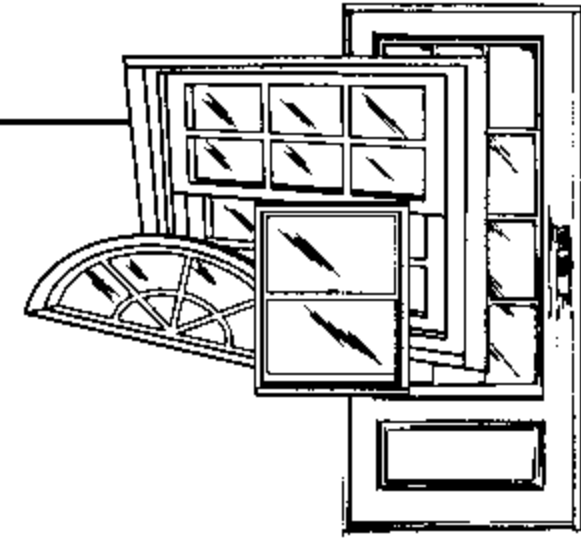


# CERTIFIED TESTING LABORATORIES

Architectural Division • 7252 Narcoossee Rd. • Orlando, FL 32822  
(407) 384-7744 • Fax (407) 384-7751  
Web Site: wwwctlarch.com  
E-mail: ctlarch.com



**Report No.:** CTLA746W1

DC Not. No. CTL-01035

Date: October 11, 2001

CTL Certification # 99-0105.02

Test Dates: September 18 - 25, 2001

**Test Requested By -** MESKER  
3440 Stanwood Blvd.  
Huntsville, AL 35811-9021  
Phone 256-851-6670      Facsimile 256-851-7896

**Tests Conducted:** PA 201, PA 202 & PA 203 (with no deviations)

**Design Pressures -**

Specimens 1 & 2	(PA 202)	Out-swing	+ 80.0 psf.	- 80.0 psf.
Specimens 1-I, 2-I & 3-I	(PA 201 & 203)	Out-swing	+ 80.0 psf.	- 80.0 psf.

## (1) DESCRIPTION OF SERIES:

**Model Designation -** Commercial OS Opaque Flush Steel Door in a Hollow Metal Steel Frame

**Overall Size -** All Specimens (Out-swing Bump Threshold) 76.0" wide x 86.0" high x 5.75" deep

**Configuration -** All Specimens      **XX**

**No. & Size of Doors -** All Specimens (opaque flush door panel)

(1) active	35.75" wide x 83.063" high
(1) inactive	35.75" wide x 83.063" high with z-astragal

*Handwritten signature:* K. L. P. E.  
10/15/01

## **(2) MATERIAL CHARACTERISTICS:**

**Frame and Door Material** – 16ga. (.053" min.) cold rolled brake press formed steel jambs and 16ga. (.053" min.) cold rolled steel door face sheet.

### **Frame Construction:            Steel Hollow Metal Jamb**

The head and side jambs are a one-piece brake press formed steel frame from 16ga. (0.053") cold rolled steel (stated by mfg.) measuring 5.75" x 2.625". The corners of both the header and side jambs are mitered, butted and seam welded. The header has slots punched in both return legs for the 18ga. (0.0625") frame tabs that are welded to the side jambs (FT001). The tabs are bent 90° over the header after being slipped through the slots to create a mechanical joint. Each hinge location has a 7ga. (0.175") steel 1.40" wide x 8.0" steel hinge reinforcement (PF4HR) welded to the frame. Each hinge location also has a mortar guard 1.625" x 4.875" x 0.040" thick steel welded to the back of the hinge reinforcement. The each side jamb has a 16 ga. (0.053") steel "L" shaped floor anchor plate (PFSA5) measuring 1.5" wide floor side x 1.75" wide frame side x 5" long welded to the inside bottom of the frame. The anchor was not secured to the buck during these tests. All specimens used an extruded Aluminum Out-swing Bump threshold measuring 1.0" high x 3.5" deep manufactured by National Guard Products (part no. 891V). Secured to steel "C"-channel sill measuring 8.0" x 2.260" x .220" web with four (4) 1/4"-20 x 2" Phillips flat head machine screws located 5", 15", 25", and 35" measuring from right jamb.

