Fenestration MASTER™
FGIA Professional Certification by AAMA

STORM SAFE

Damage Assessment Consultants

Forensic Glazing Evaluations

Roofing System Assessment

Fire Loss Evaluations

Flood Evaluations

Expert Witness & Trial Support

The [redacted]

Water Penetration Forensic Investigation

FINAL – 5-5-21

[redacted]

Members Of:

ASTM International Member

American Architectural Manufacturers Association AAMA

1-800-396-0167

WWW.TSSA-STORMSAFE.COM

Glazing Inspection Report

[redacted]

Tallahassee, Fl 32312

FINAL - Report date 5-5-20

Services Performed

At the request of [redacted] TSSA Storm Safe DAC Inc. performed a diagnostic water penetration inspection of the installed glazed systems at the [redacted] on the following dates:

Preliminary Evaluation Dates
Saturday, April 3rd, 2021

Inspection Dates
Wednesday, April 21st – Friday, April 23rd, 2021

The purpose of this inspection was to evaluate the following installed glazed systems' ability to manage water infiltration and penetration and ascertain any remedial procedures needed to correct the exterior building envelope of protection from reported moisture penetration.

- Three Panel Sliding Glass Door
- Single Hung Window Systems

Present during the inspection and testing performed at The Barrington Condominium Association were Ivan Browner (President), Steven Browner (Vice President), and Richard Orahood (Project Director) from TSSA Storm Safe DAC Inc., a professional Glazing Investigation Service.

The Inspection Protocol followed during the [redacted] glazing evaluation was performed in general conformance with:

ASTM E-1105-15 "Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference."

ASTM E-2128-17 "Standard Guide for Evaluation Water Leakage of Building Walls."

AAMA 511-08 "Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products

TSSA Storm Safe DAC Inc. employed the usage of The Ryobi Model # E49MM01 Moisture Meter Gauge during our evaluation of [redacted] (see the Limitations section). Also, Measuring Tapes, Screw Drivers, and Flashlights were employed by our inspection teams to visually evaluate the glazed systems in question.

[redacted]

[redacted]

The [redacted] was built in 2004. The campus includes fourteen (14) buildings comprising 300 total units with clubhouse, pool, tennis courts, and storage units located on the campus. The construction method is a wood frame with exterior OSB sheathing and finished with either a Hardie Siding over building wrap or applied Coronado Stone facia over building wrap. The glazed envelope was constructed utilizing a combination of single hung windows and three panel sliding glass doors.

Glazed System Installed

The Single Hung Windows installed at the [redacted] were manufactured by H-R Windows located in Dallas, Texas. H-R Windows was acquired by Atrium Windows, which is still in operation. H-R Windows AAMA Manufacturers Code at the time of their operation was HRW-1. H-R windows are no longer manufacturing framing members or components for their window systems.

Code Searched: HRW-1

Manufacturer:	H-R Windows	HRW-1
Address:	959 Profit Dr.	
City, State Zip	Dallas, TX 75247	
Phone / Alt Phone	800-935-9000 /	
Years		

Three Panel Sliding Glass Door (Williams Door - manufactured by Willams Door "A Raymond Company.") - all-aluminum frame, glazed with 3/16" inch tempered glass anchored into host structure through nailing flange used to set primary seal during installation)

Installed System Design Pressure

Single Hung Window Systems

H-R Series 300 Single Hung Window – manufactured by H-R Windows located in Dallas, Texas - (Atrium Windows acquired H-R Windows) stipulates conformity to AAMA/NWWDA 101/ I.S. 2-97. According to AAMA/NWWDA 101/ I.S. 2-97 page 11 section 2, a residential rated single hung window's primary performance required a performance rating of: design pressure of 15 (720) lbs/ft^2(Pa) / Structural Test Pressure or 22.5 (1080) lbs/ft^2(Pa) / and Water Resistance Pressure of 2.86 (140) lbs/ft^2(Pa). See the list below:

TABLE 2.1 – GATEWAY PERFORMANCE REQUIREMENTS

Window/Door Designation (Minimum Test Size)		Reference Section	Design Pressure		Structural Test Pressure		Water Resistance Test Pressure		Air Leakage Maximum Rate (1) Test Pressure			
			lbf/ft^2	(Pa)	lbf/ft^2	(Pa)	lbf/ft^2	(Pa)	lbf/ft^2	(Pa)	ft^3/(min•ft^2)	m^3/(h•m^2)
Group I			**Sliding Seal Window Products**									
Single/Double/Triple Hung Windows		2.2.1, p. 9										
H-R15	(3'8" x 5'0")		15	(720)	22.5	(1080)	2.86	(140)	1.57	(75)	0.3	(5)
H-LC25	(3'8" x 6'5")		25	(1200)	37.5	(1800)	3.75	(180)	1.57	(75)	0.3	(5)
H-C30	(4'6" x 7'6")		30	(1440)	45.0	(2160)	4.50	(220)	1.57	(75)	0.3	(5)
H-HC40	(5'0" x 8'0")		40	(1920)	60.0	(2880)	6.00	(290)	1.57	(75)	0.3	(5)
H-AW40	(5'0" x 8'0")		40	(1920)	60.0	(2880)	8.00	(390)	6.24	(300)	0.3	(5)
Horizontal Sliding Windows		2.2.2, p. 11										

The windows installed at the [redacted] were rated higher than the primary performance requirements listed above. The windows installed were designated as a Residential Rated Window Product listed as H-R50 (Single Hung Window – Residential Designation.)

This higher than minimum performance class designation allowed the specifier to designate a window system that exceeded the minimum AAMA specification due to the usage and function these windows would be called upon to perform. According to Pg. 42 Section 4.1 "table 3.1" of AAMA/NWWDA 101/ I.S. 2-97 the windows systems installed at [redacted] were successfully tested to the specified higher classification listed below.

OPTIONAL PERFORMANCE GRADES									
Optional Performance Grade	Applicable Product Designation	Design Pressure		Structural Test Pressure		Water Resistance Test Pressure			
						R, LC, C and HC		AW	
		lb/ft²	(Pa)	lb/ft²	(Pa)	lb/ft²	(Pa)	lb/ft²	(Pa)
20	R	20	(960)	30.0	(1440)	3.00	(150)	— —	— —
25	R	25	(1200)	37.5	(1800)	3.75	(180)	— —	— —
30	R,LC	30	(1440)	45.0	(2160)	4.50	(220)	— —	— —
35	R,LC,C	35	(1680)	52.5	(2520)	5.25	(260)	— —	— —
40	R,LC,C	40	(1920)	60.0	(2880)	6.00	(290)	8.00	(390)
45	R,LC,C,HC,AW	45	(2160)	67.5	(3240)	6.75	(330)	9.00	(440)
50	R,LC,C,HC,AW	50	(2400)	75.0	(3600)	7.50	(360)	10.00	(480)
55	R,LC,C,HC,AW	55	(2640)	82.5	(3960)	8.25	(400)	11.00	(530)
60	R,LC,C,HC,AW	60	(2880)	90.0	(4320)	9.00	(440)	12.00	(580)
65	R,LC,C,HC,AW	65	(3120)	97.5	(4680)	9.75	(470)	12.00	(580)
70	R,LC,C,HC,AW	70	(3360)	105.0	(5040)	10.50	(510)	12.00	(580)
75	R,LC,C,HC,AW	75	(3600)	112.5	(5400)	11.25	(540)	12.00	(580)
80	R,LC,C,HC,AW	80	(3830)	120.0	(5750)	12.00	(580)	12.00	(580)
85	R,LC,C,HC,AW	85	(4080)	127.5	(6110)	12.00	(580)	12.00	(580)
90	R,LC,C,HC,AW	90	(4320)	135.0	(6470)	12.00	(580)	12.00	(580)

TABLE 3.1

The AAMA/NWWDA 101/ I.S. 2-97 document allows a manufacturer to test their products at higher than minimum allowable design pressure to meet various installation demands. H-R Windows. manufactured Optional Performance Class Single Hung window systems that gave architects/specifiers the ability to meet the design requirements when [redacted] was being constructed.

Sliding Glass Doors

Williams Door series 101 Sliding Glass Door - manufactured by Williams Doors "A Raymond Company" was manufactured and stipulated conformity to ANSI/AAMA/WDMA 101/IS2-97. According to ANSI/AAMA/WDMA 101/IS2-97 page 11 section 2, a commercial rated Sliding Glass Door's primary performance required a performance rating of: design pressure of 30 (1440) lbs/ft^2(Pa) / Structural Test Pressure or 45.0 (2160) lbs/ft^2(Pa) / and Water Resistance Pressure of 1.57 (75) lbs/ft^2(Pa). See the list below:

Window/Door Designation (Minimum Test Size)		Reference Section	Design Pressure		Structural Test Pressure		Water Resistance Test Pressure		Air Leakage Test Pressure		Air Leakage Maximum Rate (1)	
			lbf/ft^2	(Pa)	lbf/ft^2	(Pa)	lbf/ft^2	(Pa)	lbf/ft^2	(Pa)	ft^3/(min•ft^2)	m^3/(h•m^2)
Sliding Glass Doors (4)		2.2.19, p. 31										
SGD-R15	(2'10"x 6'6")		15	(720)	22.5	(1080)	2.86	(140)	1.57	(75)	0.3	(5)
SGD-LC25	(3'6" x 6'8")		25	(1200)	37.5	(1800)	3.75	(180)	1.57	(75)	0.3	(5)
SGD-C30	(3'10"x 6'10")		30	(1440)	45.0	(2160)	4.50	(220)	1.57	(75)	0.3	(5)
SGD-HC40	(4'10"x 7'10")		40	(1920)	60.0	(2880)	6.00	(290)	6.24	(300)	0.3	(5)
SGD-AW40	(4'10"x 7'10")		40	(1920)	60.0	(2880)	8.00	(390)	6.24	(300)	0.3	(5)

The Sliding Glass Doors installed at the [redacted] were rated higher than the primary performance requirements listed above. The windows installed were designated as a Commercial Rated Sliding Glass Door Product listed as SGD-C35 (Sliding Glass Door – Commercial Designation.)

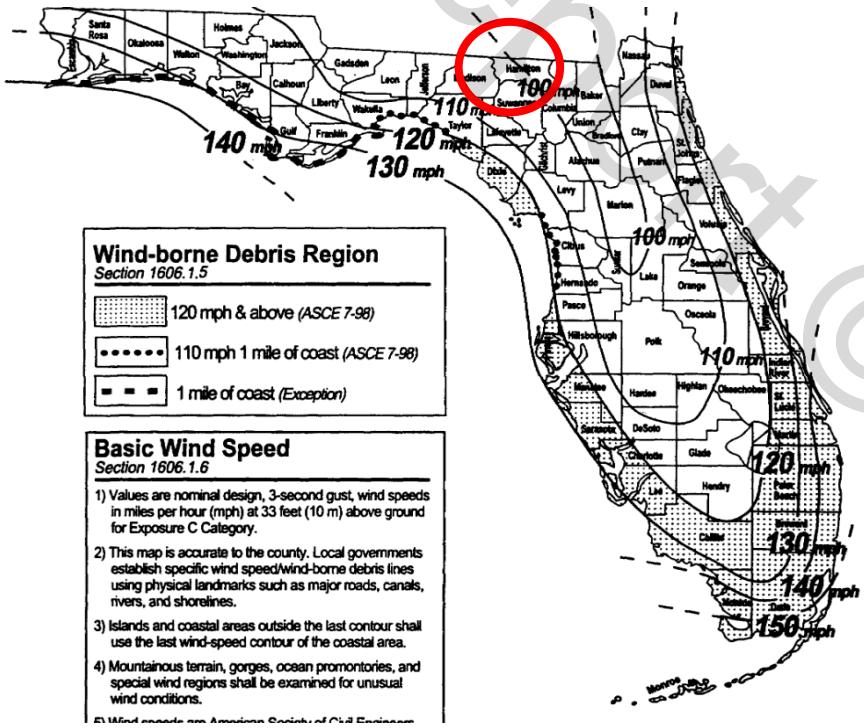
This higher than minimum performance class designation allowed the specifier to designate a Sliding Glass Door system that exceeded the minimum AAMA specification due to the usage and function these Sliding Glass Doors would be called upon to perform. According to Pg. 42 section 4.1 "table 3.1" of ANSI/AAMA/WDMA 101/IS2-97 the Sliding Glass Door

systems installed at [redacted] were successfully tested to the specified higher classification listed below.

