5/3/2023

Rick Tsay
2301 Normandy Drive
Miami Beach, FL, 33141

c/o Jamie Straz
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E j@studio3.space

RE: International Inn – Resilient Review
Brizaga Project No. 223006.00

Dear Mr. Straz,

We at Brizaga thank you for the opportunity to provide a Resilient Review of the International Inn, a hotel undergoing rehabilitation located at 2301 Normandy Drive in Miami-Dade County, Florida. This letter will provide you with a comprehensive review of storm surge preparedness and design standards for the proposed development. What follows is a summary of the findings and recommendations to ensure the resilience of the building against potential flooding-based natural disasters.

Should you have any questions or require additional information, please do not hesitate to contact me via email at michael@brizaga.com or at (954) 834-3533.

Sincerely,

Michael Antinelli, PE, CFM
Principal & Co-Founder

Documents Provided by Client

A Schematic Space Plan dated February 2023 was utilized for this review. Elevation certificates for the various areas of the property were also furnished by the Client. A site visit walkthrough was conducted to review the site conditions and discuss the general plans with the Client.

Storm Surge Elevations

As the site is located on the waterfront on a barrier island, the International Inn is at an elevated risk of storm surge flooding from storms like hurricanes. Storm surge elevations were evaluated based upon the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model by NOAA, which indicates the worst-case flooding scenario, also known as the Maximum of Maximums (MoM), storm surge event for each category storm. Based on the outputs from the SLOSH model, the project vicinity is currently at risk from the worst-case Category 2, 3, 4, and 5 storms. These storm surge elevations are presented in Table 1 below.

Storm Category	**2023 Surge Elevation (ft. NAVD88)**	**2040 Surge Elevation (ft. NAVD88)**	**2070 Surge Elevation (ft. NAVD88)**
Category 2	5.4’	6.19’	8.06’
Category 3	7.1’	7.89’	9.76’
Category 4	9.7’	10.49’	12.36’
Category 5	11.1’	11.89’	13.76’

Table 1. Storm surge flooding heights (in feet, NAVD88), for various category storms.

The International Inn’s existing Finished Floor Elevation (FFE) of 4.0 feet NAVD places the building at risk of flooding during storm surge events. According to the Flood Insurance Rate Map (FIRM) in the project vicinity, the International Inn is located within the AE flood zone which is part of the Special Flood Hazard Area. This means that the Inn is at a heightened risk of being impacted by a 100-year flood event (or a flood that has a 1% chance of being exceeded in any given year).

Figure 1. FEMA Flood Insurance Rate Map (FIRM) in the Project vicinity.

The base flood elevation (BFE) at the International Inn is 8 feet NGVD29, or 6.44 feet NAVD88. This means that the 100-year flood event is expected to cause 2.44 feet of flooding within the interior of the property, if not otherwise mitigated.

FEMA maps for Miami-Dade County are currently undergoing revisions, and preliminary maps have been published though not yet adopted. The BFE for the subject property is expected to change to 7 feet NAVD. This means that once the preliminary Flood Insurance Rate Maps are adopted, the 100-year flood event will be expected to cause 3.0 feet of flooding within the interior of the property, if not otherwise mitigated. In Miami Beach the Design Flood Elevation (DFE), or the elevation at which they have new buildings built up to, is one foot above the BFE. This DFE for these new preliminary figures would be 8 feet NAVD, providing additional safety from flooding.

Historic Property Exemptions

According to the National Flood Insurance Program (NFIP), communities may exempt historic buildings from NFIP substantial improvement and substantial damage requirements in either of two ways. First, they can exempt them through their definition of substantial improvement. Second, they can issue variances for historic structures.[1]

Chapter 54 of the Miami Beach Code of Ordinances specifically carves out historic structures as exempt from floodplain requirements when substantial improvements are made. The term (substantial improvement) "… does not include any alteration of an existing historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure."[2]

[1]https://www.fema.gov/pdf/floodplain/nfip_sg_unit_8.pdf
[2]https://library.municode.com/fl/miami_beach/codes/code_of_ordinances?nodeId=SPAGEOR_CH54FL

Flood Protection Alternatives

Generally, flood protection systems can be classified as either passive systems or active systems. Passive systems require no user intervention to prepare for a flood event. Active systems require advance notice of a flood event to permit the user to intervene and deploy the flood protection system. Active systems may be divided further into perimeter barriers or opening barriers. Perimeter barriers are deployed at a distance from the protected building envelope and must provide continuity of protection around the entirety of the perimeter. Opening barriers are intended to protect individual openings along the exterior of the building façade, and are typically anchored to the building façade.

