



ATLNC 0409.02-18

Report Date: 06/12/18

Dade Certification # 18-0213.12
FBC Organizational # TST 1555
IAS Certification # TL-423

Test Date: 04/09/18 – 04/11/18

Test Requested By: Carriage House Door Company
1571 E. Main St.
Old Fort, N.C. 28762
Phone: 828-668-1600 Fax: 828-668-1805

Test Standards: FBC TAS 201-94, 202-94, 203-94, HVHZ
ASTM E330-00, ANSI / DASMA 108-2012
ANSI / DASMA 115-2012

Note: All tests were conducted without deviation. Being wood the samples did not require Salt Spray Test.

Test Conditions: 70-75 degrees F

Design Pressures: +36.1 psf, -40.2 psf

Description of product tested: Specimens A, B, C, Carriage House Door 18' x 8' Model 205 (4) section Wood Garage Door as shown in drawing # Carriage-18-8-36-40. Drawing is an integral part of the test report and must accompany the report.

Description of Unit:

Component	Number	Description	Location
Sections	4	216" x 27" x 21" x 21" x 27" wood sections consisting of 1-3/8" thick wood frame sheathed on the interior by 1/4 exterior plywood and exterior by 1/4" exterior ply wood attached with 1/4" x 3/4" crown staple. The space between the plywood sheathing was	As shown in drawing.

		filled with foam insulation. Exterior faced with ½" x 6" Tongue and grooved boards glued (expanding urethane glue) and blind nailed with ¼" x ¾" crown staple and faced nailed under trim with (2" 18 ga brad nails) to 1/4" plywood. Trim was 5/8" x 6" boards blind nailed with (2" 18 ga brad nails). Top section had 4 windows. As shown in drawing	
End stiles	2 per section	5" wide x 1-3/8" x section height minus rails height.	End of each section
Windows	4	DO 41-3/4" x 16-5/8", 9/16" thick laminated glass ¼" annealed glass, 0.090" vinyl interlayer, ¼" annealed glass, Glass bite – 7/8" Sealed all 4 sides with Dow 995 sealant.	Top section
Intermediate Stiles	7 per section	2-1/4" wide x (section height - rail height) x 1-3/8" thick wood style.	2' 3" OC from section end
Rails	2 per section	Bottom rail on bottom section and top rail on top section 5" wide x 1-3/8" thick x 216" long. All other rails 2-1/4" wide x 1-3/8" thick x 216" long	Top and bottom of each section.
Steel Roller Hinges	4 per section joint	Double 11 ga galvanized steel hinges one side of door with outer hinge attached with (4) 1/4" x 2-1/4" carriage bolts and inner hinge attached with (4) 1/4" x 1-1/4" lag screws, other side of door both hinges attached with (4) 1/4" x 1-1/4" lag screws each.	Each end stile
Intermediate Hinges	7 per section joint	11 ga steel hinges (4) attached with (4) 1/4" x 2-1/4" carriage bolts and nuts each, (3) attached with (4) 1/4" x 1-1/4" lag screws each.	Each intermediate stile as shown in drawing.
½ hinges	4	11 ga steel ½ hinge attached with (4) 1-1/4" lags	3 rd section joint below windows as shown in drawing.
4" C-channel	3	16 ga 50 KSI 4" x 2-1/2" C-channel attached with 1-1/4" lags at each stile / hinge location.	2 on bottom section, 1 on 2 nd and 3 rd sections as shown in drawing
Channel Straps	11 per C-channel	20 ga steel 1" wide attached to each hinge by carriage bolt or lag, to the C-channel by (1) ¼" x 5/8" self drilling screw and to the stile with (1) ¼" x 1-1/4" lag screw as shown in drawing.	Each C-channel as shown in drawing.

