Woods Engineering, Inc.

March 26, 2025

Ms. Lori Brick
Tidesfall Condominium Management Association
395 S. Atlantic Avenue
Ormond Beach, Florida 32176

Subject: **Report of Limited Building Envelope Assessment**
Tidesfall Condominium
395 S. Atlantic Avenue
Ormond Beach, Florida
WEI Project 25-1835

Dear Ms. Brick:

We have completed our limited building envelope assessment of the residential condominium structure located at 395 S. Atlantic Avenue in Ormond Beach, Florida. The purpose of our services was to perform an assessment of conditions related to water intrusion at windows and doors during significant storm events. Our services were performed in accordance with our Proposal and Authorization for Professional Services dated January 9, 2025 and authorized by the Association on January 14, 2025. This report summarizes the results of our findings.

Project Information

Project information was provided by you through electronic and telephone conversations. We understand water intrusion has occurred previously during significant storm events related to the window and door systems primarily on the 06 stack units. You requested that we visit the site to observe and document the conditions for the purpose of performing this limited building envelope assessment and to provide our opinion regarding the suitability of the windows and doors for continued use.

According to the Volusia County Property Appraiser, the building was originally constructed around 1982. The building is nine stories in height and is constructed primarily of reinforced concrete construction. Exterior walls are covered with direct applied stucco. The low slope roof is covered with a modified bitumen membrane with a silicone coating applied on or around 2018.

Observations

A site visit was made by Bryan Busse, P.E. on February 13, 2025. Observations were limited to accessible portions of representative unit interiors, associated balconies, and portions of the roof. Representative photographs taken at the time of our visit are attached. Units entered included 406 and 706 where prior water intrusion has been reported. The site visit was accompanied by board members, the property manager, and maintenance personnel. Additional project information was gained from those present during our site visit.

At the time of our visit, the flooring of Unit 406 had been removed adjacent to the northeast facing sliding glass door and the adjacent set of east elevation windows. The wood subfloor showed signs of moisture damage adjacent to the door and under the windows. The window system was observed to consist of fixed and casement style vinyl or vinyl clad windows combined with vertical and horizontal mullions. Weather stripping is provided at two locations of the operable casement sashes. The outer stripping is installed on the frame and seals to the sash. The inner stripping is installed on the operable sash and seals to the inside face of the frame. At the time of our visit the outer stripping appeared moderately deteriorated from UV exposure, but the inner stripping was in good condition. It was reported that Association maintenance has the ability to replace the weather stripping if requested by the unit owner. It appears the inner stripping of the east elevation casement windows of Unit 406 has been recently replaced.

The sliding glass door is similar in construction to the casement windows and consists of vinyl or vinyl clad materials. The door is not a traditional sliding door where the operable panel is set on rollers in a track, but rather the operable panel is on a hinge that pulls the door away from the track when it is moved to the sides. The weather stripping is similar to the casement windows in that an outer strip is mounted to the frame and an inner strip is mounted to the operable door panel. The inner and outer door weather stripping of the northeast elevation door in Unit 406 was observed to be in good condition and has apparently been replaced in the last few years.

Maintenance personnel reported the doors and windows were manufactured by Roto and were installed on or around 2006. The design of the system relies on compression of the two sets of weather stripping to resist water penetration. The systems require the operable portions to be fully latched to operate properly with respect to water penetration resistance. The interior pane of the glazing provided appears to be impact resistant based on sounding of the material. No labeling or other indicators of the product design pressure were observed.

Balcony observations showed the sliding glass doors are installed on an approximately 2-inch curb, sealants are in fair to good condition, and the door weeps are not blocked and appear functional.

Water intrusion has also been reported within Unit 706 which is a two-story unit. Water intrusion related to conditions at the southeast facing second floor door of the unit has caused damage to nearby closet ceilings of the ground floor of Unit 706 and units below. The liquid applied balcony slab coating adjacent to the door was reportedly replaced approximately two years ago. The weather stripping of the doors in Unit 706 appeared to be in good condition. The water intrusion resulting in the closet damage appears to convey from the southeast door under the flooring materials based on the observable conditions.

The direct applied stucco of the walls adjacent to the referenced unit 706 doors appeared to be in fair to good condition with no observable indicators of significant sources of water intrusion. Building sealants (stucco to window and door frames) appeared to be in fair to good condition. The building was last painted approximately six years ago and is scheduled for repainting next year. A fixed and non-operable window on the east elevation near the southeast door was observed to have glazing (glass) sealants in poor condition; however, the water intrusion observed and reported does not appear to be related to the glazing sealant condition.

