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ZERO's Flood Barrier Shield Can Contribute to Floodproofing Design Under National Flood Insurance Program Regulations

Zero International's Flood Barrier Shield is an easily installed, watertight barrier for doors (model #2070) and windows (model #2080) that helps safeguard building contents from a foot or more of floodwaters. When formally integrated into certified floodproofing design plans for eligible buildings in flood hazard zones, these versatile door and window barriers can be used to satisfy design performance standards issued under National Flood Insurance Program (NFIP) regulations for determining flood insurance eligibility and ratings. The NFIP standards are also adopted by communities through their floodplain management ordinances requiring floodproofing certification for issuance of building permits.

Certifying design professionals can refer to floodproofing guidance published by the Federal Emergency Management Agency (FEMA), which makes flood insurance available (through the Federal Insurance Administration) to residents of participating communities. FEMA Technical Bulletin 3-93 describes design, construction, planning and certification requirements for the floodproofing of non-residential buildings under NFIP regulations. Floodproofing is defined to mean making a building watertight, i.e., substantially impermeable to floodwaters. When properly designed and certified, floodproofing of non-residential buildings may be permitted as an alternative to elevating to or above 100-year flood levels (referred to as Base Flood Elevation—BFE) established for flood-prone areas.

(Eligible non-residential structures for NFIP floodproofing certification also include mixed-used buildings that are professionally designed with all residential uses located above the floodproofing design elevation. Floodproofing below the BFE in residential buildings for the most part is not permitted (i.e., does not provide insurance eligibility) under NFIP regulations. And in Coastal High Hazard Zones, construction or substantial improvement of buildings with lowest floor elevation below established flood levels is not allowed, regardless of any floodproofing techniques used. Notwithstanding NFIP ineligibility, however, it is important to note that the proven performance of Zero's Flood Barrier Shield, in accordance with NFIP standards discussed below, makes it a valuable resource as well for maximizing flood protection for residences in any flood-hazard area.)

Blocking water ingress at doors and windows

Installation of watertight closures for doors and windows is among examples of floodproofing features for eliminating or reducing flood-damage potential cited in the FEMA publication, "Floodproofing of Non-Residential Structures" and referenced in FEMA Bulletin 3-93. Zero's Flood Barrier Shield (FBS) is engineered to provide a qualifying watertight barrier that protects and prevents

water ingress through doors and windows. When water accumulates from any source, including heavy rain overflows and rising groundwater, this barrier will effectively block a foot or more of floodwaters. FBS is ideal for buildings with adjacent wetlands or in high-rainfall regions.

FBS comes in lightweight aluminum panels of any height specified at time of order. When needed, the door model is installed into pre-mounted vertical channels attached to door frames or adjacent walls. There is an additional horizontal channel across frame bottoms for installation of the window model. Installation is easy with no tools required for inserting the shield sections. A maximum height of three feet for the base section will ensure fastest installation by one person working alone, and additional panels can be stacked if greater total height is needed. As noted in FEMA Bulletin 3-93, the ease of installation for removable devices such as FBS is factored into determining appropriate floodproofing design elements based on rate-of-rise for floodwaters at the site, the flood warning time available, and other considerations.

Both the shield sections and mounting channels of FBS are constructed of marine-grade aluminum. Attached to the channel brackets and bottom of each shield section, Zero's proprietary closed cell sponge neoprene rubber is the key to FBS's impermeability. The rubber compensates for any gaps at door thresholds along with solidly sealing all frame edges. As floodwaters rise, increasing hydrostatic pressure against the Flood Barrier Shield amplifies the sealing effect.

Because FBS is a life safety product, Zero recommends inspecting and replacing the rubber (part # 2070N) on the Flood Barrier Shield at least annually to ensure maximum sealing strength and impermeability when needed. This inspection and replacement schedule should be incorporated into the Inspection and Maintenance Plan required for all floodproofed buildings. The specific requirement called out in the FEMA bulletin for flood shields and closures is inspection and maintenance as needed to ensure that they fit properly, and that gaskets and seals are in working order, properly labeled, and stored as indicated in the Flood Emergency Plan.

It is important to note that NFIP regulations require floodproofing to an elevation at least one foot above the Base Flood Level in order for buildings to receive insurance ratings based on 100-year flood protection. Certifying designers can incorporate Flood Barrier Shield into floodproofing designs that exceed this requirement, thereby qualifying for lower insurance premiums under the regulations.

Zero's design engineers are available to consult with floodproofing designers about optimizing the use and performance of Flood Barrier Shield in their floodproofing plans. We also invite homeowners to contact us for guidance about using Flood Barrier Shield to protect household contents from rising waters.

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References:

“Non-Residential Floodproofing – Requirements and Certification for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program,” FEMA Technical Bulletin 3-93 (Federal Emergency Management Agency FIA-TB-3 4/93)

<http://www.fema.gov/pdf/fima/job6.pdf>

“Floodproofing for Non-Residential Structures,” FEMA Publication # 102

<http://www.fema.gov/library/viewRecord.do?id=3581>

Flood Insurance Floodproofing Certificate (FEMA Form 81-65, FEMA Publication F-056, 2/06)

<http://www.fema.gov/library/viewRecord.do?id=1600>

“Engineering Principles and Practices of Retrofitting Floodprone [Residential] Structures,” (FEMA Publication 259, 6/01)

<http://www.fema.gov/library/viewRecord.do?id=1645>