C-channel plates	3 each C-channel	12 ga x 2-3/8" wide x 3-13/16" long attached to C-channel with (4) 1/4" x 1-3/4" self drilling screws	Located at the 3 center straps as shown in drawing.
3" Struts	4	20 ga 80 KSI hat strut attached with (2) 1/4" x 1-1/4" lag screw per stile	1 on 2 nd , 3 rd and 4 th sections as shown in drawing
3" 10 ball steel rollers	5 per side	2-13/16" diameter steel rollers with 7/16" x 7" stem with a 7/16" push nut. No push nut on bottom roller.	Right side of door in bottom and top brackets and end hinges
2" 10 ball steel rollers	5 per side	1-13/16" diameter steel rollers with 7/16" x 7" stem with a 7/16" push nut. No push nut on bottom roller.	Left side of door in bottom and top brackets and end hinges
Bottom Brackets	2	11 ga x 3" x 8" One side attached with (3) 1/4" x 2-1/4" carriage bolts and nuts. Other side attached with (3) 1-1/4" lags	Bottom left and right corners of bottom section.
Top Fixtures	4	12 ga (.101") fixtures, attached with (6) 1/4" x 1-3/8" lag screws each fixture.	2 each top corner of door
3" Vertical Track	1	3" x .090" thick vertical track attached to (7) 12 ga track brackets with (1) 1/4" x 5/8" track bolt and nut and attached to frame located from bottom at 3", 24", 32", 46-1/2", 52", 67", 73" with (1) 5/16 x 1-5/8" lag screw each, flag bracket attached to jamb with (3) 5/16" x 1-5/8" lag screws as shown in drawing.	Right side of door
3" Horizontal Track	1	Attached to 3" vertical track with (1) 1/4" x 5/8" track bolts and nuts and to the Flag bracket with (1) 3/8"x 3/4" carriage bolt.	Attached to top of 3" vertical track.
2" Vertical Track	1	2" x .083" thick vertical track attached to (7) 12 ga track brackets with (1) 1/4" x 5/8" track bolt and nut and attached to frame located from bottom at 3", 24", 32", 46-1/2", 52", 67", 73" with (1) 5/16 x 1-5/8" lag screw each, flag bracket attached to jamb with (3) 5/16" x 1-5/8" lag screws as shown in drawing.	Left side of door
2" Horizontal Track	1	Attached to 2" vertical track with (2) 1/4" x 5/8" track bolts and nuts and to the Flag bracket with (1) 3/8"x 5/8" carriage bolt.	Attached to top of 2" vertical track.

Counter balance System	1	Each side of the door balanced with a 1/8" metal cable. Each cable was attached to the bottom bracket and a drum on each side. Drums attached to a shaft and springs	Above the door
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STATIC AIR PRESSURE
TAS 202-94, ASTM E 330-02

Specimen A
Design Loads +36.1 psf, - 40.2 psf

Range of tests

Positive loads

½ Test
Design
Test

Time Seconds	Load psf	Max.	Perm.	Recovery
30	27.1	1-5/8"	0"	100%
30	36.1	1-7/16"	1/8"	91%
30	54.2	3-3/4"	1/4"	93%

Range of tests

Negative loads

½ Test
Design
Test

Time Seconds	Load psf	Max.	Perm.	Recovery
30	30.2	1-1/2"	0"	100%
30	40.2	2-3/16"	1/16"	97%
30	60.3	3-3/8"	3/16"	94%

Forced Entry Test

Forced entry test was conducted in accordance with TAS 202-94 and ASTM F588-07 with no deviation. Specimen Passed.

Impact
Large Missile
TAS 201-94, DASMA 115-12

Type and weight of missile: Missile level D - #2 Southern Pine 2 x 4, Length 96" and 9lbs. All corner shots were impacted away from structural supports.

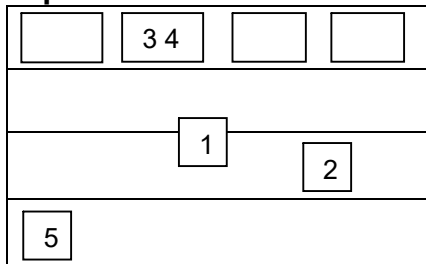
Note:

X measurement from left edge of specimen.

Y measurement from bottom edge of specimen

* Note: Window shots measurements from window frame.