### **Panel Construction:            Steel Flush Door Panel**

The panel is constructed from 16ga. (0.053" min.) cold rolled steel face sheet with 16ga. (.053" min.) steel top and bottom closers (PDBC30) measuring 1.625" wide x .718" deep x 35.25" long. The interior cavity of each door is filled with expanded polystyrene (EPS). The face sheets are glued to the EPS. The top and bottom edges of the face sheets are flush with each other and the door top and bottom closer. The door top and bottom closers are then spot welded to the face sheets at a maximum of 3.0" on center the full width of the door panel. The face sheet pan has a 90° x 1.0" return leg turning back into the center of the panel along both vertical edges. The pan has a blanked hole every 3.0" along the return leg. The lid has a 180° x 1.0" return leg brake formed back on it's self along both vertical edges. The lid has punched tab every 3.0" along it's return leg. The lid is placed on the pan and the tabs are slid into the punched holes of the pan to create a mechanical lock. The pan and lid are then stitch welded the full length of both vertical edges. The door has three steel hinge reinforcements welded on the pan before the pan and lid are assembled, located at 9.25", 41.5" and 73.75" from the top of the door to the center of each hinge. The top hinge reinforcement (PDNLHR 450) measures 1.25" x 11.25" x 7ga. hot rolled steel. The middle and bottom hinge reinforcements (PDNHR 450) measure 1.25" x 8" x 7ga. hot rolled steel. Specimen 1, 1-I & 2-I active panels utilized a cylindrical lock box (PDCLB) reinforcement at the latch and deadbolt locations in the interior cavity. The remaining specimens active panels utilized a mortise lock box (PDMLB) reinforcement to receive the mortise locks. All inactive door panels utilized a blank mortise lock box (PDMLBB) reinforcement at the strike location. The lock boxes are welded to the pan return leg prior to the assembly of the pan and lid. Each inactive door panel has a Commercial Z-Astragal measuring 1.944" x 1.803" x .082" thick cold rolled steel spot welded at a maximum of 3.0" apart to the strike side the entire length of the door panel. Each inactive panel has a 14ga. cold rolled steel welded steel I-beam (LA-1482) welded to the interior cavity 1.0" from the strike side the full length of the panel.

*W. J. L. P. E.*  
*10/15/01*

**(2) MATERIAL CHARACTERISTICS: Cont.**

**Glazing:** N / A

**Glazing Material** – N / A

**Glazing Method** – N / A

**Daylight Opening** - N / A

**Weather-stripping** –

- All Specimens (1) row at the sill National Guard vinyl bulb  
(1) row length of each leg jamb Pemko S88D Silicone stick on type  
(1) row length of head jamb Pemko S88D Silicone stick on type  
(1) row length of Commercial Z-Astragal Pemko S88D Silicone stick on type

**Hardware** -

- Specimens 1, 1-I & 2-I (1) Corbin/Ruswin CL3300 Series Heavy Duty Lever Lockset  
(Located @ 39.5" from bottom of the door panel)  
(1) Corbin/Ruswin DL3000 Series Cylindrical Dead Lock  
(Located @ 47.5" from bottom of the door panel)
- Specimens 2 & 3-I (1) Corbin/Ruswin ML2000 Series Mortise Lock W/Lever Handle  
(Located @ 39.0" from bottom of the door panel)
- All Specimens (6) 4.5" x 4.5" Template hinges by Hager (0.135" thick)  
(Located @ 7.0", 39.25" and 71.5" from top of door panel to top of hinge)
- All Specimens (1) 8.0" long surface bolt by Hager, 275D (top of inactive panel)  
(1) 12.0" long surface bolt by Hager, 276D (bottom of inactive panel)  
Each surface bolt attached to panel with four (4) .375" x 1.5" L. Sexbolts.

**Weepholes** - None

**Muntins** - None

**Reinforcement** - The hinge locations in the door panel and on the frame were reinforced with 7 ga. steel reinforcement. The strike and deadbolt location on the door panel is reinforced with 14 ga. lock box reinforcement. The inactive panel has an internal welded I-beam running vertically top to bottom, on the strike side.

