07

REV	BY	DATE	DESCRIPTION
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PHONE: 800-772-7737 FAX: 800-255-7320

HTL TEST REPORT DRAWINGS FOR
SERIES 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

BILL OF MATERIALS

DATE 4/18/2007

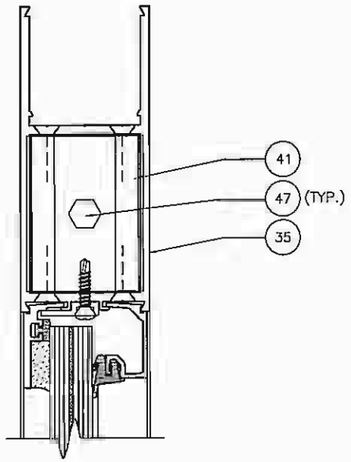
DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

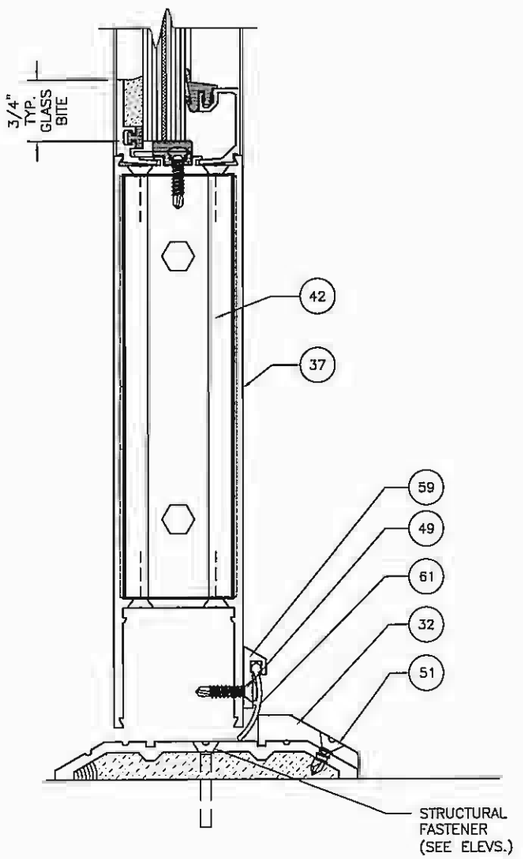
SHEET 14 OF 18

GLAZING SCHEDULE



B = 1/4" NOMINAL GLASS THICKNESS

U = 1/4" NOMINAL GLASS THICKNESS



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

GLASS TYPES				
GLASS MARK SYMBOL	GLASS TYPE	MANUFACTURER	MAXIMUM D.L.O. SIZE	MAXIMUM SQUARE FEET
B	9/16" NOMINAL OVERALL THICKNESS LAMINATED GLASS SOLUTIA "SAFLEX" CONSISTING OF TWO 1/4" HS GLASS, AND A 0.090" SOLUTIA "SAFLEX" PVB INTERLAYER N.O.A. = 03-0105.02	SOLUTIA	81 11/16" x 32 5/16"	18.3
U	9/16" NOMINAL OVERALL THICKNESS LAMINATED GLASS CONSISTING OF TWO 1/4" HS GLASS, AND A 0.120" UVEKOL "S" INTERLAYER N.O.A. = 03-1117.05	UVEKOL	81 11/16" x 32 5/16"	18.3
A	1/4" H.S. AT INNER/OUTER FACES W/0.075 SOLUTIA VS02 INTERLAYER N.O.A. = 03-0514.15	SOLUTIA	19 3/8" x 82"	11.0

Hurricane Test Laboratory

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Date 5/4/07

Job # G602-0305-07

REV	BY	DATE	DESCRIPTION
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HTL TEST REPORT DRAWINGS FOR
SERIES 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

GLAZING SCHEDULE

DATE	4/18/2007	
DRAWN PCH	CHECKED JDW	APPROVED JDW
PROJECT NO.	HTL TEST	
DRAWING NO.	381_01	
SHEET	15 OF 18	

HARDWARE SCHEDULES

FLORIDA PRODUCT APPROVAL					DOOR MARK	DOOR: # TYPICAL		ELEV: E1
IMPACT	X	NOA			DOOR SIZE	7'-0 X 8'-0" PAIR		
		DOOR HINGING			LOCKING DEVICE		MANUFACTURER	NOTES:
DOOR TYPE		B.H.	C.G.H.	O.P.	DH072-96	X	VARIES	3 POINT LOCK
SERIES 381		X	▼	▼	EXIT DEVICES:		SERIES	NOTES:
					JACKSON	▼	2086	CVR PANIC

