

6 CONCLUSIONS

The 2019 Workgroup report documented economic losses from water intrusion faced by high-rise residential homeowners in Florida. It revealed reasonably large water damage claims and patterns of water leaks associated with a minimal hurricane. The wind speeds in Hurricane Irma were well below design wind speeds in the Florida Building Code. Those losses suggest a much greater problem due to water leakage will occur if the South Florida were to be struck by a design-level hurricane.

This study discussed and made recommendations about the water-penetration resistance of fenestration assemblies only. There are many other building components that are also impacted by wind-driven rain. The Research Team recommends FBC support future research studies to evaluate water penetration resistance of other components of the building envelope system (as outlined above) during design-level hurricanes. The level of acceptance of Florida homeowners to experience some leakage in design-level hurricanes should be determined.

A prudent course of action for the Florida Building Condition would be to research the feasibility of achieving leak-proof building cladding systems and offering consumers better guidance on current water penetration resistance of existing fenestration assemblies at design-level hurricanes. While in today's climate a leak-proof façade under all conditions may be impossible to achieve, consideration of the testing methods for higher-performance products will inform a performance-based design methodology for water penetration resistance.

The efforts of the Florida Public Hurricane Loss Model have resulted in catastrophe models which can estimate the impact of water damage over a portfolio of buildings. Once the FPHLM model is properly calibrated it may be able to provide a first-cut estimate of potential economic loss and the extent of the problem..

The FBC can assist in improving the communication of the vulnerabilities that high-rise building may face in future design-level hurricanes FBC should support developing consumer information packages of best practice to reduce water intrusion during all phases of design and construction. In addition, the information provided herein may be used as a resource for future building code development.

The research team recommends the FBC consider working with FEMA Mitigation Assessment Teams and develop survey methods to collect and evaluate water penetration (leaks) data from high-rise residential buildings during future hurricanes. This will enable better assessment of whether and how widespread are the systemic water leak-related problems in our high-rise residential buildings at the design-level hurricane.

The Florida Building Commission is well-positioned to encourage on-going collaboration and discussion among the many parties that have an interest in building performance, not least of which are the Florida homeowners. The deliberations of the Research Advisory Group (manufacturers, building officials, engineers and homeowners) outside of the building code-writing forum itself, provided knowledge that is useful for making state-wide longer-term plans and setting the general direction. There are no simple solutions and the problem itself remains somewhat abstract until it is more clearly defined. Other recommendations include the following:.

- Recommendations for future research studies and Round Tables to ensure other aspects (design, installation, testing and administration) are addressed for the building cladding systems, joint sealant systems and waterproofing systems.
- The studies can be tackled serially via annual sponsored research or they can be done in parallel with two or three round tables at once.
- Continue augmenting and disseminating the lists of known enhanced design features that perform well to improve water penetration resistance of fenestration assemblies.
- Improve education materials available for consumers from the industry and other stakeholders, perhaps in collaboration with the Florida Building Commission (or other trusted source.)
- Develop hurricane performance criteria for water penetration resistance that exceeds current industry accepted performance levels established by AAMA/WDMA/CSA 101/I.S.2/A440 North American Fenestration Standard (NAFS).
- Review past “successful” installations that have survived hurricane events and learn what we can from those installations and assemblies and use that information to enhance design criteria and add to the design features list.
- Require improved inspection protocols to consider fenestration installation and integration with the remainder of the building envelope.
- Require testing both before and after construction completion to inform expected levels of water penetration resistance and how that relates to wind speed.
- Develop guidelines for long-term maintenance of fenestration products.
- Conduct full-scale in-situ and/or laboratory water penetration tests to establish the performance level criteria for water penetration resistance of building envelope systems,