**Sealant** - Silicone caulking as needed to seal unit into test buck.

**Additional Description** -

All specimens were installed in a concrete block test buck with a steel C-channel for the test buck bottom.

*by [Signature] P.E.  
10/15/01*

### (3) INSTALLATION:

#### Screws and Method of Attachment –

##### Specimens 2 and 2-I

These specimens were installed in an existing masonry buck. The CMU block was laid on a steel “C” channel to form a rough opening of 76.0 x 86.0”. The hollow metal frame was punched and dimpled to receive a tapcon type screw with a 0.625” head and was secured to the block as follows:

(10) 3/8" x 5" Phillips Flat Head zinc plated Powers Tapper screws, (10) butterfly reinforcements

(4) 3/8" x 5" screws located @ 4.125", 28.0", 50.0" and 72.0" from the bottom of both hinge jambs.

(2) 3/8" x 5" screws located @ 32.0" from each outside corner of the header.

(7) 1/4-20 x 2.0" Phillips Flathead machine screw at the threshold located @ 6.5", 19.25", 32.0", 37.937", 44.75", 57.5" and 70.25" from the left outside edge of jamb.

##### Specimens 1, 1-I and 3-I

These specimens were installed in a new masonry buck. The CMU block was laid on a steel “C” channel to form a rough opening of 76.0" x 86.0". The hollow metal frame was set in place as the CMU block was laid. The Tee anchors were fitted into the hollow metal frame and back filled with mortar as follows:

(10) 0.09375" thick steel "T" anchors

(5) "T" anchors located @ 7.75", 23.75", 39.75", 55.75" and 71.75" from the bottom of both hinge jambs.

(7) 1/4-20 x 2.0" Phillips Flathead machine screw at the threshold located @ 6.5", 19.25", 32.0", 37.937", 44.75", 57.5" and 70.25" from the left outside edge of jamb.

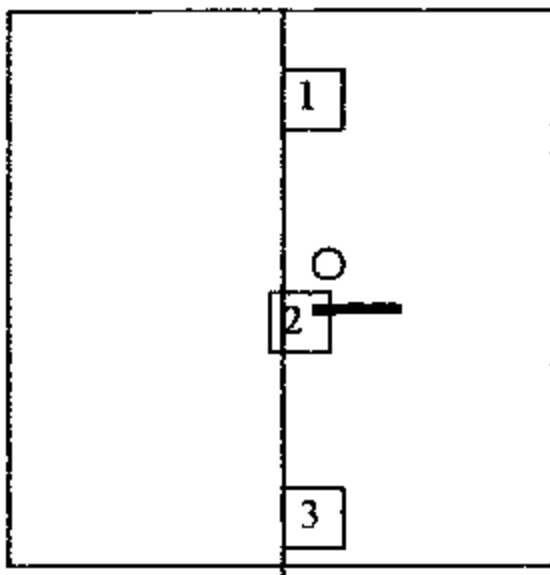
*W. J. Lohb P.E.*  
*10/15/01*

**(4) SEQUENCE OF TESTS PERFORMED:**

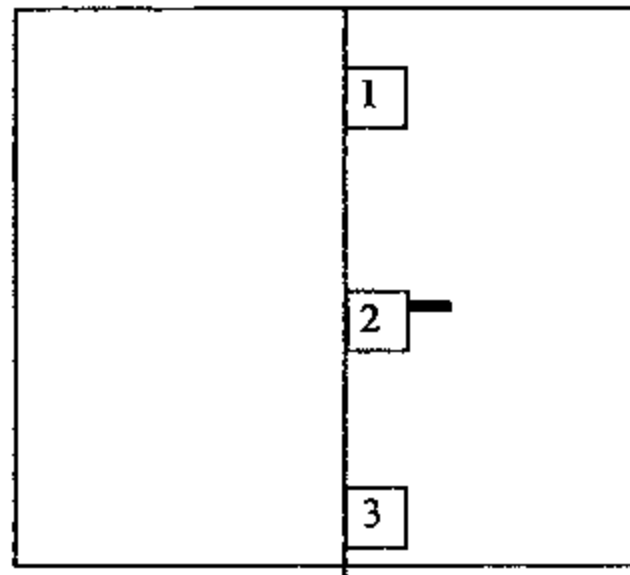
**Test Results:**

**Test Sequence: PA 202**

1. Air Infiltration
2. 1/2 Test Pressure Positive
3. 1/2 Test Pressure Negative
4. Design Pressure Positive
5. Design Pressure Negative
6. Water Infiltration Positive Direction
7. Full Test pressure Positive
8. Full Test Pressure Negative
9. Forced Entry