HARDWARE DESCRIPTION	PART NUMBER	QTY	MANUFACTURER	USED
CLOSER - SURFACE MOUNTED	CL026	0	HAGER	X
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	PH1-10	1	CORAL	X
PUSH BAR	PB1-39	1	CORAL	X
CYLINDER (ACTIVE)	DH078	1	VARIES	X
THUMB TURN (ACTIVE) OPTIONAL	DH079	1	VARIES	X
CYLINDER (ACTIVE) FOR VON DUPRIN EXIT	DH081 (RIM CYLINDER)	0	VARIES	▼
LOCK (ACTIVE)	DH072-96 (3-PT. LOCK)	1	VARIES	X
LOCK INDICATOR (ACTIVE) OPTIONAL	DH074	0	VARIES	▼
FLUSH BOLT (INACTIVE)TOP/BTM 84" DOOR	DH176	1	VARIES	X
FLUSH BOLT (INACTIVE)TOP ONLY 96" DOOR	DH176-96	1	VARIES	X
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

FLORIDA PRODUCT APPROVAL					DOOR MARK	DOOR: # TYPICAL		ELEV: E2
IMPACT	X	NOA			DOOR SIZE	7'-0 X 8'-0" PAIR		
		DOOR HINGING			LOCKING DEVICE		MANUFACTURER	NOTES:
DOOR TYPE		B.H.	C.G.H.	O.P.	DH072-96	▼	VARIES	3 POINT LOCK
SERIES 381		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	2	JACKSON	X
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

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HTL TEST REPORT DRAWINGS FOR
SERIES 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

HARDWARE SCHEDULES

DATE 4/18/2007

DRAWN	CHECKED	APPROVED
PCH	JDW	JDW

PROJECT NO. HTL TEST

DRAWING NO. 381_01

HARDWARE SCHEDULES

FLORIDA PRODUCT APPROVAL					DOOR MARK		DOOR: # TYPICAL	ELEV: E3
IMPACT	X	NOA			DOOR SIZE		7'-0 X 8'-0" PAIR	
		DOOR HINGING			LOCKING DEVICE		MANUFACTURER	NOTES:
DOOR TYPE		B.H.	C.G.H.	O.P.	DH072-96	X	VARIES	3 POINT LOCK
SERIES 381		X	▼	▼	EXIT DEVICES:		SERIES	NOTES:
					JACKSON	▼	2086	CVR PANIC

HARDWARE DESCRIPTION	PART NUMBER	QTY	MANUFACTURER	USED
CLOSER - SURFACE MOUNTED	CL026	0	HAGER	X
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	PH1-10	1	CORAL	X
PUSH BAR	PB1-39	1	CORAL	X
CYLINDER (ACTIVE)	DH078	1	VARIES	X
THUMB TURN (ACTIVE) OPTIONAL	DH079	1	VARIES	X
CYLINDER (ACTIVE) FOR VON DUPRIN EXIT	DH081 (RIM CYLINDER)	0	VARIES	▼
LOCK (ACTIVE)	DH072-96 (3-PT. LOCK)	1	VARIES	X
LOCK INDICATOR (ACTIVE) OPTIONAL	DH074	0	VARIES	▼
FLUSH BOLT (INACTIVE)TOP/BTM 84" DOOR	DH176	1	VARIES	X
FLUSH BOLT (INACTIVE)TOP ONLY 96" DOOR	DH176-96	1	VARIES	X
PANIC STOP	DP200-2	1	CORAL	X
THRESHOLD	TH4	1	CORAL	X
DOOR BOTTOM SWEEP	WS142	2	CORAL	X

NOTES:

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REV	BY	DATE	DESCRIPTION
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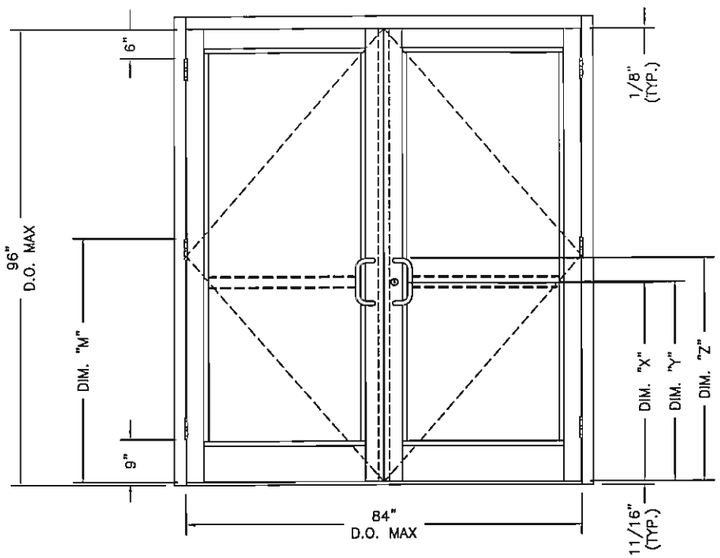
HTL TEST REPORT DRAWINGS FOR
SERIES 381 HURRICANE IMPACT-RESISTANT
DOORS WITH MULTIPLE GLAZING INFILLS
AND HARDWARE OPTIONS