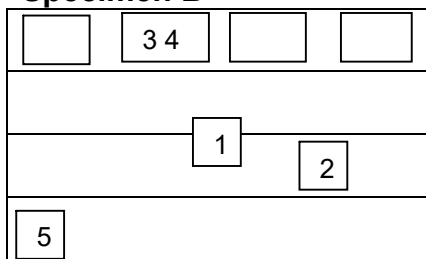
Specimen A



Impact No.	Speed Ft. / Sec.	X Meas.	Y Meas.	Degree of Orientation
1	49.5	107-1/2"	47-3/4"	358
2	50	135"	37-1/2"	0
3	49.8	81-3/4"	82-1/4"	358
4	50	93-3/4"	81-3/4"	350
5	50	11-1/8"	16-1/2"	5

Note: No penetration or ruptures occurred.

Specimen B



Impact No.	Speed Ft. / Sec.	X Meas.	Y Meas.	Degree of Orientation
1	49.5	106-3/4"	48-1/2"	0
2	49.9	133-1/4"	36-1/2"	355
3	50	81-1/4"	81"	350
4	49.9	92-1/4"	81-1/2"	350
5	50	9-1/4"	15"	355

Note: No penetration or ruptures occurred.

Specimen C

		5	4	3	6	
			1			
					2	
7						

Impact No.	Speed Ft. / Sec.	X Meas.	Y Meas.	Degree of Orientation
1	49.7	108-1/4"	48"	2
2	50	135-1/2"	36-3/4"	0
3	49.8	134-1/4"	81-3/4"	0
4	49.8	122-1/2"	81-1/4"	355
5	49.5	104"	81-1/2"	0
6	49.9	157-1/4"	80-3/4"	0
7	49.7	9-1/4"	14-3/4"	2

Note: No penetration or ruptures occurred.

Cyclical Test

FBC TAS 203-94, DASMA 115-12

Specimens: A, B, C

Design Loads: + 36.1 psf, - 40.2 psf

Range of test Positive loads	Actual Load psf	# of cycles	Cycles per minutes	A		B		C	
				max def	perm set	max def	perm set	max def	perm set
.2 - .5	7 - 18	3500	36	1-1/16"		1-1/16"		1-3/16"	
0 - .6	0 - 22	300	38	1-7/16"		1-3/8"		1-1/2"	
.5 - .8	18 - 29	600	35	2-1/16"		2"		2-1/8"	
.3 - 1.0	11 - 36	100	33	2-11/16"	5/16"	1-11/16"	1/8"	2-5/8"	1/16"

Range of test Negative loads	Actual Load psf	# of cycles	Cycles per minutes	A		B		C	
				Max def	perm set	max def	perm set	max def	perm set
.3 - 1.0	12 - 40	50	50	2-3/8"		2-5/16"		2-3/8"	
.5 - .8	20 - 32	1050	39	2-3/16"		1-13/16"		1-15/16"	
0 - .6	0 - 24	50	50	1-1/2"		1-5/16"		1-7/16"	
.2 - .5	8 - 20	3350	39	1-1/4"	1/8"	1-1/16"	3/16"	1-3/16"	1/8"

Cycles Completed 9000

Description of specimens after test:

Specimens showed no resultant failure or distress after cyclical test. All doors were operable before and after all tests.

Note: 2 mil polyethylene film was used for the Static Air Pressure Test, it is the opinion of the undersigned that it had no influence on the results of the test.

Technicians: Keith Owen
Samuel Poplin
Keith Owen Jr.