**XX**  
 Spec 1  
 Cyl. Lever Lock  
 w/Deadbolt



**XX**  
 Spec 2  
 Mortise Lever  
 Lock

Deflection was measured with three (3) CDI 5" dial indicators: location #1-SN 971649614, location #2-SN 980369793 & location #3-SN 011732155

**AIR INFILTRATION**

Air Infiltration Tests were conducted in accordance with DCBCCD PA 202-94

Air at 1.57 psf		Actual	Allowable
Specimen 1	Out-swing	0.32 CFM/SQ FT	0.50 CFM/SQ FT

**WATER INFILTRATION TEST**

Water Infiltration Test was conducted in accordance with DCBCCD PA 202 – 94

Specimen 1	Out-swing	Water @ 6.0 psf for 15 min.	No water penetration over sill.
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*Low Infiltration  
 10/15/01*

**STATIC AIR PRESSURE TESTS**

Static Tests were conducted in accordance with DCBCCD PA 202-94

**Design Loads + 80.0 psf, - 80.0 psf. Specimen 1 (out-swing - lever lock w/deadbolt)**

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	60.0		
Design	30	80.0		
Test	30	120.0	Door T (1) 0.375" Door B (2) 0.474"	0.014" 0.042"
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	60.0		
Design	30	90.0		
Test	30	120.0	Door T (1) 1.031" Door B (2) 1.242"	0.172" 0.150"

- (1) Door T - Max. allowable perm. set at test load (0.4% of span)  $.004 \times 83.063 = 0.332"$
- (2) Door B - Max. allowable perm. set at test load (0.4% of span)  $.004 \times 83.063 = 0.332"$

**Design Loads + 80.0 psf, - 80.0 psf. Specimen 2 (out-swing - Mortise Lock)**

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	60.0		
Design	30	80.0		
Test	30	120.0	Door T (1) 0.368" Door B (2) 0.430"	0.269" 0.043"
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	60.0		
Design	30	80.0		
Test	30	120.0	Door T (1) 0.890" Door B (2) 0.840"	0.140" 0.150"

- (1) Door T - Max. allowable perm. set at test load (0.4% of span)  $.004 \times 83.063 = 0.332"$
- (2) Door B - Max. allowable perm. set at test load (0.4% of span)  $.004 \times 83.063 = 0.332"$

*Handwritten signature: [Signature] P.E.  
10/15/07*

### STATIC AIR PRESSURE TESTS      **Cont.**

Static Tests were conducted in accordance with DCBCCD PA 202-94

### FORCED ENTRY TEST

Forced Entry tests were conducted in accordance with DCBCCD PA 202-94.

<u>Specimen</u>	<u>Size</u>	<u>Time</u>	<u>Result</u>
Specimen 1	76.0" wide x 86.0" high	30 seconds	(Door remained locked and shut)
Specimen 2	76.0" wide x 86.0" high	30 seconds	(Door remained locked and shut)

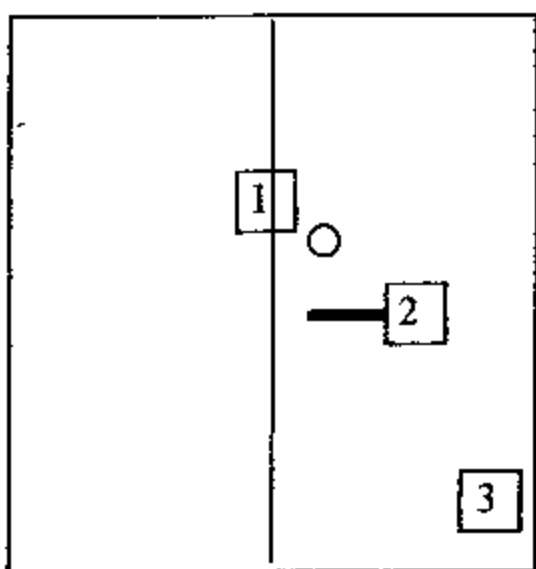
### IMPACT TEST – LARGE MISSILE

Impact tests were conducted in accordance with DCBCCD PA 201-94.