OPTIONAL PERFORMANCE GRADES									
Optional Performance Grade	Applicable Product Designation	Design Pressure		Structural Test Pressure		Water Resistance Test Pressure			
						R, LC, C and HC		AW	
		lb/ft²	(Pa)	lb/ft²	(Pa)	lb/ft²	(Pa)	lb/ft²	(Pa)
20	R	20	(960)	30.0	(1440)	3.00	(150)	— —	— —
25	R	25	(1200)	37.5	(1800)	3.75	(180)	— —	— —
30	R,LC	30	(1440)	45.0	(2160)	4.50	(220)	— —	— —
35	R,LC,C	35	(1680)	52.5	(2520)	5.25	(260)	— —	— —
40	R,LC,C	40	(1920)	60.0	(2880)	6.00	(290)	8.00	(390)
45	R,LC,C,HC,AW	45	(2160)	67.5	(3240)	6.75	(330)	9.00	(440)
50	R,LC,C,HC,AW	50	(2400)	75.0	(3600)	7.50	(360)	10.00	(480)
55	R,LC,C,HC,AW	55	(2640)	82.5	(3960)	8.25	(400)	11.00	(530)
60	R,LC,C,HC,AW	60	(2880)	90.0	(4320)	9.00	(440)	12.00	(580)
65	R,LC,C,HC,AW	65	(3120)	97.5	(4680)	9.75	(470)	12.00	(580)
70	R,LC,C,HC,AW	70	(3360)	105.0	(5040)	10.50	(510)	12.00	(580)
75	R,LC,C,HC,AW	75	(3600)	112.5	(5400)	11.25	(540)	12.00	(580)
80	R,LC,C,HC,AW	80	(3830)	120.0	(5750)	12.00	(580)	12.00	(580)
85	R,LC,C,HC,AW	85	(4080)	127.5	(6110)	12.00	(580)	12.00	(580)
90	R,LC,C,HC,AW	90	(4320)	135.0	(6470)	12.00	(580)	12.00	(580)

TABLE 3.1

At the time of construction, Leon County was considered a 110-mph wind zone specified by section 16.8 of the 2001 Florida Building Code.

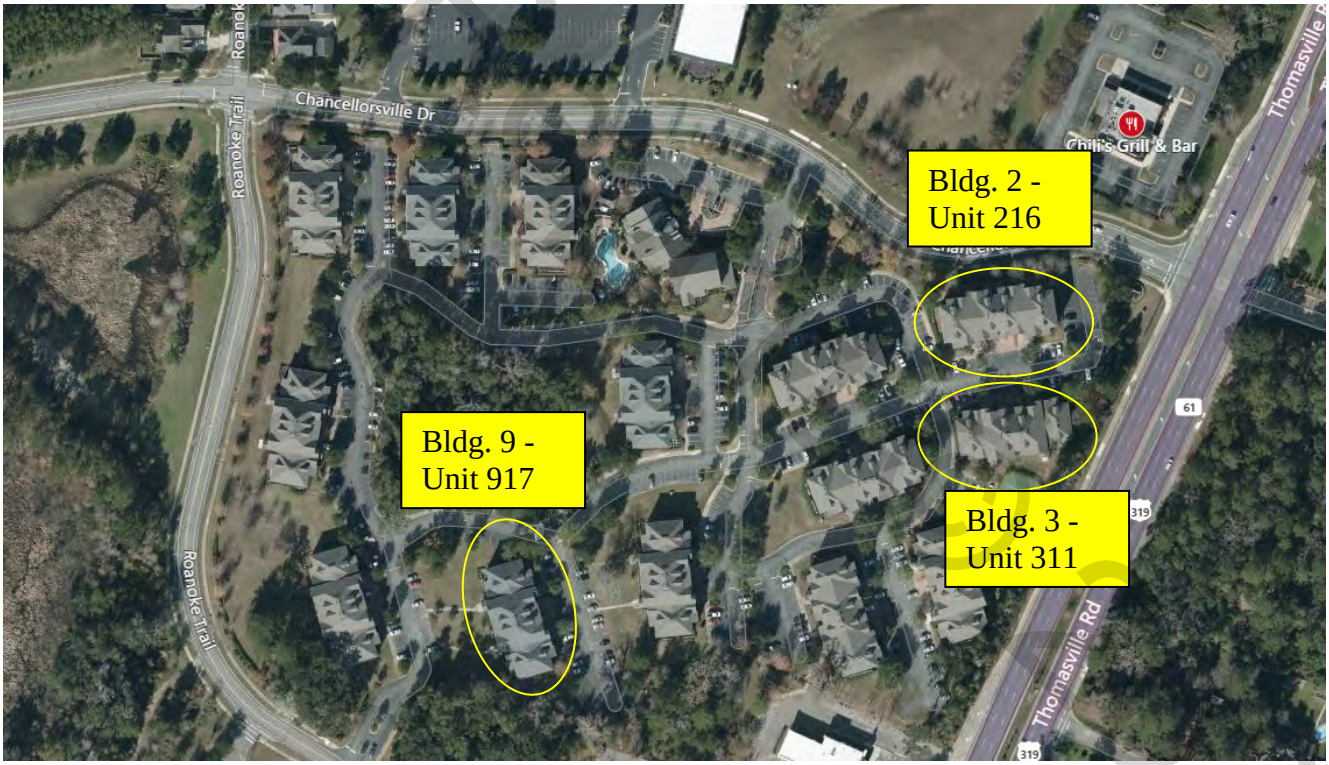


The Single Hung Windows and Sliding Glass Doors installed at [redacted] were specified to conform with the Building Code enforced at the time of construction.

Inspection Data – Units Inspected By TSSA Storm Safe Inc.

[redacted] Association

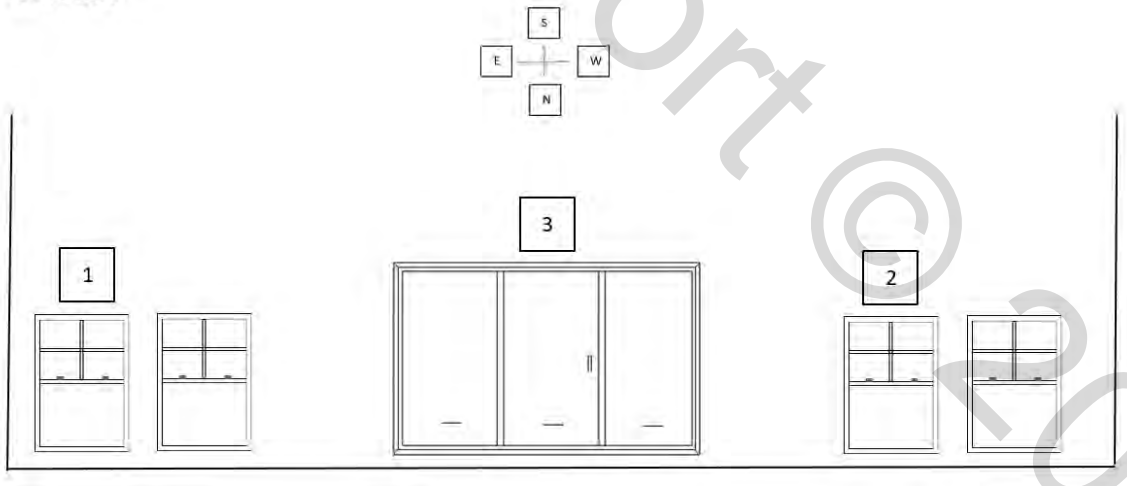
At the Property Management request, TSSA Storm Safe DAC Inc. performed testing in 3 units (9 window specimens) during our 3-day site visit to the [redacted]