Examples of passive and active flood protection systems that have been identified as feasible for the International Inn include flood glazing systems, temporary barriers for door openings, and temporary perimeter barriers. The selection of protection types is an involved process that requires an evaluation of the value of mitigated losses and potential flood insurance premium reductions measured against the material and installation costs. Availability of storage space for active systems, deployment times, and ease of deployment are also critical considerations to assure that systems are properly installed in advance of a flood event. Architectural impacts must also be considered as part of strategy selection.

Figure 2. A flood glazing system is undergoing shop testing. The glass has been intentionally damaged to simulate potential wind-driven impacts coinciding with flood events.[3] This system may be a viable alternative for the historic atrium.

[3]https://www.fenex.com/flood-windows-and-walls

Figure 3. A temporary perimeter barrier installed at Vizcaya Museum & Gardens. The system shown is a bladder-style system which is filled with water and anchored to the ground as part of the deployment.[4]

Figure 4. A temporary opening barrier deployed in front of a doorway.[5] Permanent components for anchoring the barrier to the building must be installed.

[4]https://vizcaya.org/posts/vizcayas-new-flood-mitigation-system-featured-in-local-news/
[5]https://www.psfloodbarriers.com/product/ezdam-flood-barriers/

In addition to flood protection solutions, selection of flood-resistant building materials can mitigate the damage caused by a flood event. This may include the utilization of flood-resistant flooring and wall treatments, and elevating mechanical and electrical equipment and components above the design flood elevation, where possible.