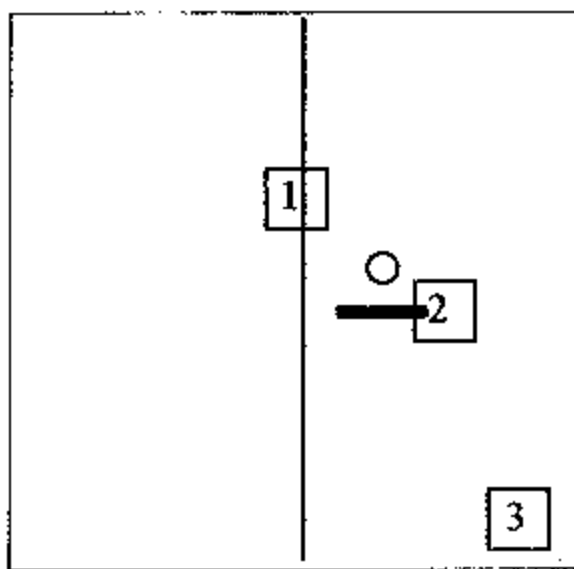
#### Note:

X measurement from right edge of door panel  
Y measurement from top edge of door panel.

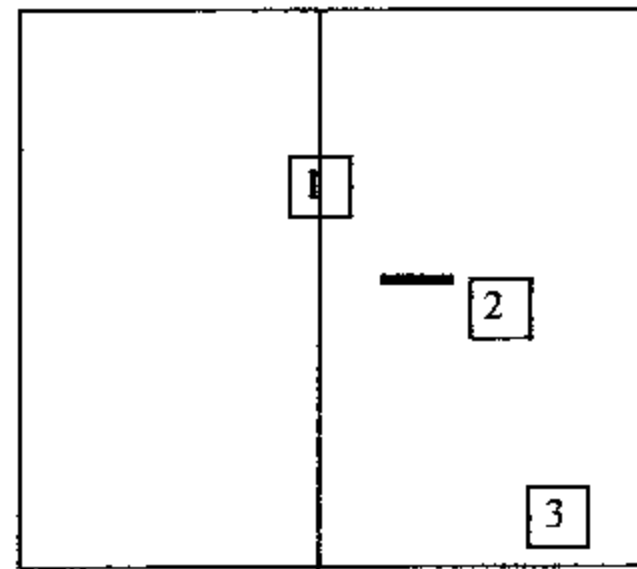
Type and weight of missile: # 2 Southern Yellow Pine 2x4, Length approx. 89-5/16" & 9 lb.



XX  
Spec 1-I  
Cyl. Lever Lock  
w/Deadbolt



XX  
Spec 2-I  
Cyl. Lever Lock  
w/Deadbolt



XX  
Spec 3-I  
Mortise Lever  
Lock

*Lab. P.E.  
10/15/01*

**IMPACT TEST – LARGE MISSILE**

**Cont.**

**Specimen 1-I (out-swing - lever lock w/deadbolt)**

Impact No.	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas.
1.	1	50.1	37.5"	26.0"
2.	2	50.0	57.0"	44.0"
3.	3	50.2	68.0"	80.0"

None of the impacts penetrated the specimen and all locks remained engaged.

**Specimen 2-I (out-swing – lever lock w/deadbolt)**

Impact No.	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas.
1.	1	50.0	27.5"	37.5"
2.	2	50.2	43.0"	57.0"
3.	3	50.2	77.0"	68.0"

None of the impacts penetrated the specimen and all locks remained engaged.