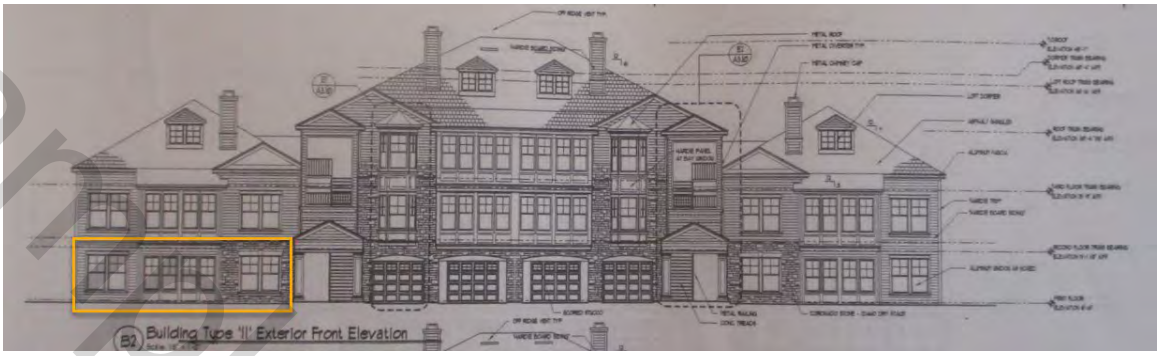
Specimen Selection

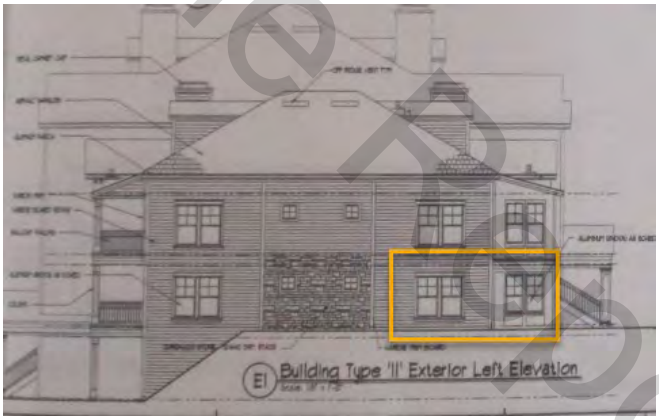
Building 2 – Unit 216

Unit 216

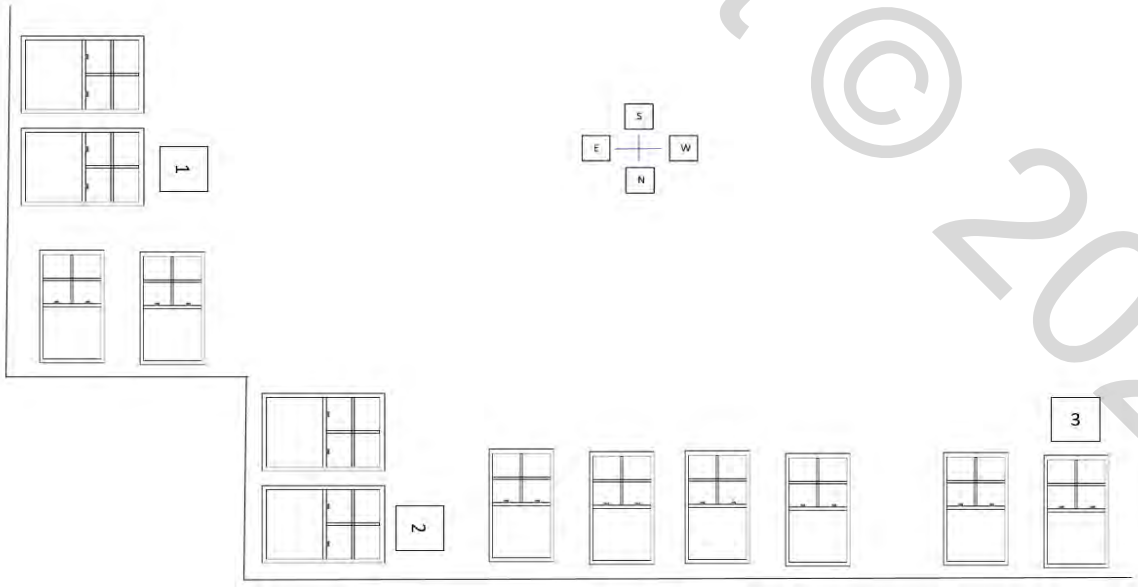


Building 3 – Unit 311

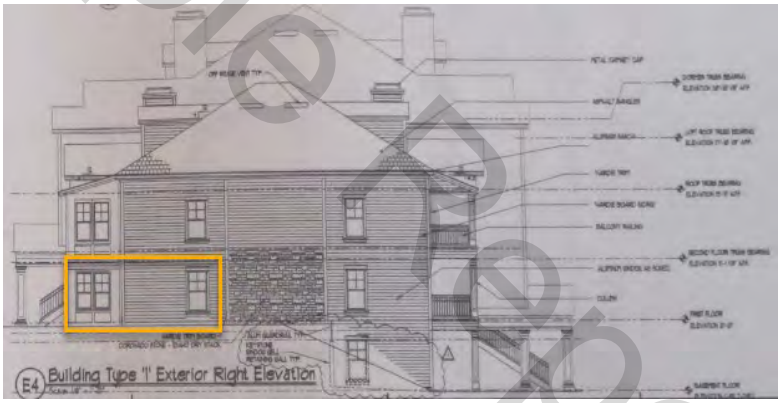


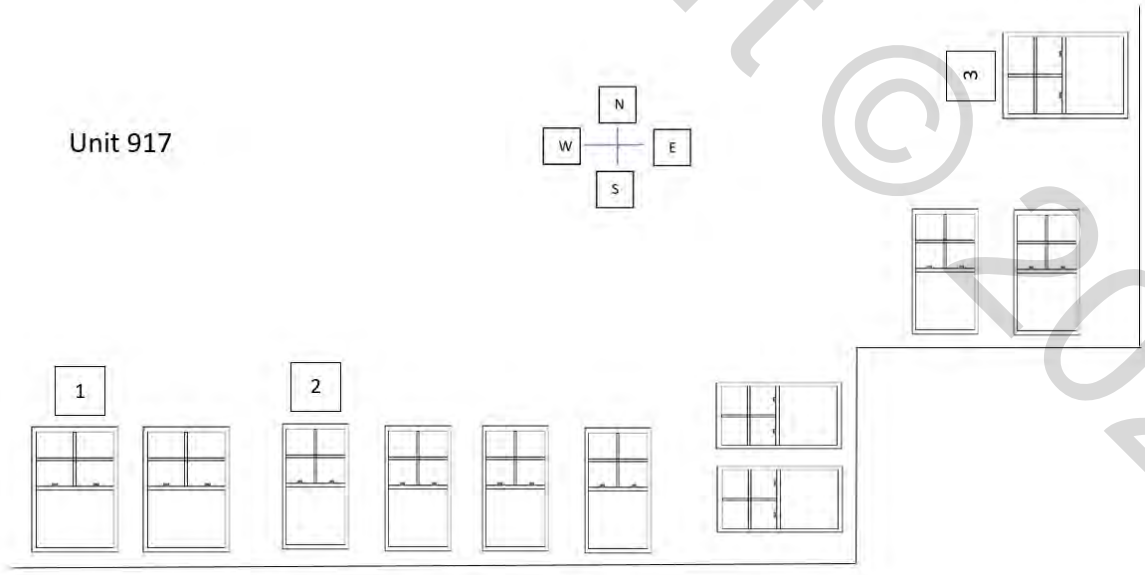


Unit 311



Building 9 – Unit 917





Testing Plan

History:

On Saturday, April 3rd, 2021, Ivan Browner (President) and Steven Browner (Vice President) met with [redacted] (Property Manager) at the [redacted] in Tallahassee, Florida.

Mr. Holloway explained that several residents have been complaining about water intrusion through the windows of their units. Several of the units have been undergoing interior remediation from water damage. Others have an ongoing issue where the unit owners are forced to dry, clean, and deodorize their units regularly.

The Association was in a planning stage to perform a remediation protocol on the exterior of the buildings to control and mitigate water intrusion through the exterior envelope of protection, focusing on the glazed systems.

Mr. [redacted] arranged access for TSSA Storm Safe DAC Inc to physically inspect two (2) units (216 & 226) during our initial site visit. Measurements and photographs were taken to determine the specification and disposition of the glazed systems installed.

During TSSA's physical evaluation, it was determined that the windows and sliding glass doors were in conformity and specified to AAMA/NWWDA 101/ I.S. 2-97.

Windows H-R50
Sliding Glass Doors SGD-C35

Upon physical inspection, TSSA Storm Safe DAC Inc. agreed that a diagnostic testing protocol would be necessary to assist the Association in creating an achievable remediation protocol.

Planning:

As per the [redacted] request, TSSA Storm Safe DAC Inc was retained to test 3 ground floor units (3 specimens in each of the units.)

Units Chosen:
Bldg. 2 – Unit 216 – "unoccupied."
Bldg. 3 – Unit 311 – "unoccupied."
Bldg. 9 – Unit 917 – "occupied."

Testing Protocol:

When planning the testing of the glazed systems selected at the [redacted] the steps put forth in section 5.1.1 of the ASTM E-2128 document titled "Sequence of Activities" were taken into consideration:

5.1.1.1 Review of project documents.
5.1.1.2 Evaluation of design concept.
5.1.1.3 Determination of service history.
5.1.1.4 Inspection.
5.1.1.5 Investigative testing.
5.1.1.6 Analysis.
5.1.1.7 Report preparation.

After reviewing the project details and design concept "building plans," discussing the service history from discussions with the property manager, TSSA Storm Safe DAC Inc. performed a preliminary physical evaluation of several specimens to determine the proper testing protocol to employ for the Investigative testing step.

It was determined that the appropriate test protocol to employ would be:

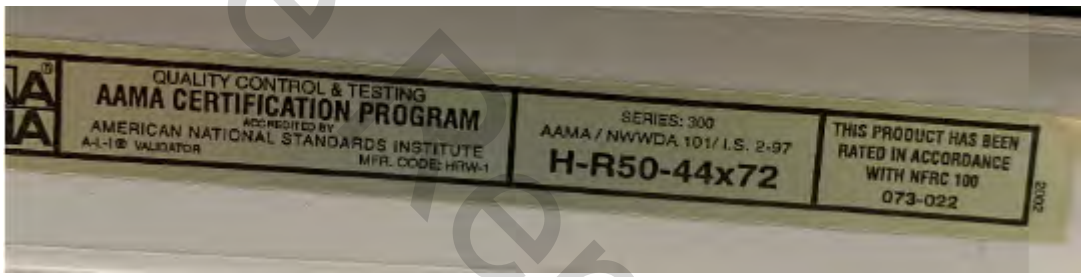
ASTM E-1105 – Procedure B "Test under cyclic static air pressure difference." To be applied in conformity with the protocol established by ASTM E-2128 "Standard Guide for Evaluating Water Leakage in Building Walls."

TSSA Storm Safe DAC Inc. created the following testing plan to conform with the applied testing standards:

Testing Plan Explanation:

As explained in the section of this report titled "Installed System Design Pressure," each of the glazed systems installed at the [redacted] was rated by AAMA to comply with a specified Performance Grade.

Single Hung Window System:



Specified Performance Grade		
Design Pressure	50.00	PSF
Structural Load Test Pressure	75.00	PSF
Total Water Resistance	7.50	PSF
Water Test Pressure Inches per water	1.45	In/H2O

According to the AAMA 511-08 Standard Section 4.2.1.1 "point 4" to find the appropriate Field-Testing Pressure, it is recommended to calculate a 2/3 deduction from the specified design pressure.

50 PSF (rated design pressure) * 0.66667 = 33.33 PSF (field testing pressure)

The water infiltration resistance testing pressure is to be determined by calculating 15% (R, LC, C, HC) or 20% (AW) of the Field-Testing Pressure:

33.33 * 15% = 4.9995 PSF (5.0 PSF water resistance testing pressure)

The Testing Plan was specified to follow the ASTM E-1105 – Procedure B. utilizing a cyclic static pressure difference. TSSA Storm Safe DAC Inc. as the specifying authority, created a testing protocol that incrementally raises the testing pressure each testing cycle to reach the ultimate calculated testing pressure. This method is common in the industry to produce statistical data to track the pressure level achieved when a failure is recorded and determine if the glazed systems are adequately performing their function to protect the interior occupied space from the exterior elements.

To achieve the specified testing plan, the following calculated testing pressures were employed.

Single Hung Window

Testing Plan		
Total Water Resistance	5.00	PSF
Water Test Pressure Inches per water	0.97	In/H2O

	Field Test Water Infiltration (PSF)		Field Test Water Infiltration (In/H2O)		Pascal		Time Duration	
Cycle 1	1.67	PSF	0.32	In/H2O	79.800	Pa	5:00	min
	0.00	PSF	0.00	In/H2O	0.000	Pa	< 1:00	min
Cycle 2	3.33	PSF	0.64	In/H2O	159.601	Pa	5:00	min
	0.00	PSF	0.00	In/H2O	0.000	Pa	< 1:00	min
Cycle 3	5.00	PSF	0.97	In/H2O	239.401	Pa	5:00	min
	0.00	PSF	0.00	In/H2O	0.000	Pa	< 1:00	min

Sliding Glass Door Systems

Specified Performance Grade		
Design Pressure	35	PSF
Structural Load Test Pressure	52.5	PSF
Total Water Resistance	5.25	PSF
Water Test Pressure Inches per water	1.01	In/H2O

According to the AAMA 511-08 Standard Section 4.2.1.1 "point 4," to find the appropriate Field-Testing Pressure, it is recommended to calculate a 2/3 deduction from the specified design pressure.

35 PSF (rated design pressure) * 0.66667 = 23.33 PSF (field testing pressure)

The water infiltration resistance testing pressure is to be determined by calculating 15% (R, LC, C, HC) or 20% (AW) of the Field-Testing Pressure:

23.33 * 15% = 3.4995 PSF (3.5 PSF water resistance testing pressure)

The Testing Plan was specified to follow the ASTM E-1105 – Procedure B. utilizing a cyclic static pressure difference. TSSA Storm Safe DAC Inc. as the specifying authority, created a testing protocol that incrementally raises the testing pressure each testing cycle to reach the ultimate calculated testing pressure. This method is common in the industry to produce statistical data to track the pressure level achieved when a failure is recorded and determine if the glazed systems are adequately performing their function to protect the interior occupied space from the exterior elements.

To achieve the specified testing plan, the following calculated testing pressures were employed.

Sliding Glass Door

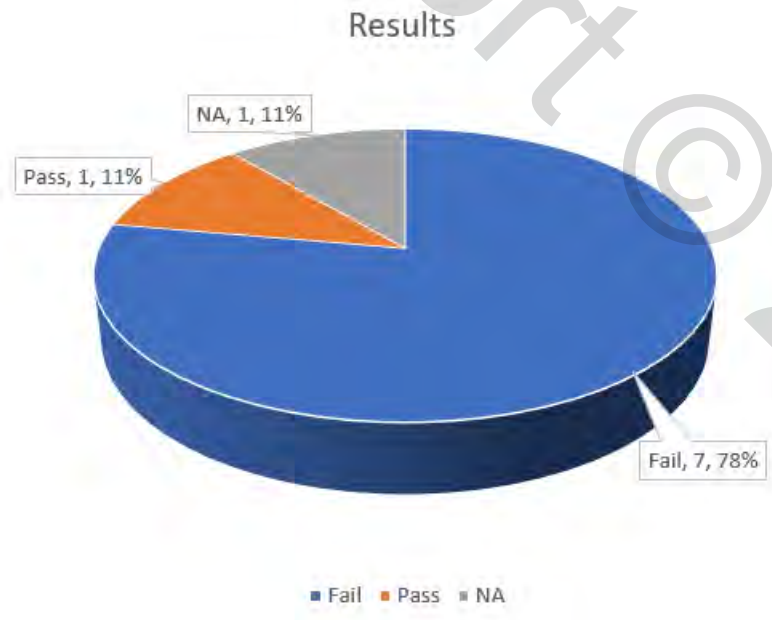
Testing Plan		
Total Water Resistance	3.50	PSF
Water Test Pressure Inches per water	0.68	In/H2O

	Field Test Water Infiltration (PSF)		Field Test Water Infiltration (In/H2O)		Pascal		Time Duration	
Cycle 1	1.17	PSF	0.23	In/H2O	55.860	Pa	5:00	min
	0.00	PSF	0.00	In/H2O	0.000	Pa	< 1:00	min
Cycle 2	2.33	PSF	0.45	In/H2O	111.720	Pa	5:00	min
	0.00	PSF	0.00	In/H2O	0.000	Pa	< 1:00	min
Cycle 3	3.50	PSF	0.68	In/H2O	167.581	Pa	5:00	min
	0.00	PSF	0.00	In/H2O	0.000	Pa	< 1:00	min

Testing Results – Analysis

For a complete description of each specimen recorded testing data, see the section titled: “Exhibit A – Field Inspection Notes and Photos.”

			Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Result	Time
Building 2	Unit 216	spec 1	2	7.5	12 PSI	0.65	F	0:03:28
Building 2	Unit 216	spec 2	1	7.5	12 PSI	0.32	F	0:04:54
Building 2	Unit 216	spec 3	1	7.5	12 PSI	0.23	NA	0:05:00
Building 3	Unit 311	spec 1	2	7.5	12 PSI	0.65	F	0:03:31
Building 3	Unit 311	spec 2	1	7.5	12 PSI	0.32	F	0:04:59
Building 3	Unit 311	spec 2	1	7.5	12 PSI	0.32	F	0:03:40
Building 9	Unit 911	spec 1	2	7.5	12 PSI	0.65	F	0:01:44
Building 9	Unit 911	spec 2	2	7.5	12 PSI	0.65	F	0:02:26
Building 9	Unit 911	spec 3		7.5	12 PSI	0.97	P	0:26:14



Testing activities performed onsite produced the following results:

7 of 9 (78%) units tested ended in a Failing result.
1 of 9 (11%) units tested ended in a Passing result.
1 of 9 (11%) units tested ended in a NA result.

FAILURE:

According to Section 3.2.3 of the ASTM E-1105 testing standard, failure is defined as follows:

> 3.2.3 water penetration, n—penetration of water beyond a plane parallel to the glazing (the vertical plane) intersecting the innermost projection of the test specimen, not including interior trim and hardware, under the specified conditions of air pressure difference across the specimen.

According to this statement, the interpretation of Water Penetration (Failure) is when water penetrates beyond the glazed system's water management system and is witnessed beyond the innermost part of the window system framing or installation.

For example, when water is seen on the marble/drywall sill or drywall reveal (head, jamb, or sill) beyond the framing system, this is considered a failure according to ASTM E-1105.

PASSING:

If water is witnessed on a frame member of an installed glazed system or is contained within the Sill Frame Member and does not reach beyond the frame into interior living space, the window is considered to have passed the test.

All glazed systems have designed within them Water Management Systems to handle "Water Infiltration."

According to ASTM E-2128 Section 3.2.3, Water Infiltration is defined as follows:

> 3.2.3 water infiltration—a process in which water passes through a material or between materials in a system and reaches a space that is not directly or intentionally exposed to the water source.

A window system is designed to manage limited water infiltration through its integration with the buildings Water Resistance Barrier, Moisture Drainage Plane, Incorporating Sill End Damn, Weeping Systems, and other water mitigation design systems.

If a window system operates according to its specified, designed water resistance testing pressure and is installed according to its manufacturer's prescribed installation method, it can manage limited moisture intrusion and protect the interior occupied space from the exterior elements.

To understand this, point further:

> "If the water that has leaked to the inside of the window does not breach the innermost plane of the window itself, the water cannot damage the building because the window is still protecting it from any of the water infiltration." - [redacted] "Building Consultant."

However, when a window system is compromised, stressed beyond its specified design pressure, and has exhibited signs of failure, moisture intrusion can escalate to moisture penetration. The window system cannot handle the amount of uncontrolled "water leakage" attacking the exterior glazed envelope. According to ASTM E-2128 section 3.2.4, Water Leakage is defined as follows:

> 3.2.4 water leakage—water that is uncontrolled; exceeds the resistance, retention, or discharge capacity of the system; or causes subsequent damage or premature deterioration.

Non-Achievable (NA)

NA – The final result of one of the systems tested, "Sliding Glass Door" (Building 2 – unit 216 – spec 3), was inconclusive due to the fact that TSSA Storm Safe DAC Inc. inspectors were not able to create a strong enough vacuum pressure within our constructed testing chamber.

This was because there was a great deal of uncontrollable Air Infiltration between the installed Sliding Glass Door System and the Fenestration it was installed within.

Testing Results - Water Penetration & Water Infiltration

Unit 216

Water penetration was witnessed at the sill frame member of window systems tested by the ASTM E-1105 field test.

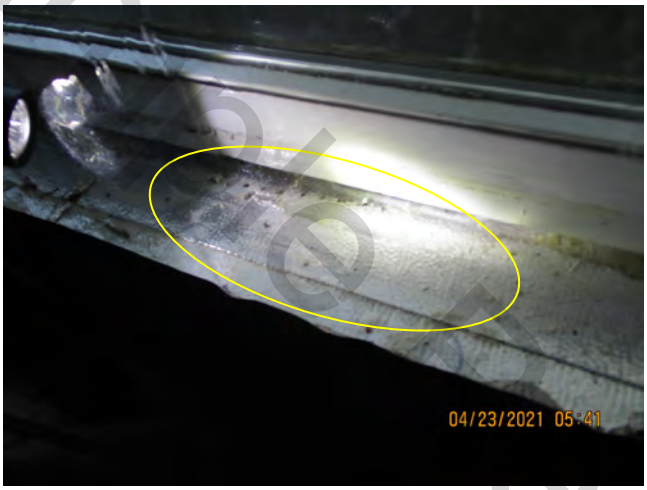
Water Penetration witnessed at window sill – unit 216 – spec 1

Water Penetration witnessed at window sill – unit 216 – spec 2

Water Penetration witnessed at window sill – unit 216 – "untested system adjacent to spec 2"

Unit 311

Water penetration was witnessed at the interlocking frame member and sill frame member of window systems tested by the ASTM E-1105 field test.



Water Penetration witnessed at window sill – unit 311 – spec 1

Water Penetration witnessed at window sill – unit 311 – spec 2

Water Penetration witnessed at interlock and sill – unit 311 – spec 3

Unit 917

Water penetration was witnessed at the interlocking frame member and sill frame member of window systems tested by the ASTM E-1105 field test.

Water Penetration witnessed at window sill – unit 917 – spec 1

Water Penetration witnessed under the window sill – unit 917 – spec 1

Water Infiltration witnessed at head Glazing Style – unit 917 – spec 2

Water Infiltration witnessed at interlock Glazing Style – unit 917 – spec 2

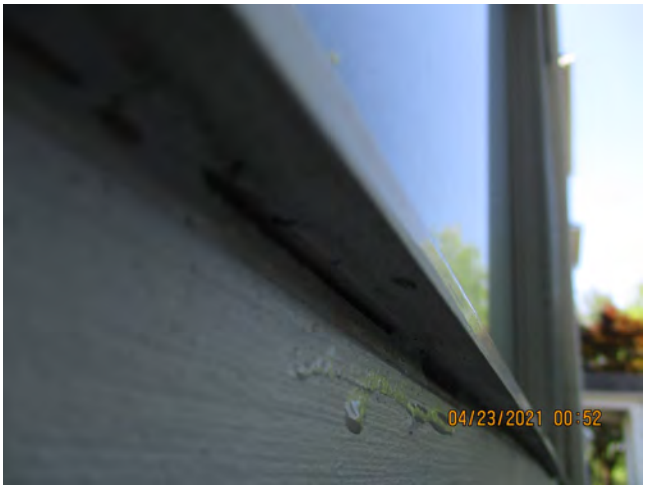
Water penetration was witnessed at the interlocking frame member and sill frame member of window systems tested by the ASTM E-1105 field test.

Water Infiltration witnessed at Interlocking window frame member – unit 917 – spec 3

Water Penetration witnessed under the window sill – unit 917 – spec 3

Exterior Sources of Moisture Penetration Identified

Sources of Water Penetration Identified – Unit 216



Sources of Water Penetration Identified – Unit 216

Sources of Water Penetration Identified – Unit 216

Sources of Water Penetration Identified – Unit 216

Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

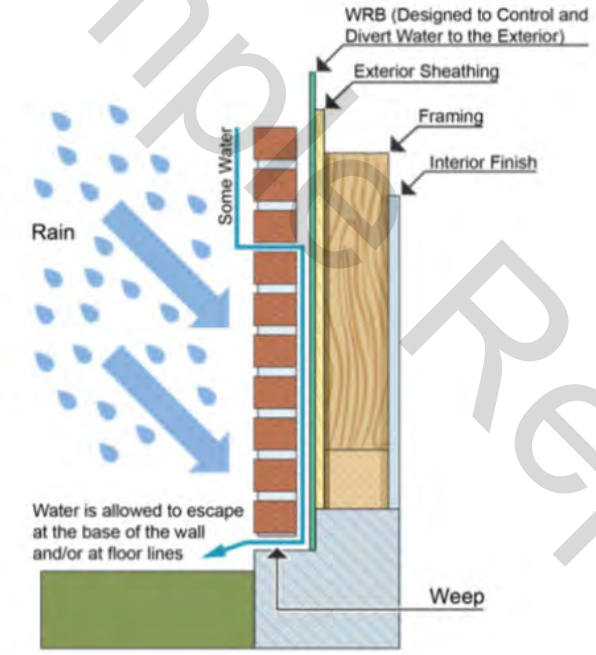
Sources of Water Penetration Identified – Unit 917

Sources of Water Penetration Identified – Unit 917

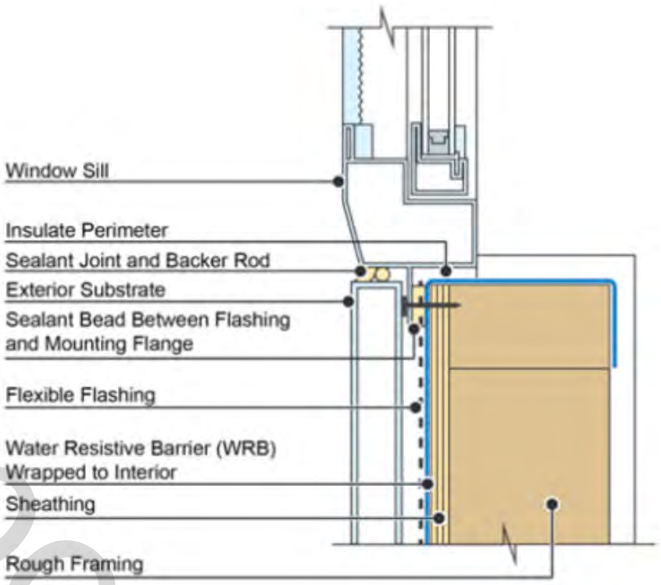
Sources of Water Penetration Identified – Unit 917

Installation and Drainage Plan

The [redacted] wall design concept utilized a Nailing Fin Installation method to integrate within a Membrane/Drainage (WRB) Water Resistant Barrier system. (See the illustrations below.)



Typical Membrane/Drainage Wall System

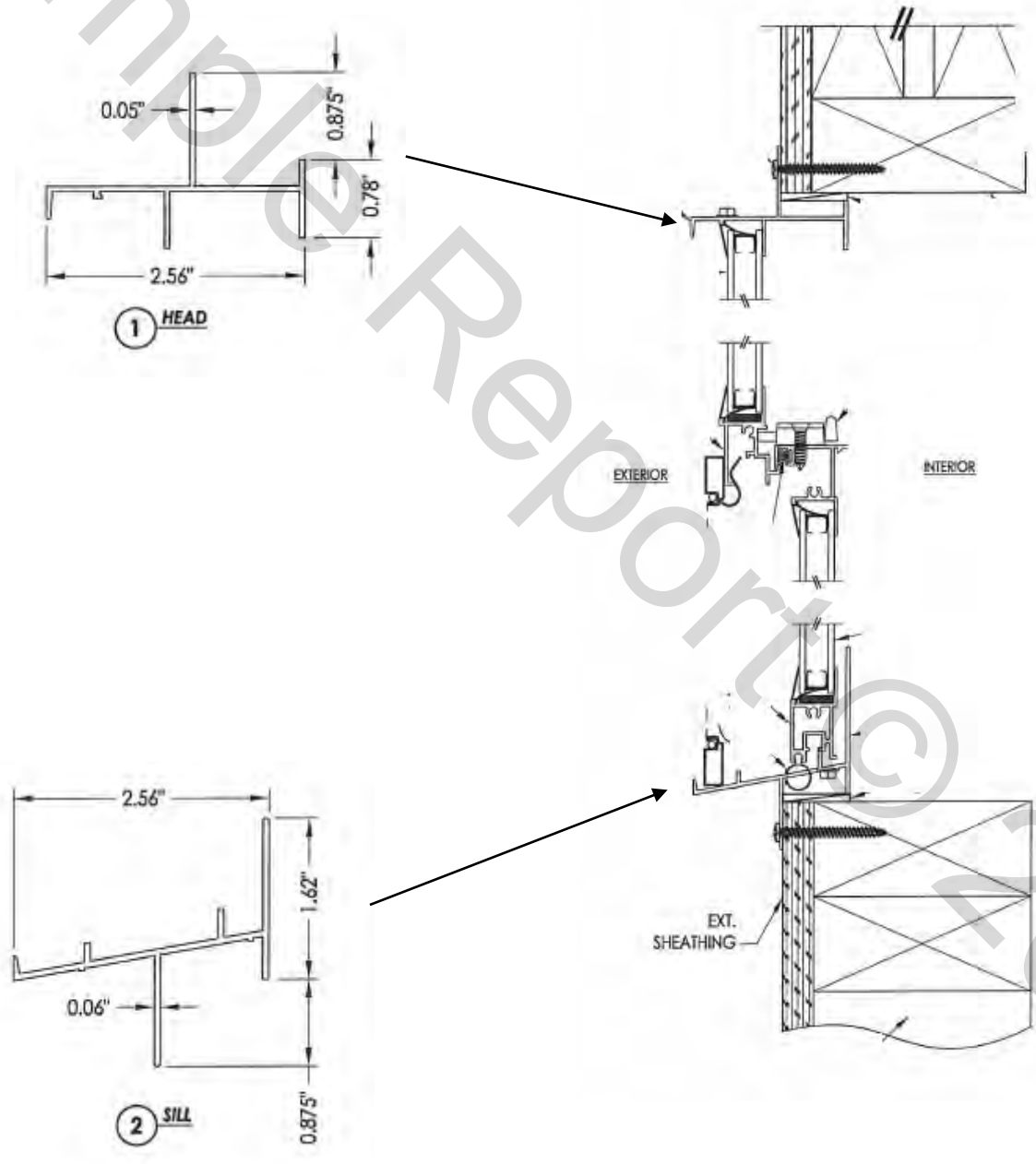


Typical Installation of Fin Window Integrating within a Membrane/Drainage Wall system

The Water Penetration witnessed at the [redacted] shows that the window systems integration to the Water Resistive Barrier is no longer performing its designated function. Water that was supposed to drain to the building's exterior is finding its way into the interior living space.

