

Chapter 7

Closure of Openings

Section 700.0 Scope

Sec. 700.1 General: Openings in exterior and interior walls of buildings or structures in a Special Flood Hazard Area which are wholly or in part below the RFD shall be provided with waterproof closures meeting the requirements of this chapter.

Section 701.0 Types of Closures

Sec. 701.1 Classification: Closures shall be classified into five types according to their compatibility with the waterproofing standards of the various flood proofing classes.

Sec. 701.1.1 Type 1 Closures - shall form a complete sealed barrier over the opening that is impermeable to the passage of water at the full hydrostatic pressure of a flood to the RFD.

Sec. 701.1.2 Type 2 Closures - shall form essentially dry barriers or seals, allowing only slight seepage during the hydrostatic pressure conditions of flooding to the RFD.

Sec. 701.1.3 Type 3 Closures - shall form barriers or seals that are impermeable to the passage of waterborne contamination under equalized pressure conditions.

Sec. 701.1.4 Type 4 Closures - shall form barriers to the passage of flood carried debris and the loss of floating items from the interior, but are not required to form impermeable seals.

Sec. 701.1.5 Type 5 Closures - are those of existing spaces which do not meet the requirements of any of the above described types, but are in use as required by "The Building Code."

Section 702.0 Requirements

Sec. 702.1 Design Standards for Closure Assemblies: The structural capacity of all closures shall be adequate to support all flood loads acting upon its surface. Closure assemblies may be fabricated of cast iron, steel, aluminum, or other adequate and durable structural material, provided with a continuous support around its perimeter, and shall be attached to the building or structure at its immediate location of use i.e.; hinged, on slides, or in a vertical recess. The closure device shall be capable of being set in place with minimal manual effort. Seals, where required, shall be gasketed pressure types permanently anchored or attached to the structure or to the closure assembly. Closures designed to lift into vertical recesses for storage when not in use, and/or located so that the open position of the assembly will not impede fire exit or the functioning of fire closure assembly, shall be supported in the open position by auxiliary supports or safety latches that can be released at times of flooding. In the closed position, the closure assembly shall engage fixed wedging blocks that will force the closure into a tight sealing position. The entire closure assembly should be inspected by the owner annually and suitably maintained to preserve its waterproof and structural quality or be replaced as required.

Sec. 702.2 Frames for Openings: Each opening below the RFD shall have a metal frame suitable for providing an adequate sealing surface and for supporting the flood proofing closure assembly. The frame shall be connected to the adjacent walls and floors and provide adequate bearing surface and anchorage to transfer the panel loading into the wall. It shall be supported upon adjacent floor or wall intersections or sufficient reinforcement shall be provided around the opening in the concrete or masonry wall to transfer the panel load to such intersections as required.

Sec. 702.3 Openings in Shafts: All buildings or structures which have enclosing walls, decks, or shafts with horizontal or inclined openings at the top that are at or below the RFD and which would inundate W1 or W2 spaces shall be provided with Type 1 closure assemblies that can be readily positioned and secured to prevent

entrance of floodwaters. Construction of such openings shall provide for permanently affixed doors, wall extensions, gates, panels, etc., that are either hinged or on slide tracks to facilitate prompt and positive sealing of the opening with only minimal manual effort. Windows, grilles, vents, door openings, etc. in the side walls of a shaft and below the RFD shall be provided with flood proofing closures meeting the requirements of 701.0.

Sec. 702.4 Fire Resistivity of Closure Assemblies: All flood proofing closure assemblies shall have a fire resistive rating that conforms to the requirements of "The Building Code" and the particular fire protection requirements for the occupancy group and building type of the structure.

Section 703.0 Special Applications of Closure Assemblies

Sec. 703.1 Applicability: Residences, firms, businesses, or institutions with fewer than 10 permanent employees; or spaces which are or would be unoccupied and unattended in their foreseeable normal operation for periods of greater than 72 hours shall not have any window, doorway, or other such opening any part of which is below the RFD unless at least one of the following conditions is met:

- (1) Type 1 and 2 closures are utilized and are fully automatic types.
- (2) Manually installed closure devices meeting the requirements of the appropriate flood proofing class are provided and are installed in their protective position by the Owner at any time in the season of high flood danger during which the space will be unoccupied and unattended for periods of longer than eight hours. This requirement shall be considered in the Owner's Contingency Plan and noted by the Building Official on the permit and Certificate of Occupancy.
- (3) Watertight exterior walls, dikes, levees or floodwalls of adequate design (as specified in Chapter 6) are constructed to prevent floodwaters up to the RFD from entering the structure or space.