The roof system above unit 706 was accessed and observed for conditions related to potential water intrusion. No significant observable defects were identified in the roof or roof transitions in the area.

Gutters installed after original construction for the purpose of collecting water runoff from the Unit 706 upper floor balconies (from through wall scuppers) have become detached due to winds from a prior storm event. A portion of the associated downspout was also observed to be missing.

Conclusions

Based on the observable conditions at the time of our visit, in our opinion and within a reasonable degree of engineering certainty, the window and door systems do not appear to be defective; however, do appear to be the most likely contributing source of the water intrusion that has occurred in the observed units. Water intrusion reportedly does not occur during normal rain events, but rather occurs during significant events that include high wind speeds such as hurricanes and significant tropical storms. The window and door systems as manufactured rely on compression of the weather stripping to resist water penetration. Significant positive wind pressure acting inward on the systems can reduce the compression of the weather stripping and result in water penetration.

Although the windows and doors allow water penetration during significant wind events, the systems do not appear to be defective. Window and door systems are designed and manufactured to resist wind pressures based on prescribed wind speeds for the building locale. The systems are required to resist the full design pressure acting inward and away from the building (negative suction) with respect to the structural integrity and attachment to the building. The systems are required to resist 15% of the full positive design pressure with respect to water penetration resistance. As such, windows and doors are designed to resist water penetration at a lower wind speed as compared to the structural requirements.

The American Architectural Manufacturer's Association (AAMA) is the industry recognized association with respect to building code requirements and guidance with respect to the design, manufacture, and installation of window and door assemblies. AAMA provides guidelines and testing requirements for the proper performance of fenestration products. AAMA produced a document titled *"Storm-Driven Rain Penetration of Windows and Doors,"* dated November 28, 2005 to provide further clarification with respect to structural versus water penetration performance. The AAMA document is included as an attachment to this report. Based on the current building code wind speed velocity requirements for the building locale (V=136 mph) and pressures determined in accordance with ASCE 7-22, we estimate the positive design pressure rating of the windows and doors at the site should be 40 to 45 psf. Per the AAMA document, this approximately equates to a wind speed equivalent for water penetration resistance of 49 to 51 mph.

With respect to water penetration resistance based on the AAMA approximations and assumed design pressures, the windows and doors are anticipated to allow water penetration when wind speeds exceed 49 to 51 mph. Similar water penetration performance would be expected if new windows and doors of the equivalent design pressure rating were installed.

Many of the units at Tidesfall were observed to have hurricane shutters installed. It was reported that no water penetration occurs during storm events within the units when the shutters are closed. For the purpose of mitigating water intrusion during high wind events, we recommend installing hurricane shutters on all units and ensuring they are closed during wind events expected to exceed 50 mph.

The failure of the gutter at unit 706 nor the stucco or roof systems appear to be contributing to the water intrusion at units 406 and 706 based on the observable conditions.

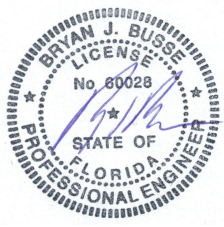
We recommend continued maintenance of the window and door weather stripping gaskets to include replacement where they are found to be cracked and deteriorated. Building sealants should be removed and replaced during the regularly scheduled painting maintenance work. Where fixed windows include glazing sealants, the glazing sealants should also be removed and replaced.

Our conclusions are based on information obtained from the Association, maintenance personnel, and our limited nondestructive field observations. No window or door water penetration testing was performed as part of these services. Our opinions are made within a reasonable degree of engineering certainty. Any conditions or project documentation discovered which deviate from the information presented in this report should be presented for our review.

We appreciate the opportunity to provide our professional services and look forward to continuing our relationship. If we can be of any further assistance, please do not hesitate to call.

Sincerely,

Woods Engineering, Inc.
FBPE Certificate of Authorization 26428



Digitally signed
by Bryan J Busse
DN: cn=Bryan J
Busse c=US
o=Florida
Date: 2025-03-28
11:08-04:00

Bryan J. Busse, P.E.
Principal Engineer
Licensed, Florida 60028

Attachments: Representative Photographs
AAMA Storm Driven Rain Penetration of Windows and Doors

This item has been digitally signed and sealed by Bryan J. Busse, P.E. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Photograph 1
Unit 406 Flooring Removed and Subfloor Staining at Sliding Door