Below, find the frame Head and Sill frame members and a vertical blow-up of the [redacted] systems.

H-R Window manufactured the original windows. installed at the [redacted]

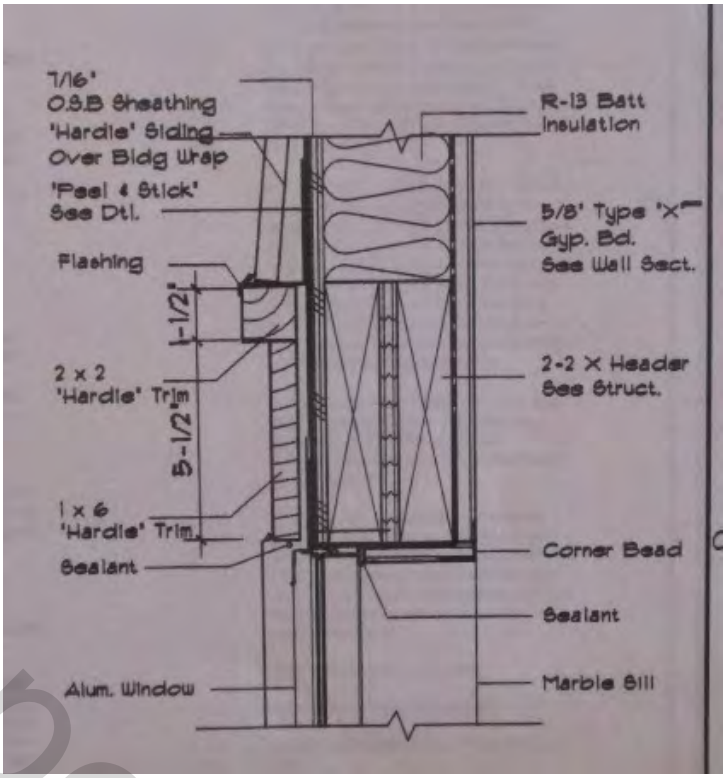


The following diagrams help understand the frame system design and how they integrate with the building's sheathing.

Detail of the Windows Systems installation within the fenestration, integration with the Water Resistive Barrier, and exterior siding "water shedding system."

This section is taken from the Head Frame Member's perspective and it shows the integration / installation protocol laid out by the original specifying Architect.

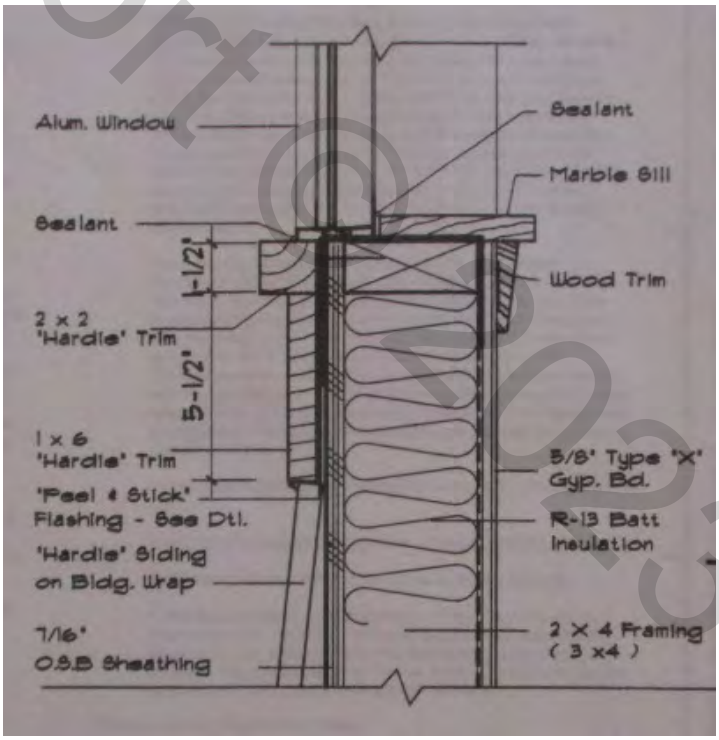
Original Shop Drawings amended by the Glazing Contractor were not available for review at the time of our inspection.



Detail of the Windows Systems installation within the fenestration, integration with the Water Resistive Barrier, and exterior siding "water shedding system."

This section is taken from the Sill Frame Member's perspective and it shows the integration / installation protocol laid out by the original specifying Architect.

Original Shop Drawings amended by the Glazing Contractor were not available for review at the time of our inspection.



From the results of TSSA Storm Safe DAC Inc, E-1105 Water Penetration Testing performed onsite, most water penetration issues experienced at the [redacted] manifested at the Sill of the Single Hung Windows. (see "Testing Results – Water Penetration & Water Infiltration - Page 24."

The "Exterior Sources of Moisture Penetration Identified – Page 28" Damage Section of our findings report shows many openings identified where water can find its way behind the exterior water-shedding system. This uncontrolled water can now potentially breach the Water Resistive Barrier making its way into the interior living space.

Repair Recommendation:

It is the Recommendation of TSSA Storm Safe DAC Inc. to perform a Sealant Repair protocol at the [redacted] to cease the water Penetration that has been experienced.

Sealant Remediation Areas of Concentration

Exterior:

- Between Exterior Aluminum Window Sill and Wood Casing/Trim
- Exterior Lower Jamb to Sill connection interface
- Between Exterior Aluminum Window Sill and Brick Facia
- Wood Casing and Brick Facia
- Between Exterior Aluminum Window Frame and Coronado Stone
- Between Aluminum Window Frame (Head and Jamb) and Casing

Interior:

- Drywall and Aluminum Window Framing

Window Glass Pane:

- Glass Pane to Glazing Style

Exterior – Sealant Remediation Procedural Recommendations:

1. Before a Remedial Sealant protocol is started, we recommend that a qualified contractor remove the exterior casing/trim around the window systems and inspect the condition of the Exterior Flashing, Nailing Fin, and the windows adherence to the OSB Substrate. Repair any issues found that may be an underlying cause of Water Penetration.

2. Replace Casing/Trim around the exterior window systems and proceed with Sealant Remediation Protocol.

3. Have a licensed Engineer/Architect specify the appropriate sealant repair protocol and products with properties that adhere to the different substrates discussed in the "Sealant Remediation Areas of Concentration – Exterior" section of this report.

4. After a few Condominium Units have undergone the sealant remediation protocol, it is the Recommendation of TSSA Storm Safe DAC Inc to re-test a small sample of window systems early in the remediation process to make sure that the sealant repair is properly mitigation any future water penetration issues.

5. If Re-Testing shows that the Sealant Repair Protocol performs its function and protects the building envelope from water penetration, complete the Sealant Repair protocol as specified.

Interior – Sealant Remediation Procedural Recommendations:

1. Check interior drywall reveal around window system with a strong focus under the window sill. If evidence of moisture or mildew/bacterial growth is found, cut away the damaged drywall and replace it with new drywall.

2. If the drywall is removed and access to the window frame and wood studs are visible, use Expandable Foam between the window frame and wood stud to help maintain a water/air-tight building envelope.

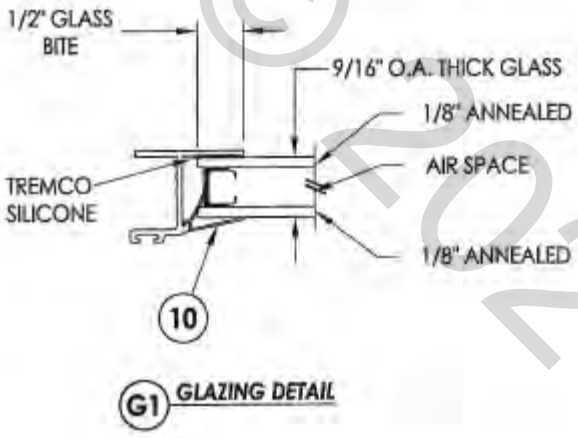
3. Replace Drywall and then Caulk the interior drywall to window frame connection to cease any water from making its way into the interior living space.

Window Glass Pane - DEGLAZING

Another focus of the remediation protocol should consider the deglazing of the glass lite within their installed glazing style.

Upon inspection, TSSA Storm Safe DAC Inc has found several glass lites that are deglazed, allowing exterior water to infiltrate into the interior living space. This physical damage also allows interior Air-Conditioned air to escape to the exterior.

The glazing edge between the aluminum glazing style and the glass pane is used to set the primary glazing seal; in the same manner, the primary seal is set around the installation flange of the window framing system.



It is the recommendation of TSSA Storm Safe DAC Inc. that the [redacted] has a glazing company assess the condition of the installed glass lites and, if necessary, perform remedial reglazing of the glass lites within their glazing style to mitigate further water intrusion.

Limitations – The contents of this report are intended for the use of The [redacted] and its representatives or clients. TSSA Storm Safe DAC Inc. assumes no liability for the misuse of this information by others. The professional opinions and recommendations included within this report are based on the results and interpretations of the invasive testing and the data collection activities performed at the site. TSSA Storm Safe DAC Inc. reserves the right to update this report should additional information become available.

MOISTURE METER TECHNOLOGY – The Ryobi Model # E49MM01 Moisture Meter Gauge and General 4-in-1 Pin/Pad RH Moisture Meter Model # MMH800 were utilized for the sole purpose of the TSSA Storm Safe Inc. inspector to document the presence of moisture in and around the Glazed System Specimen in order to validate his remarks on Moisture Intrusion, Damage, and Penetration. No Microbial, Bacterial, Environmental, or other scientific data was investigated, interpreted, or otherwise implied by the testing, data gathering, and investigation completed with the Ryobi Model # E49MM01 Moisture Gauge or General 4-in-1 Pin/Pad RH Moisture Meter Model # MMH800.

Closing Statement - The opinions authored in this report are a direct result of Ivan Browner (TSSA's President) and TSSA Storm Safe DAC Inc.'s background, training, and combined experience, which spans over 70 years in all facets of the glazing industry. TSSA Storm Safe DAC Inc. has inspected over 500,000 windows, sliding glass doors, curtain walls, storefront systems, and architectural products in multiple states.

As the author of this findings report, the basis for the opinions expressed herein are to a reasonable degree of professional certainty. The TSSA Storm Safe DAC Inc. glazed damage assessment investigation of the [redacted] was performed by the TSSA Storm Safe DAC Inc. Field Inspection Team under my direct supervision.

Attached to this Glazing Testing Report are the following exhibits:

Exhibit A – Field Inspection Notes and Photos
Exhibit B – TSSA Storm Safe DAC Inc. Curriculum Vitae

TSSA Storm Safe DAC Inc. appreciates this opportunity to have assisted The [redacted] with this investigation. Please call if you have any questions concerning this information.