**Specimen 3-I (out-swing – Mortise Lock)**

Impact No.	Impact Loc.	Speed Ft/Sec.	X Meas.	Y Meas
1.	1	50.1	28.5"	37.0"
2.	2	50.1	44.5"	58.0"
3.	3	50.0	78.5.0"	69.0"

None of the impacts penetrated the specimen and all locks remained engaged.

*W. J. ... P. E.  
10/15/01*

**FATIGUE LOADING TEST**

Cycle tests were conducted in accordance with DCBCCD PA 203

**Specimen 1-I (out-swing - lever lock w/deadbolt)**

**Design Load psf = + 80.0 psf, - 80.0 psf**

**Positive loads**

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	40.0 PSF	52
+ .0 to 0.6	70	48.0 PSF	52
+ .0 to 1.3	1	104.0 PSF	

671 cycles completed

**Negative Loads**

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
- .0 to 0.5	600	40.0 PSF	52
- .0 to 0.6	70	48.0 PSF	52
- .0 to 1.3	1	104.0 PSF	

671 cycles completed

**Specimen 2-I (out-swing - lever lock w/deadbolt)**

**Design Load psf = + 80.0 psf, - 80.0 psf**

**Positive loads**

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	40.0 PSF	52
+ .0 to 0.6	70	48.0 PSF	52
+ .0 to 1.3	1	104.0 PSF	

671 cycles completed

**Negative Loads**

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
- .0 to 0.5	600	40.0 PSF	52
- .0 to 0.6	70	48.0 PSF	52
- .0 to 1.3	1	104.0 PSF	

671 cycles completed

Specimens 1-I and 2-I showed no resultant failure or duress after cycle test. No failure of fasteners. Locks remained engaged. The door was operable at the end of the test.

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10/15/19

**FATIGUE LOADING TEST**      **Cont.**

Cycle tests were conducted in accordance with DCBCCD PA 203

**Specimen 3-I (out-swing – Mortise Lock)**

**Design Load psf = + 80.0 psf, - 80.0 psf**

Positive loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	40.0 PSF	52
+ .0 to 0.6	70	48.0 PSF	52
+ .0 to 1.3	1	104.0 PSF	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
- .0 to 0.5	600	40.0 PSF	52
- .0 to 0.6	70	48.0 PSF	52
- .0 to 1.3	1	104.0 PSF	

671 cycles completed

Specimens 3-I showed no resultant failure or duress after cycle test. No failure of fasteners. Locks remained engaged. The door was operable at the end of the test.

**(5) DRAWINGS TO BE SUBMITTED:**

1. L-2168 sheets 1 through 11
2. Mesker Part Drawings
3. Corbin/Ruswin CL3300 Lock sheet
4. Corbin/Ruswin DL3000 Lock sheet
5. Corbin/Ruswin ML2000 Lock sheet
6. CTL Anchor Diagram CTL-0002 and CTL-0002A

**Comment:** Nominal 2 mil polyethylene film was used to seal against air leakage during structural loads. The film was used in a manner that did not influence the test results.

**Remarks:** The results obtained and reported apply only to the specimens tested.

Detailed drawings were available for laboratory records and comparison to the test specimen at the time of this report. A copy of this report along with representative sections of the test Specimen will be retained by CTL for a period of ten (10) years. The results obtained apply only to the specimen tested.

This test report does not constitute certification of this product, but only that the above test Results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Certified Testing Laboratories assumes that all information provided by the client is accurate and that the physical and chemical properties of the components are as stated by the manufacturer.

*Handwritten signature:*   
\_\_\_\_\_  
10/15/01

**Observers:**

Steve Frates -  
Tim Jarvis - Vice President, Engineering  
Rick Wright – Consultant, R.W. Building Consultants, Inc.

**Dade County Witness:**

Not present

**All Tests Witnessed by:**

Ramesh Patel P.E.  
Chris Bennett CTL  
Jay Donahou CTL



Ramesh Patel, P. E.  
Florida Reg # 20224

**Certified Testing Laboratories, Inc.**



Christopher Bennett  
Laboratory Manager  
Architectural Division

cc: Mesker (2)  
Rick Wright (2)  
Ramesh Patel (1)  
File (1)