Photograph 2
Unit 406 Flooring Removed and Subfloor Staining under Windows

Photograph 3
406 Casement Window Outer Weather Stripping

Photograph 4
406 Casement Window Inner Weather Stripping

Photograph 5
Unit 406 Inner and Outer Weather Stripping Indicated

Photograph 6
Unit 406 Exterior Door Curb and Sealants, Door Weeps Remain Open

Photograph 7
Hurricane Shutters Installed on Multiple Units

Photograph 8
Unit 706 First Unit Level Closet Ceiling Damage

Photograph 9
Unit 706 Upper Level Southeast Door Weather Stripping in Good Condition

Photograph 10
Unit 706 Upper Level Southeast Door Relatively New Deck Coating

Photograph 11
Unit 706 Upper Level East Elevation Fixed Window Building Sealant in Good Condition, Glazing Sealant in Poor Condition

Photograph 12
Displaced Gutter (Missing) Unit 706 under Scuppers

Photograph 13
Silicone Coated Modified Bitumen Roof Over 706 in Good Condition

Photograph 14
Silicone Coated Modified Bitumen Roof Over 706 in Good Condition, No Leaks Reported at Skylight

American
Architectural
Manufacturers
Association

Storm-Driven Rain Penetration of Windows and Doors

Purpose of this Document

In the aftermath of tropical storms and hurricanes, questions have been raised by some residents who experienced wind-driven rain leaking through or around their windows and doors that otherwise remained unbroken and structurally intact during these extraordinary events. AAMA has chosen to publish this document in order to provide information to homeowners, distributors, and builders as well as code officials regarding water penetration during severe wind-driven rain storms.

Actual source of water entry

Rain driven by high winds may enter the wall cavity of a home or building at any number of points, some well above the location at which it appears, such as the attic or roof, soffit or wall penetrations such as exhaust fans. Running down the inside of the wall, it may exit the wall around the rough opening at a window or door.

Installation

Even though the window was properly anchored for structural integrity, it may leak if not correctly flashed and sealed. Windows and doors that are not installed plumb, square, and in plane will not close properly. This leaves gaps which, though very small, are sufficient to admit rain when driven by storm-force winds.

Maintenance

The age of the window or door, condition of seals and weatherstripping, and other maintenance matters such as clogged drainage/weep holes, can contribute to leaks appearing during wind-driven rain conditions. All windows and doors should be regularly inspected for damage or wear, and repaired as needed.

Ratings

Windows and doors are usually selected for their structural performance characteristics based on local or State building code requirements. The primary consideration is structural integrity of the window or door, to keep it intact and prevent the pressure of high-velocity wind from entering the building and causing catastrophic structural damage. In tropical storms and hurricane wind-driven rain conditions the product selected to meet the state and local code requirements may still experience water leakage because these extraordinary conditions exceed the rated/code requirements for water penetration. The tables on the back of this page provide information to help understand how extreme environmental conditions may cause water leakage.

TABLE 1

Water Test Pressure Equivalent Wind Velocities for Windows Tested to the Nationally-Recognized Standard [1]

Design Pressure Rating	Water Test Pressure [2]	Approximate Wind Speed Equivalent to Water Test Pressure [3]
15 psf	2.86 psf	33 mph
20 psf	3.00 psf	34 mph
25 psf	3.75 psf	38 mph
30 psf	4.50 psf	42 mph
35 psf	5.25 psf	45 mph
40 psf	6.00 psf	49 mph
45 psf	6.75 psf	51 mph
50 psf	7.50 psf	54 mph
55 psf	8.25 psf	57 mph
60 psf	9.00 psf	59 mph
65 psf	9.75 psf	62 mph
70 psf	10.50 psf	64 mph
75 psf	11.25 psf	66 mph
80 psf	12.00 psf	68 mph
85 psf	12.75 psf [4]	71 mph
90 psf	13.50 psf [4]	73 mph
95 psf	14.25 psf [4]	75 mph [5]
100 psf	15.00 psf [4]	77 mph [5]

[1] 2003 International Residential Code® for One- and Two-Family Dwellings

[2] Applies to R, LC, C, and HC performance class windows & doors (15% of design pressure; minimum 2.86 psf; max 12 psf); AW performance class is tested for water penetration at 20% of design pressure.

[3] Pressure/Velocity conversions are based on a standard engineering equation; not to be used for code compliance.

[4] For comparison only; the national standard caps water test pressure at 12 psf

[5] This test exceeds the minimum Saffir-Simpson wind velocity for a category one hurricane

Summary

Many window and door products are tested for water penetration resistance at wind pressures as shown in Table 1. When rain events are coupled with extraordinary wind speeds, it is not uncommon to experience water leakage through or around a window or a door. Water resistance performance of a window or door product is often affected by a variety of design parameters including operational or functional concerns, market or economic preferences, life safety and egress codes, or other physical limitations to water control capacity.

Released: November 28, 2005