Sincerely,

Ivan Browner

Ivan Browner - FMPC
President
TSSA Storm Safe DAC Inc.

Exhibit A

Field Inspection Notes and Photos

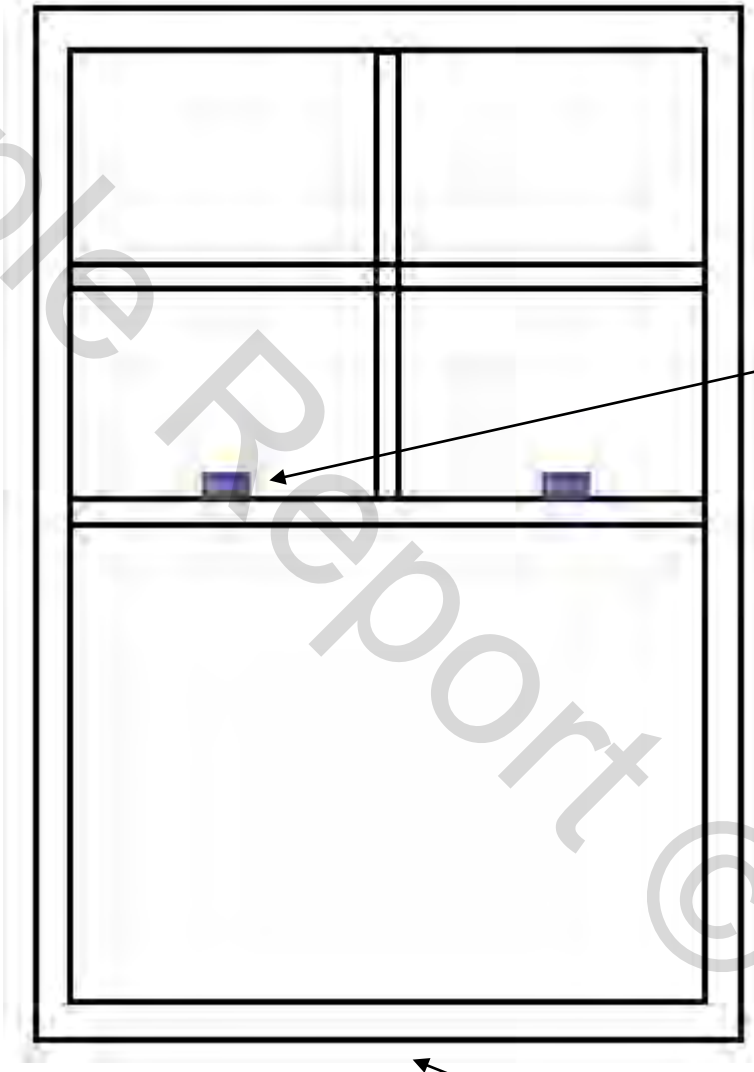
Field Testing Results

Building 2 – Unit 216
Specimen 1

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	2
UNIT #	216
FLOOR #	1
SAMPLE NUMBER:	1
SAMPLE LOCATION	2nd Bedroom
SAMPLE FACING	North
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Inside Br. Pressure	1015.1	hPa
Outside Br. Pressure	1015.1	hPa
Wind Speed: (At Spec:)	9	Mph
Relative Humidity	45%	
Air Temp (Inside:)	60	f
Air Temp (Outside:)	49	f
Start time:	11:02:00	AM
Stop time:	11:13:28	AM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	P	0:05:00
	7.5	12 PSI	0	P	0:01:00
2	7.5	12 PSI	0.65	F	0:03:28
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:11:28



Cycle 2 - Water Infiltration witnessed in IGU of Non-Operational Sash

Cycle 2 – (Failure) 3:28 min Water Penetration witnessed at Sill Frame Member

Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen

Cycle 1 – Chamber Pressure Achieved

Cycle 2 – Chamber Pressure Achieved

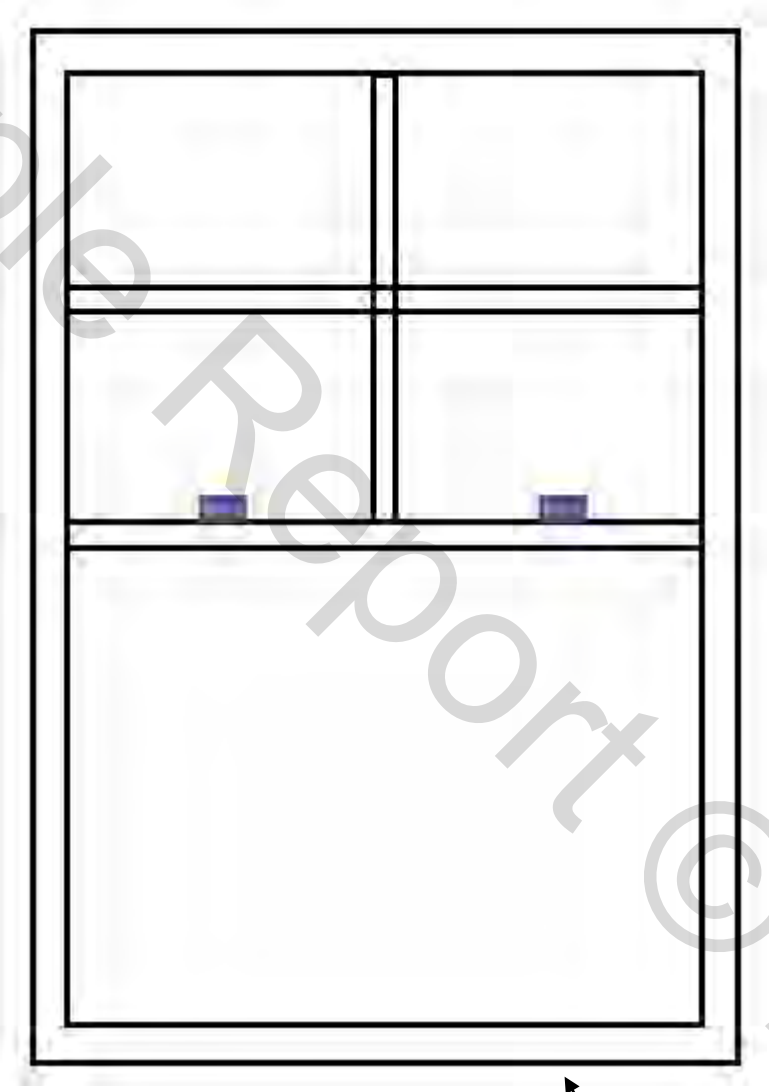
Observing Testing – Looking for water penetration

Building 2 – Unit 216
Specimen 2

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	2
UNIT #	216
FLOOR #	1
SAMPLE NUMBER:	2
SAMPLE LOCATION	Master Bedroom
SAMPLE FACING	North
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Inside Br. Pressure	1015.5	hPa
Outside Br. Pressure	1015.1	hPa
Wind Speed: (At Spec:)	8	Mph
Relative Humidity	38%	
Air Temp (Inside:)	60	f
Air Temp (Outside:)	56	f
Start time:	11:40:00	AM
Stop time:	11:46:54	AM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	F	0:04:54
	7.5	12 PSI	0		
2	7.5	12 PSI	0.65		
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:06:54



Note – Incidental moisture penetration occurred at window next to this specimen from over spray of our spray rack. This second window did not have a vacuum being created during the time of failure.

Cycle 1 – (Failure) 4:54 min Water Penetration witnessed at Sill Frame Member

Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen

Cycle 1 – Chamber Pressure Achieved

Observing Testing – Looking for water penetration

Building 2 – Unit 216
Specimen 3

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	2
UNIT #	216
FLOOR #	1
SAMPLE NUMBER:	3
SAMPLE LOCATION	Living Room
SAMPLE FACING	North
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

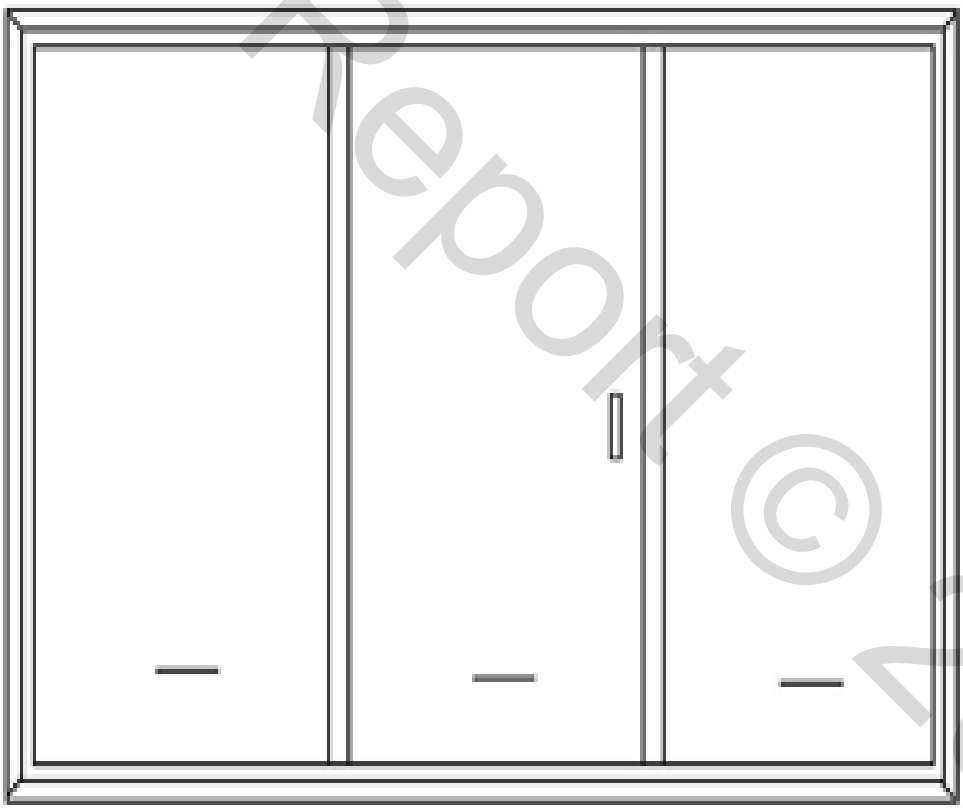
Building 2 Unit 216 spec 3

Inside Br. Pressure	1015.5	hPa
Outside Br. Pressure	1015.1	hPa
Wind Speed: (At Spec:)	8.5	Mph
Relative Humidity	37%	
Air Temp (Inside:)	64	f
Air Temp (Outside:)	59	f
Start time:	14:20:00	PM
Stop time:	14:27:00	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.23	P	0:05:00
	7.5	12 PSI	0	NA	
2	7.5	12 PSI	0.45	NA	
	7.5	12 PSI	0	NA	
3	7.5	12 PSI	0.68	NA	
	7.5	12 PSI	0	NA	
					0:07:00

NA – The final result of one of the systems tested, "Sliding Glass Door" (Building 2 – unit 216 – spec 3), was inconclusive due to the fact that TSSA Storm Safe DAC Inc. inspectors were not able to create a strong enough vacuum pressure within our constructed testing chamber.

This was because there was a great deal of uncontrollable Air Infiltration between the installed Sliding Glass Door System and the Fenestration it was installed within.