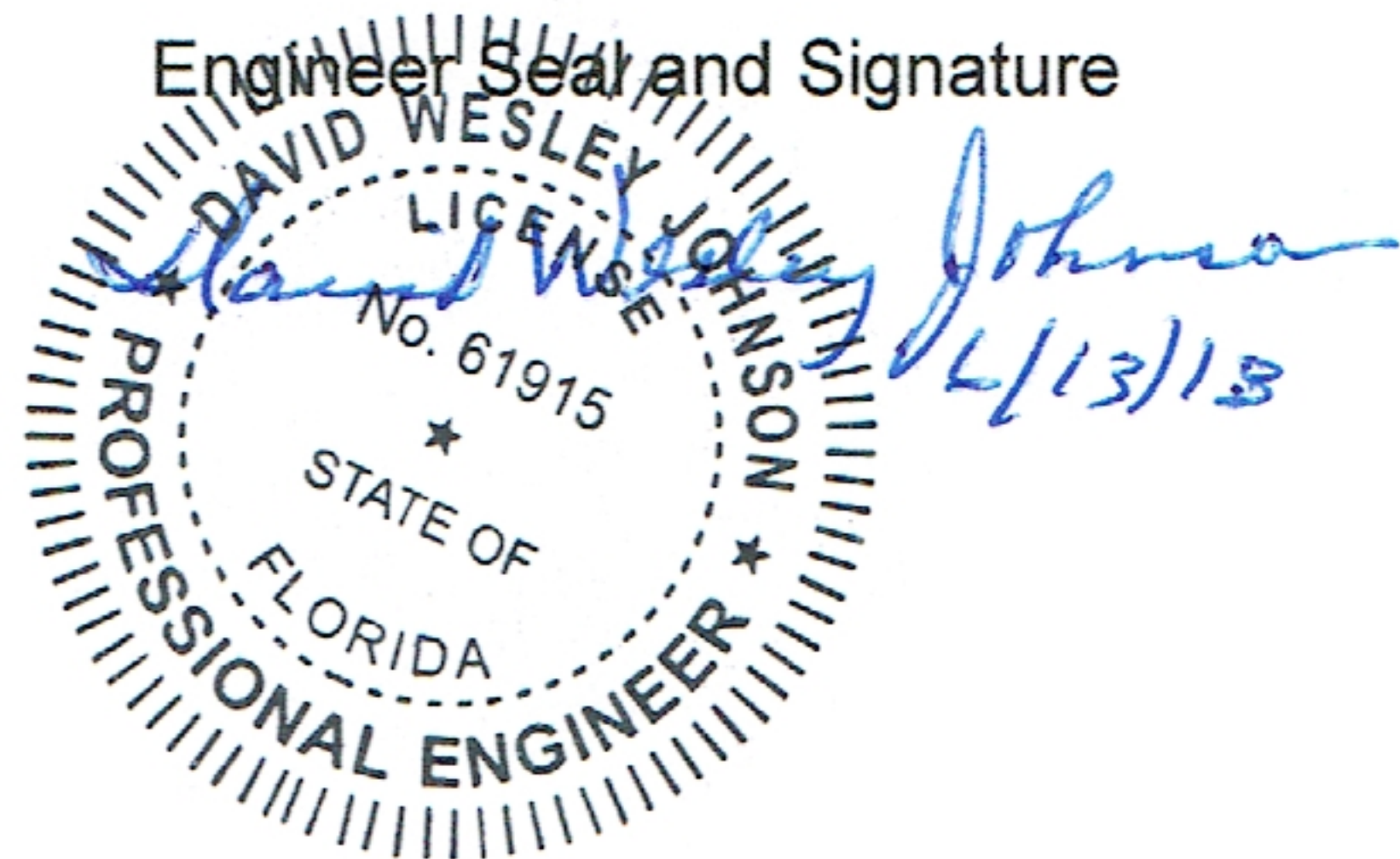
Observers-

Keith Owen, Ashley Poplin / ATL
Keith Owen Jr., Samuel Poplin/ ATL
David W. Johnson, P.E.
Shawn Guthrie / Carriage House Doors

Keith Owen, Lab Director
American Test Lab, Inc.

Keith Owen
6/13/18

All Tests Witnessed and Certified by:
David Johnson P. E.
1122 Calvert Rd.
Brevard, NC 28712
Florida P.E. # 61915



Certificate of Independence: The witnessing engineer has no equity/ownership interest in American Test Lab of North Carolina, Carriage House Doors or their parts vendors. Witnessing engineer is in complete compliance of Florida Statue 9B-72, Section 72.110

Disclaimer:

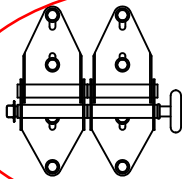
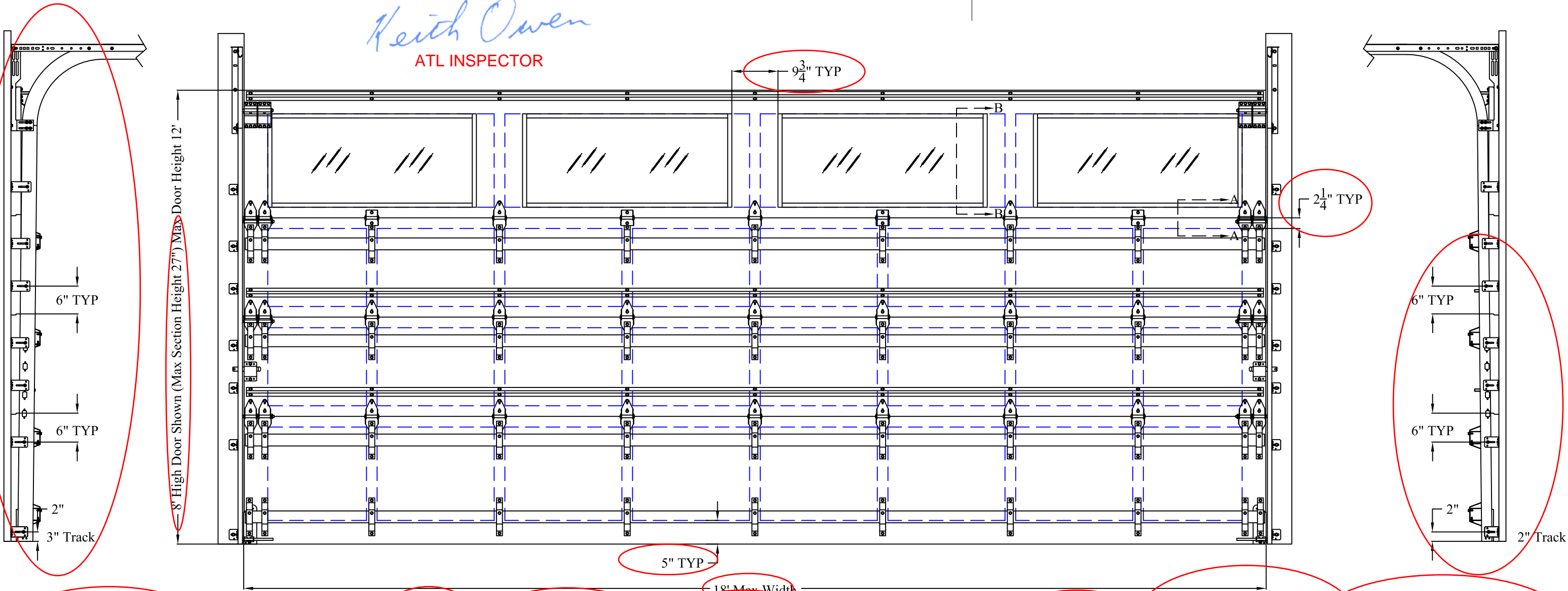
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AMERICAN TEST LAB NORTH
DATE 06/12/18
REPORT NO. ATLNC 0409.02-18

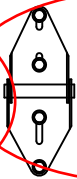
Keith Owen
ATL INSPECTOR

REVISIONS

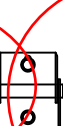
ZONE	REV	DESCRIPTION	DATE	APPROVED
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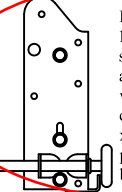
End Hinge
11 gauge galvanized steel double end hinges attached with four 1/4" x 2 1/4" carriage bolts or four 1/4" x 1 1/4" lag screws
Roller
2" steel or nylon roller with a hardened 7" stem and push nut installed (hurricane roller)



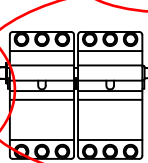
Center Hinge
11 gauge galvanized steel hinge at each center stile attached with four 1/4" x 2 1/4" carriage bolts or four 1/4" x 1 1/4" lag screws



Short Center Hinge
11 gauge galvanized steel hinge at each center stile attached with two 1/4" x 2 1/4" carriage bolts or two 1/4" x 1 1/4" lag screws (for use on glass section)