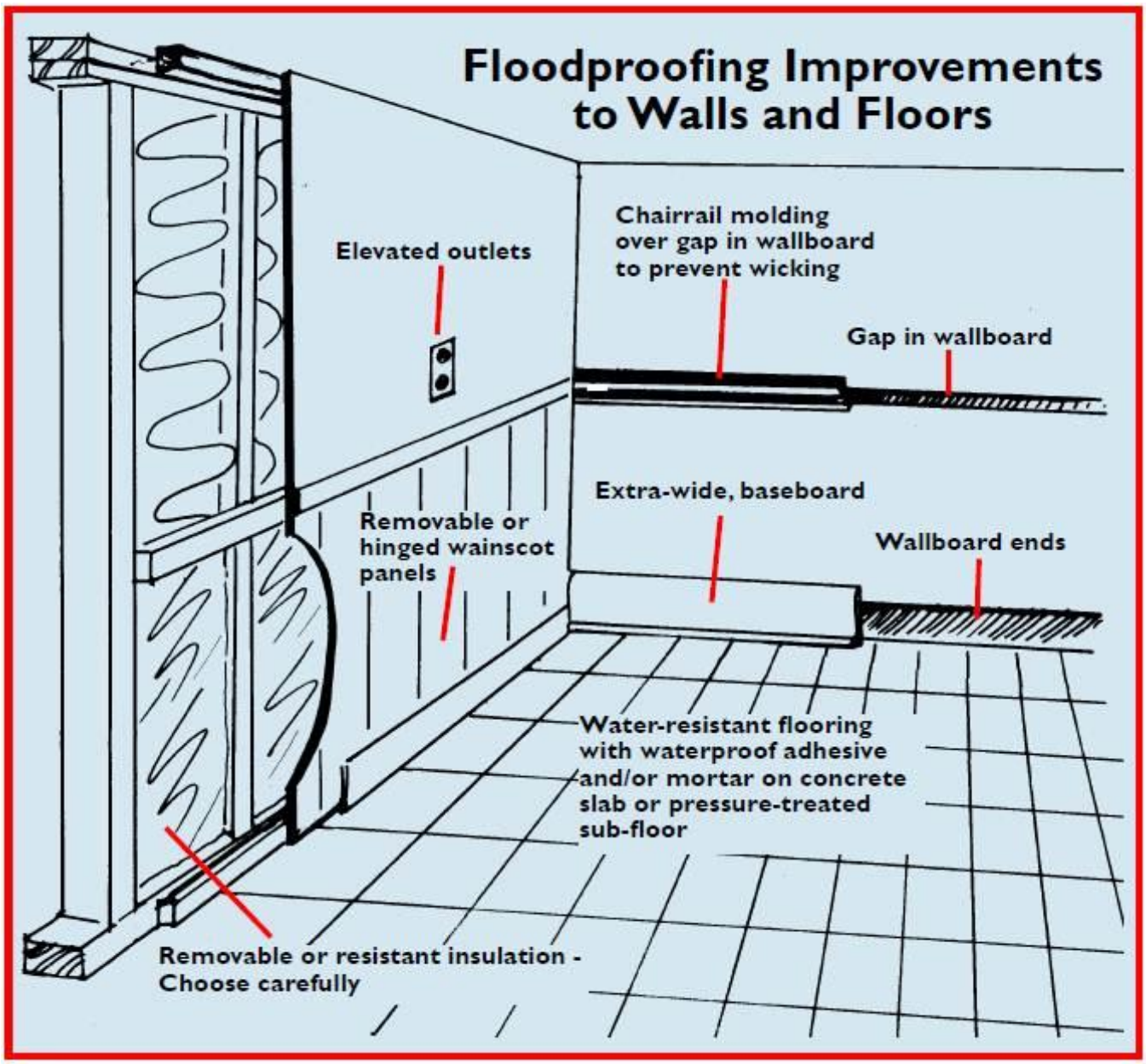

Figure 5. Floodproofing Improvement Examples.[6]

[6]https://www.lsuagcenter.com/topics/family_home/home/design_construction/design/remodeling%20renovation/preventing%20flood%20damage/floodproofing-improvements-for-walls-and-floors

Project Areas

For the purposes of this report, the property is described as having three areas:

1. The atrium building. The ground level of this building is primarily comprised of the lobby lounge, front desk, elevators, bathrooms, café, kitchen, and back of house.
2. Central suites. The ground level of this building is primarily comprised of a flex room and 13 suites.
3. North suites. The ground level of this building is primarily comprised of laundry utilities, storage, and 20 suites.

All areas have been identified to have a finished floor elevation of 4.00 feet NAVD.

The rooms at the central and north suites are each serviced by their own wall A/C unit which penetrates the exterior wall of the building structure. On the ground level, these units are located approximately 12 to 18 inches above the finished grade. Due to the volume of openings around the exterior of each building, perimeter barriers should be explored to reduce deployment time and minimize the number of mechanical connections needed to fully secure the structures. Perimeter barriers will also permit a higher level of flood protection, as the penetrations for the A/C units on the ground level cannot be sealed.

If perimeter barriers are not feasible, opening barriers below the level of the A/C wall penetrations should be explored to protect against minor to moderate events. Finishing the interiors within the buildings utilizing flood-resistant building materials beneath the design flood elevation will also mitigate potential damage.

The atrium building is comprised primarily of glass storefronts with access doors around its perimeter. A flood glazing storefront may be the most appropriate solution due to limited setbacks from the adjacent property to the south. Temporary door barriers may be utilized in conjunction with flood glazing to seal any remaining openings.

Figure 6. North suites facing the waterfront with A/C units along exterior wall.

Figure 7. The northeastern side of central suites with low A/C units at each ground level room.

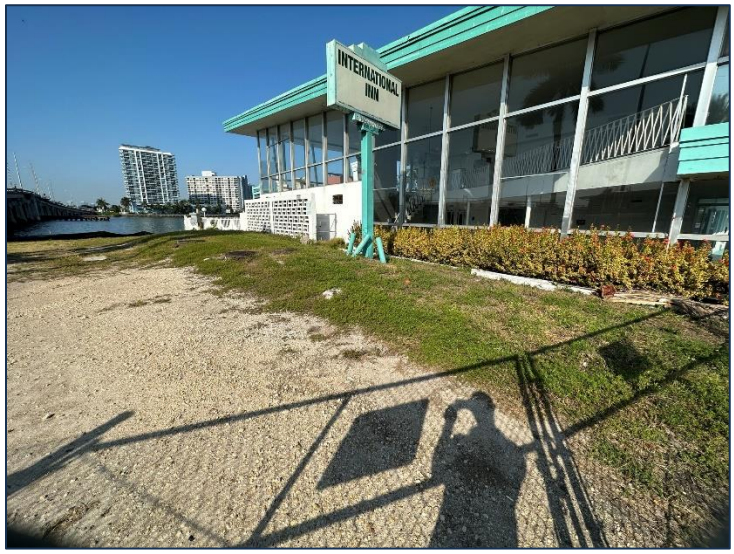

Figure 8. The north side of the atrium building has a minimal setback from the adjacent property, and the space must be used for back of house operations.

Figure 9. Side entry to atrium building from concourse along central suites.

Figure 10. Entryway to atrium building from pool deck where atrium building connects to central suites.

Conclusion

While many flood mitigation strategies and products exist, the available options are limited due to a large building footprint, small site setbacks, existing building construction, and historic preservation requirements. As an historic property, the building structures are generally exempt from the flood protection requirements under City Code so long as they maintain their historic designation.

However, due to the low elevation and direct exposure to Biscayne Bay, the site is at an elevated risk of storm surge flooding. To determine the most appropriate flood mitigation strategy for the project, benefits and costs should be evaluated, along with operational requirements and constraints.