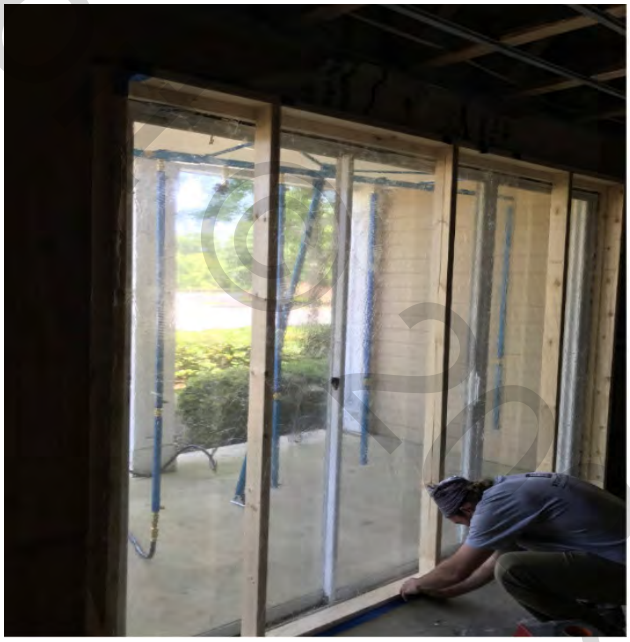


Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen



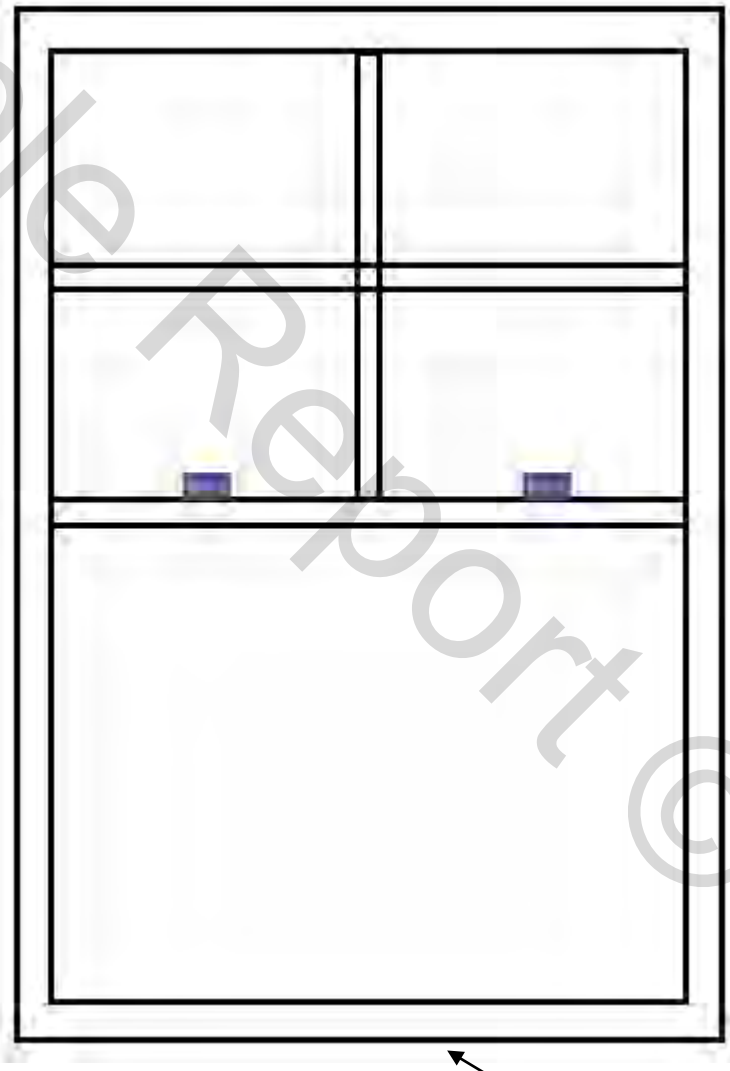
Building 3 – Unit 311
Specimen 1

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	3
UNIT #	311
FLOOR #	1
SAMPLE NUMBER:	1
SAMPLE LOCATION	Master Bedroom
SAMPLE FACING	East
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Building 3 Unit 311 spec 1

Inside Br. Pressure	1012.4	hPa
Outside Br. Pressure	1012.4	hPa
Wind Speed: (At Spec:)	4	Mph
Relative Humidity	26%	
Air Temp (Inside:)	68	f
Air Temp (Outside:)	68	f
Start time:	16:40:00	PM
Stop time:	16:51:31	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	P	0:05:00
	7.5	12 PSI	0	P	0:01:00
2	7.5	12 PSI	0.65	F	0:03:31
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:11:31



Cycle 2 – (Failure) 3:31 min
Water Penetration witnessed
at Sill Frame Member

Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen

Cycle 1 – Chamber Pressure Achieved

Cycle 2 – Chamber Pressure Achieved

Observing Testing – Looking for water penetration

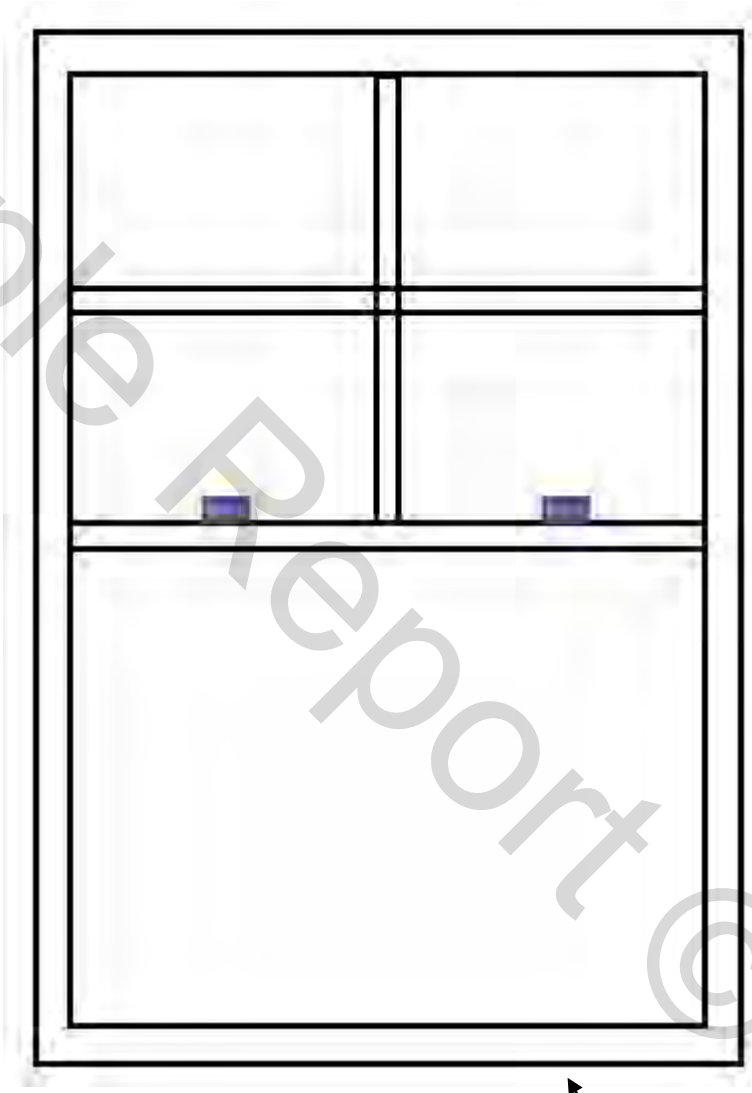
Building 3 – Unit 311
Specimen 2

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	3
UNIT #	311
FLOOR #	1
SAMPLE NUMBER:	2
SAMPLE LOCATION	Master Bedroom
SAMPLE FACING	North
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Building 3 Unit 311 spec 2

Inside Br. Pressure	1012.2	hPa
Outside Br. Pressure	1012.2	hPa
Wind Speed: (At Spec:)	3	Mph
Relative Humidity	23%	
Air Temp (Inside:)	68	f
Air Temp (Outside:)	68	f
Start time:	17:23:00	PM
Stop time:	17:29:59	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	F	0:04:59
	7.5	12 PSI	0		
2	7.5	12 PSI	0.65		
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:06:59



Cycle 1 – (Failure) 4:59 min
Water Penetration witnessed
at Sill Frame Member

Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen

Cycle 1 – Chamber Pressure Achieved

Observing Testing – Looking for water penetration

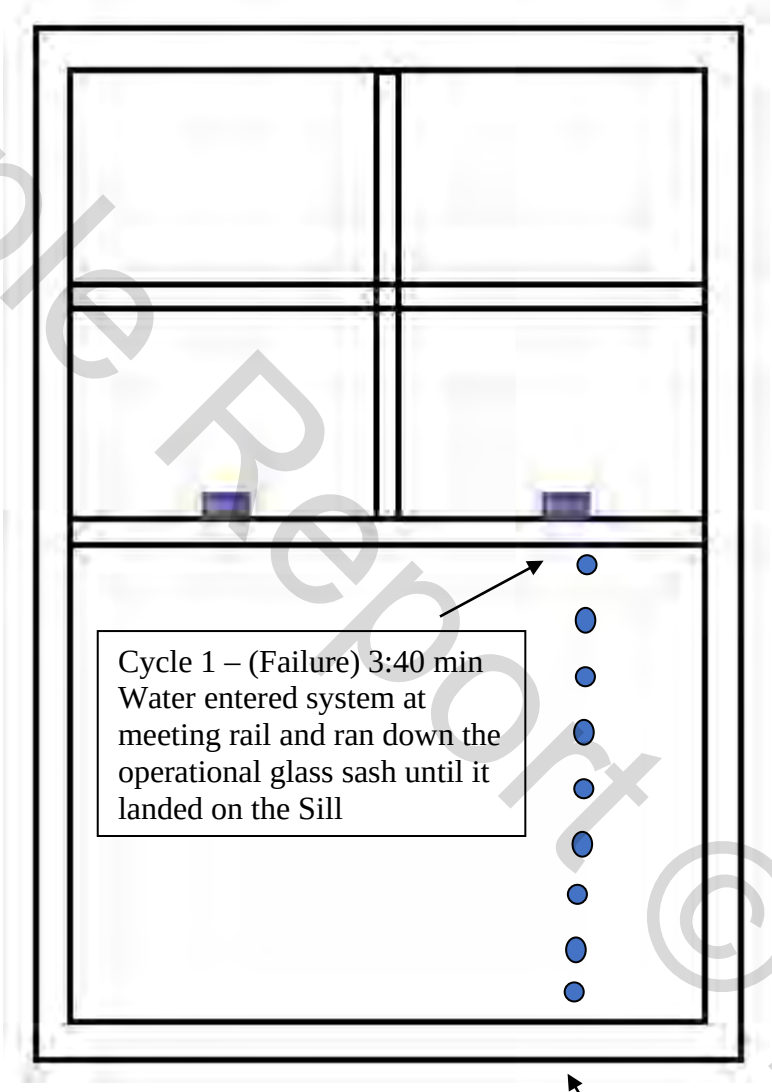
Building 3 – Unit 311
Specimen 3

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	3
UNIT #	311
FLOOR #	1
SAMPLE NUMBER:	3
SAMPLE LOCATION	2nd Bedroom
SAMPLE FACING	North
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Building 3 Unit 311 spec 3

Inside Br. Pressure	1012.3	hPa
Outside Br. Pressure	1012.3	hPa
Wind Speed: (At Spec:)	3	Mph
Relative Humidity	24%	
Air Temp (Inside:)	68	f
Air Temp (Outside:)	68	f
Start time:	18:05:00	PM
Stop time:	18:10:40	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	F	0:03:40
	7.5	12 PSI	0		
2	7.5	12 PSI	0.65		
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:05:40



Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen

Cycle 1 – Chamber Pressure Achieved

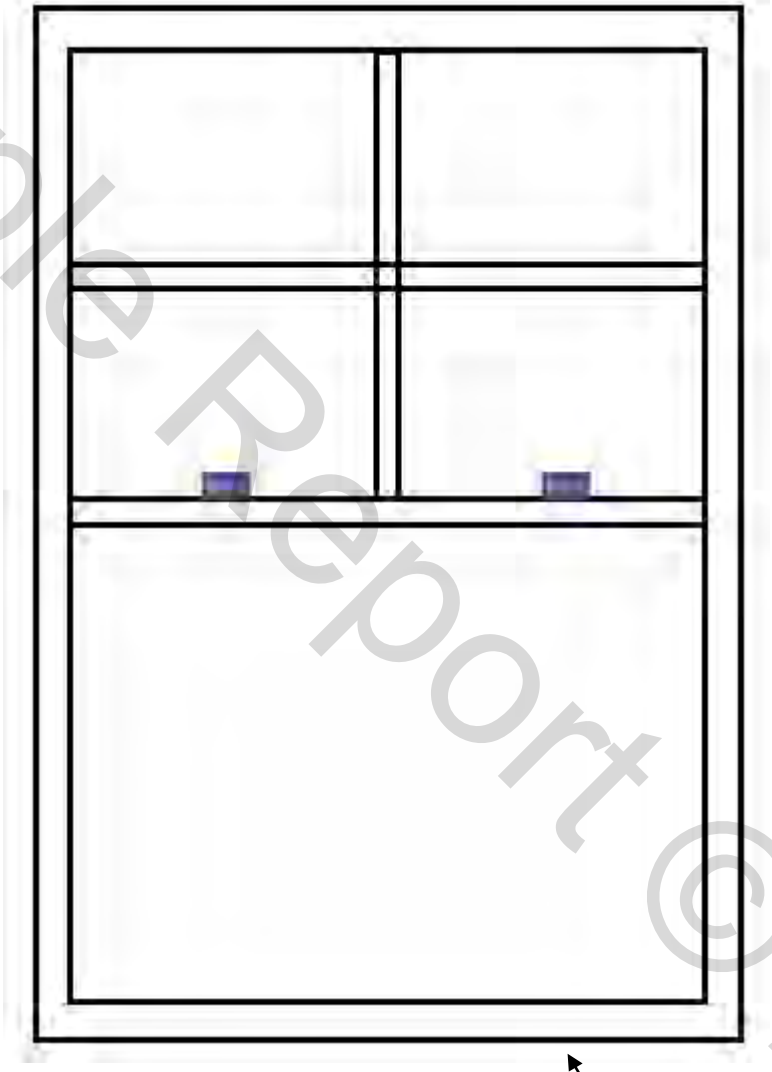
Building 9 – Unit 917
Specimen 1

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	9
UNIT #	917
FLOOR #	1
SAMPLE NUMBER:	1
SAMPLE LOCATION	Master Bedroom
SAMPLE FACING	East
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Building 9 Unit 917 spec 1