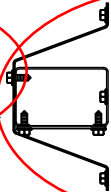
Bottom Bracket
11 gauge galvanized steel bottom bracket attached to bottom section with three 1/4" x 2 1/4" carriage bolts or three 1/4" x 1 1/4" lag screws (no push nut required on bottom roller)



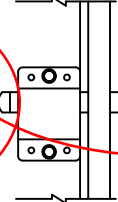
Top Fixture
12 gauge galvanized steel double top fixtures attached with six 1/4" x 1 1/4" lag screws each (push nut is required on top roller)



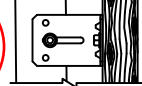
Struts
3" 20 gauge 80 ksi hat strut attached with two 1/4" x 1 1/4" lag screws per stile and located as shown on the sections



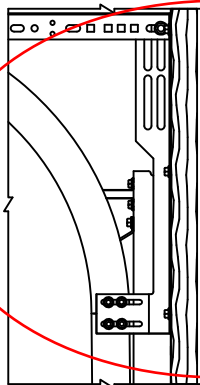
C Channels
4" x 2 1/2" 16 gauge 50 ksi channels attached with one 1 1/4" wide 16 gauge strap, one 1/4" x 5/8" self tapping screw and three 1/4" x 1 1/4" lag screws per stile and boxed with one 3.776" x 2 3/8" 12 gauge plate and four 1/4" x 5/8" self tapping screw at the center three stile locations



Locking Mechanism
Doors must have either an electronic operator or locking device installed (inside slide lock shown, other lock types permitted)



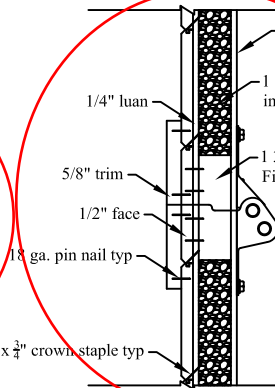
Track Brackets
12 gauge galvanized steel track bracket attached to wood jamb with one 5/16" x 1 5/8" wood lag screw and to vertical track with one 1/4" x 5/8" track bolt and nut



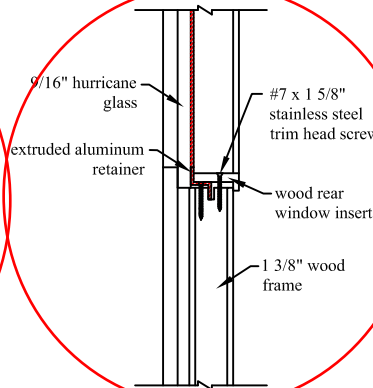
Flag Bracket
12 gauge galvanized steel flag bracket attached to wood jamb with three 5/16" x 1 5/8" wood lag screws and to the horizontal and vertical tracks with two 1/4" x 5/8" track bolts and nuts each

Horizontal Track and Angle
Horizontal track and angle to suit

Vertical Track
2" galvanized steel track with a minimum thickness of .083" or 3" galvanized steel track with a minimum thickness of .090"



Section A - A



Section B - B

Windows (optional)
9/16" hurricane glass windows with a maximum opening of 41 3/4" x 16 5/8" on the front and 43 1/2" x 18 3/8" on the back, retained on all four sides by an extruded aluminum retainer and wood rear window insert attached with #7 x 1 5/8" stainless steel trim head screws (overlap on all four sides is 7/8"), and sealed on all four edges with Dow Corning 995 sealant

Note: The design of the supporting structural elements shall be the responsibility of the professional of record for the structure and in accordance with current building codes for the loads listed on this document

Models: Design 101-108, 201-203
Tested in accordance with ANSI/DASMA 108 and ANSI/DASMA 115
Design Pressure: +36.1/-40.2 PSF
Test Pressure: +54.15/-60.3 PSF
DRAWN BY:
John M. Stroede 6/5/18
APPROVED BY:
John M. Stroede 6/5/18

Carriage House Door
COMPANY
15411 MAIN ST HWY 79
OLD FORT, NC 28762
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TITLE		18x8 Carriage House Door +36.1/-40.2 PSF	
DRAWING NUMBER		Carriage-18-8-36-40	
REVISION		A	
SIZE	B	SCALE	N/A
SHEET	1 of 1		