HARDWARE SCHEDULES

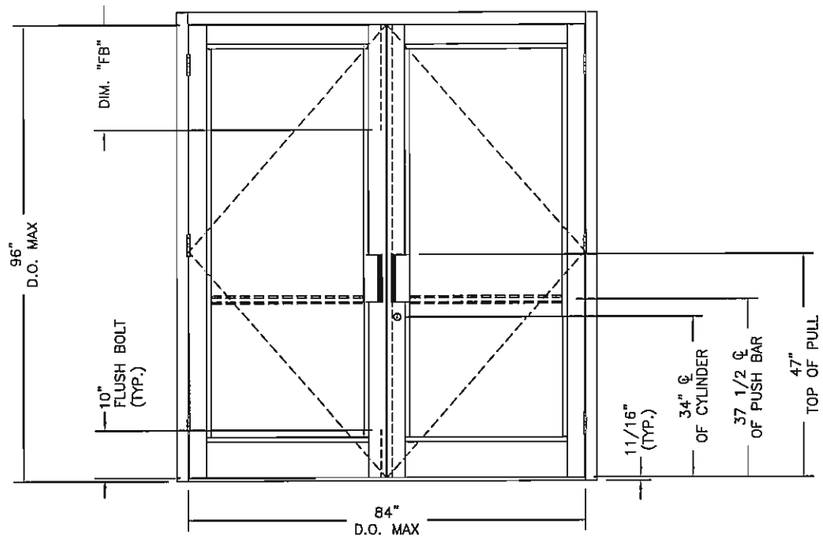
DATE	4/18/2007
DRAWN / CHECKED / APPROVED	PCH / JDW / JDW
PROJECT NO.	HTL TEST
DRAWING NO.	381_01
SHEET	17 OF 18

STANDARD HARDWARE LOCATIONS
FOR SERIES 381 ENTRANCE DOORS
WITH 1-1/2 PAIR BUTT HINGES



INTERMEDIATE HINGE LOCATION	
D.O. HEIGHT	DIM. "M" BUTT HUNG
84"	45–11/32"
96"	51–11/32"

STANDARD HARDWARE LOCATIONS

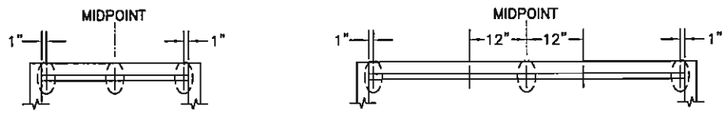


FLUSH BOLT LOCATIONS

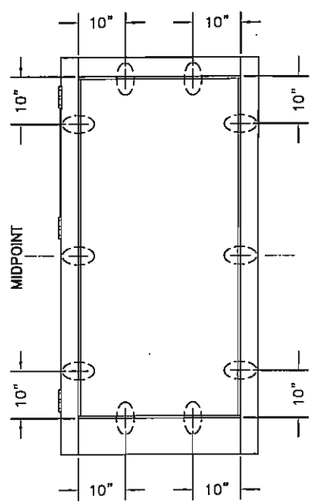
P/N	DESCRIPTION	DIM "FB"
DH176–96	TOP FLUSH BOLT (FOR 96" TALL DOOR)	22"
DH176	TOP FLUSH BOLT (FOR 84" TALL DOOR)	10"
	BOTTOM FLUSH BOLT (FOR 84"/ 96" TALL DOOR)	10"

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"

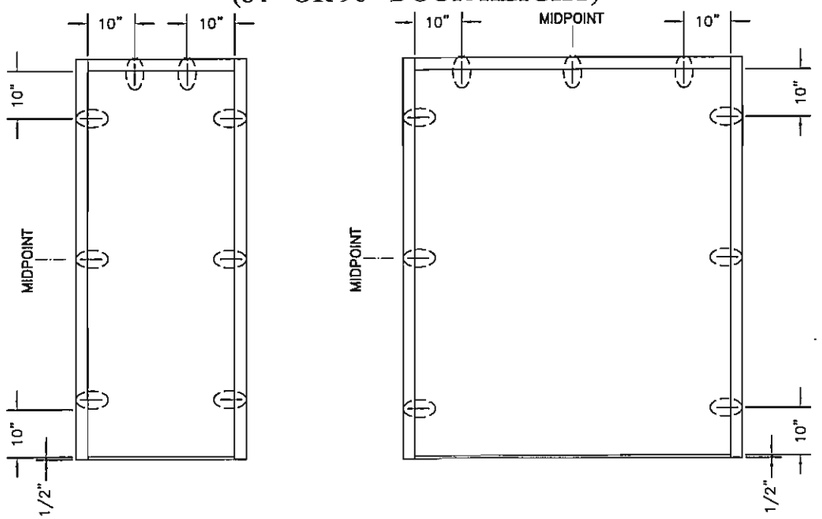
ATTACHMENT LOCATIONS FOR DS202-1 DOOR STOP AT HEADER



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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HTL TEST REPORT DRAWINGS FOR SERIES 381 HURRICANE IMPACT-RESISTANT DOORS WITH MULTIPLE GLAZING INFILLS AND HARDWARE OPTIONS

HARDWARE LOCATIONS

DATE 4/18/2007
DRAWN PCH | CHECKED JDW | APPROVED JDW
PROJECT NO. HTL TEST
DRAWING NO. 381_01
SHEET 18 OF 18