Inside Br. Pressure	1014.4	hPa
Outside Br. Pressure	1014.4	hPa
Wind Speed: (At Spec:)	8	Mph
Relative Humidity	49%	
Air Temp (Inside:)	68	f
Air Temp (Outside:)	68	f
Start time:	11:59:00	AM
Stop time:	12:08:44	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	P	0:05:00
	7.5	12 PSI	0	P	0:01:00
2	7.5	12 PSI	0.65	F	0:01:44
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:09:44



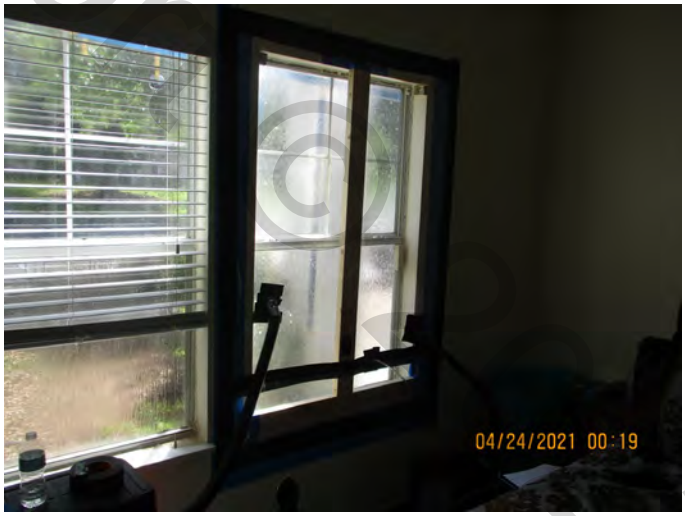
Cycle 2 – (Failure) 1:44 min
Water Penetration witnessed
at Sill Frame Member

Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen



Cycle 1 – Chamber Pressure Achieved

Cycle 2 – Chamber Pressure Achieved

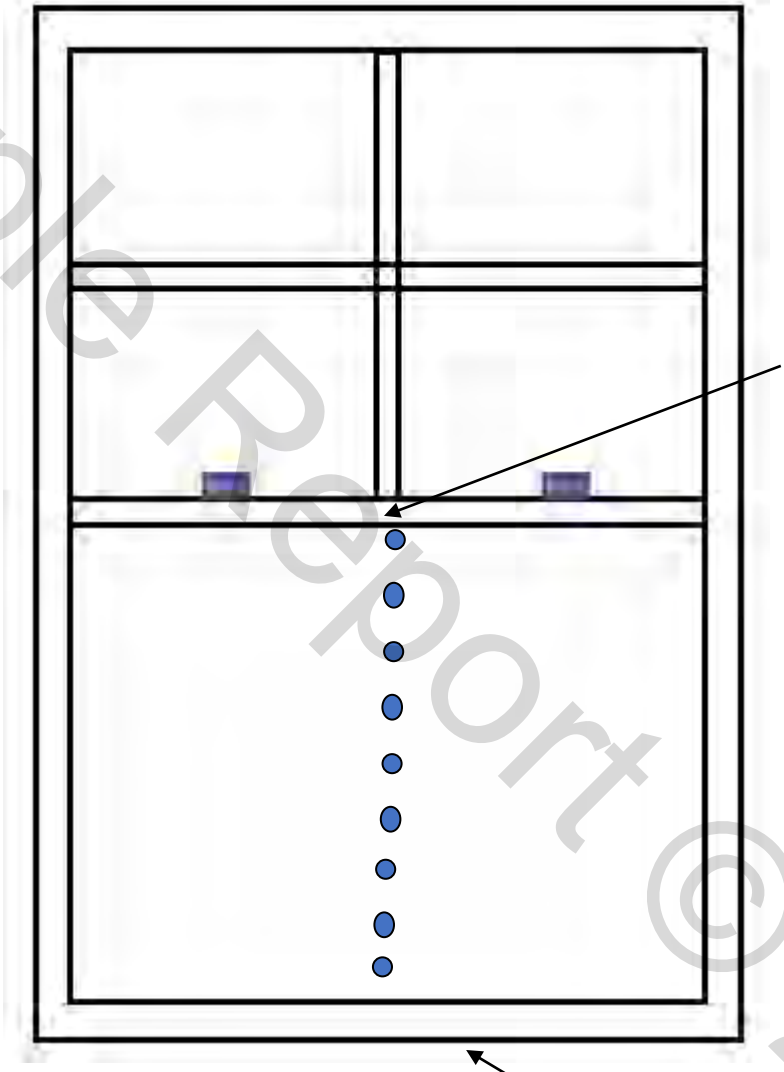
Building 9 – Unit 917
Specimen 2

PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	9
UNIT #	917
FLOOR #	1
SAMPLE NUMBER:	2
SAMPLE LOCATION	Living Room
SAMPLE FACING	East
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Building 9 Unit 917 spec 2

Inside Br. Pressure	1014.4	hPa
Outside Br. Pressure	1014.4	hPa
Wind Speed: (At Spec:)	7	Mph
Relative Humidity	49%	
Air Temp (Inside:)	68	f
Air Temp (Outside:)	68	f
Start time:	13:41:00	PM
Stop time:	13:51:26	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	P	0:05:00
	7.5	12 PSI	0	P	0:01:00
2	7.5	12 PSI	0.65	F	0:02:26
	7.5	12 PSI	0		
3	7.5	12 PSI	0.97		
	7.5	12 PSI	0		
					0:10:26



Cycle 2 - Water Infiltration witnessed at Interlocking Meeting Rail

Note – Incidental moisture penetration occurred at window next to this specimen from over spray of our spray rack. This second window did not have a vacuum being created during the time of failure.

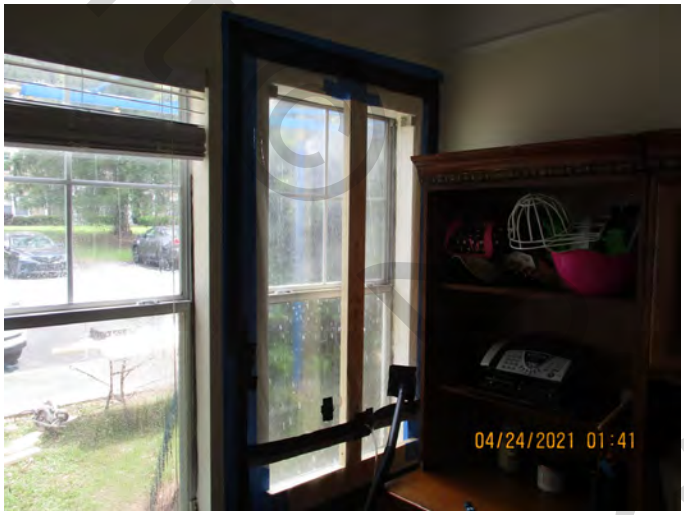
Cycle 2 – (Failure) 2:26 min Water Penetration witnessed at Sill Frame Member

Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen



Cycle 1 – Chamber Pressure Achieved

Cycle 2 – Chamber Pressure Achieved

Building 9 – Unit 917
Specimen 3

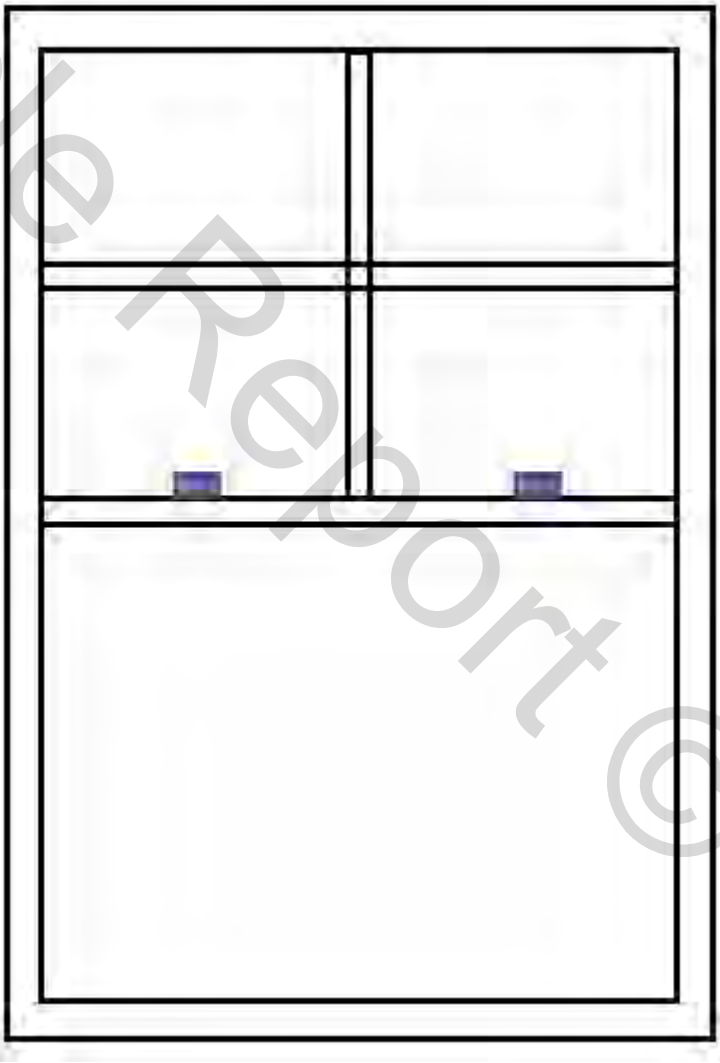
PROJECT NAME:	[redacted]
ADDRESS:	[redacted]
CITY, STATE, ZIP:	Tallahassee, Fl
STANDARD FOLLOWED	
ASTM E-1105	
METHOD A – UNIFORM STATIC	
METHOD B – CYCLIC STATIC	X
AAMA 511	
BLDG #	9
UNIT #	917
FLOOR #	1
SAMPLE NUMBER:	3
SAMPLE LOCATION	3rd Bedroom
SAMPLE FACING	North
PROJECT DIRECTOR	Ivan Browner
TECH #1	Richard Orhood
TECH #2	Steven Browner
TECH #3	

Building 9 Unit 917 spec 3

Inside Br. Pressure	1013.9	hPa
Outside Br. Pressure	1013.9	hPa
Wind Speed: (At Spec:)	8	Mph
Relative Humidity	33%	
Air Temp (Inside:)	79	f
Air Temp (Outside:)	74	f
Start time:	12:46:00	PM
Stop time:	13:10:00	PM

Window Obervation Cycle Number:	Flow Rate (Gal/min)	Water Pressure (PSI)	Vacuum Pressure (in of H^2O)	Pass/Fail	Time
Baseline	7.5	12 PSI	0	P	0:02:00
1	7.5	12 PSI	0.32	P	0:05:00
	7.5	12 PSI	0	P	0:01:00
2	7.5	12 PSI	0.65	P	0:05:00
	7.5	12 PSI	0	P	0:01:00
3	7.5	12 PSI	0.97	P	0:05:00
	7.5	12 PSI	0	P	0:05:00
					0:24:00

Note – This Specimen is a Pass
No moisture penetration was witnessed during each of the three testing cycles.



Spray Rack Water Pressure showing 12 PSI

Spray Rack Nozzles 20” from test specimen

Spray Rack Nozzles 24” from each other

Testing Chamber on Interior of test specimen

Cycle 1 – Chamber Pressure Achieved

Cycle 2 – Chamber Pressure Achieved

Cycle 3 – Chamber Pressure Achieved

Checking for Water Penetration