

# Study On Flood barrier for building

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**ABSTRACT:** Floods barrier for building is a specific type of floodgate, designed to prevent a storm surge or spring tide from flooding the protected area behind the barrier. A surge barrier is almost always part of a larger flood protection system consisting of floodwalls, levees (also known as dikes), and other construction and natural geographical features. Flood barrier may also refer to barrier placed around or at individual buildings to keep floodwater from entering that building.

**KEYWORDS:** flood; barriers

## I. INTRODUCTION

Floods barrier for building is a specific type of floodgate, designed to prevent a storm surge or spring tide from flooding the protected area behind the barrier. A surge barrier is almost always part of a larger flood protection system consisting of floodwalls, levees (also known as dikes), and other construction and natural geographical features. Flood barrier may also refer to barrier placed around or at individual buildings to keep floodwater from entering that building. The self-closing flood barrier has been in use globally since 1998. Its design uses the approaching floodwater to automatically raise the barrier. The automatic operation, along with its minimal footprint with no need for steps or ramps makes this type of defense ideal for unmanned sites, for where aesthetic considerations mean that a permanent barrier is not acceptable, or where there would be insufficient warning and manpower to use manually installed barriers. Flood barriers are used to reduce or prevent the detrimental effects of flood water.

## II. CAUSES OF FLOOD

Floods are caused by many factors or a combination of any of these generally prolonged heavy rainfall (locally concentrated or throughout a catchment area), highly accelerated snowmelt, severe winds over water, unusual high tides, tsunamis, or failure of dams, levees, retention ponds, or other structures that retained the water. Flooding can be exacerbated by increased amounts of impervious surface or by other natural hazards such as wildfires, which reduce the supply of vegetation that can absorb rainfall. Periodic floods occur on many rivers, forming a surrounding region known as the flood plain. During times of rain, some of the water is retained in ponds or soil, some is absorbed by grass and vegetation, some evaporates, and the rest travels over the land as surface runoff. Floods occur when ponds, lakes, riverbeds, soil, and vegetation cannot absorb all the water. Water then runs off the land in quantities that cannot be carried within stream channels or retained in natural ponds, lakes, and man-made reservoirs. About 30 percent of all precipitation becomes runoff and that amount might be increased by water from melting snow. River flooding is often caused by heavy rain, sometimes increased by melting snow. A flood that rises rapidly, with little or no warning, is called a flash flood. Flash floods usually result from intense rainfall over a relatively small area, or if the area was already saturated from previous precipitation.

## III. FLOOD BARRIER FOR BUILDING

The flood barrier for buildings is a modular system designed to withstand high velocity water loads and to be highly resistant to heavy impact forces. It is particularly applicable to flash flood and hurricane prone location in both small and large installations. It has a long and proven history as an effective flood barrier in all flood-prone areas of the world, being one of the system preferred by most of the larger insurance companies and governments. The system itself can be installed either across specific openings or as a perimeter defense. The system comprises of 'C' shaped support

post and hollow Aluminum beams, the ends of which mount (slide) down between the jaws of each post. These beams stack on edge with each other with a tongue and groove connections. .

Flood barriers may also refer to barriers placed around or at individual buildings to keep floodwaters from entering that building.

- Delta Works

The Delta Works in the Netherlands is the largest flood protection project in the world. This project consists of number of surge barriers, it is largest barrier in the world. 9 km long, other Examples include the MAESLANTKERING, HARINGVLIENTDAM, and the HARTELKING

- Thames Barrier

The Thames Barrier is the World's second largest movable flood barrier and is located downstream of central London. Its purpose is to prevent London from being flooded by exceptionally high tides and storm surges moving up from the North Sea. It needs to be raised only during high tide; at ebb tide it can be lowered to release the water that backs up behind it.

- New Orleans

In 2007 United State Army Corps of Engineers started construction of an ambitious project that aimed to prevent storm surges from flooding the city by 2011. The IHNC Lake Borgne surge Barriers on the confluence of these waterways is the largest in the United States.

- Eider Barrage

The Eider barrage is located at the mouth of the river Eider near Toning on Germany. Its main purpose is protection from storm surges by the North SEAS. Its Germany's largest coastal protection structure.

- River Foss Barrier

The River Foss, York, UK has a barrier to control the inflow of fast moving water from the River that may overspill its banks upstream the Foss and flood surroundings properties.

#### IV. TYPES OF FLOOD BARRIER FOR BUILDING

##### Removable Flood Barrier

Our removable flood barriers (or 'demountable') are engineered to provide similar levels of protection to permanent flood defenses, but with the advantage of being fully removable when not required. They can be supplied for virtually any configuration including arcs, closed rectangles or circles and straight runs of any length. The portable flood barrier design can be used on slopes up to 20° and can be stepped for steeper gradients. This makes our demountable flood barriers ideal for building openings or as a continuous flood wall. Each system is load calculated based on application and the prevailing flood conditions and can be configured for flood protection heights up to 4m. Single spans up to 3m are possible. A four-sided detail is available for openings that may become fully submerged. To facilitate installation in new builds, we can supply pre-formed ground plates with integral anchors for the demountable supports. Alternatively, drill and fix anchor sockets can be provided for unobtrusive fixing through finished paving.

##### Glass Floodwalls

Flood Control International has developed the ultimate glass wall flood defenses that are capable of withstanding virtually any flood condition. See the new Hard Body Drop Test video below. The glass walls require no operational input and cause minimal visual intrusion where flood protection is required. Each glass barrier utilizes a combination of specially designed high strength structural glass, engineered frames designed to withstand the static and impact loads of the specific location, structural anchoring system, and specially designed watertight and impact resisting sealing technology. Flood protection heights up to 1.8m as standard. The result is a virtually clear glass barrier with no loss of visual amenity that can be used as a direct first line flood defense without the need for sacrificial panels, additional deflection devices or external buffers. Self cleaning glass and grade 316 stainless steel frames allow this system to be used in aggressive marine environments if required. Ideal when sea wall flood defenses are required. Our glass barriers can be used as individual viewing panels incorporated into hard flood defenses, or as a complete free standing glass wall spanning any length and following virtually any contour. There is also a version of the system that

can be retrospectively mounted onto suitable existing foundations. Tamper proof and concealed fixings are used throughout the system to reduce the possibility of vandalism. Safety factors are incorporated into all load calculations and material design to avoid the possibility of catastrophic system failure.

#### Flip- Up Flood Barriers

To provide unrestricted access to pedestrian and vehicle entrances, the automatic barrier is fully recessed in to the ground when not in use. Activated by a push button, automatically triggered by sensors, or manually, this flood barrier rises up to flood defense heights of 2m as standard and up to lengths of 12m.

#### Drop-Down Flood Barriers

When not in use the drop-down flood barrier is unobtrusively located above the head of the opening, ready to be lowered at a moment's notice. Automatic sensors can operate the barrier with rising floodwaters, or push button operation keeping you in control, with manual override make this an efficient dependable flood defense.

#### Self-Closing Flood Barriers For Buildings

These innovative flood barriers use the hydrostatic pressure of the rising flood water to activate and raise the barrier into position. No external power or intervention is required, making them ideal for unmanned locations, especially alongside rivers.

##### Flood barriers; advantages

- Bespoke length – Buffalo Flood Barriers offer flexibility because they can be designed and manufactured to any length. The flood barrier can be installed on a single door or joined together to create a flood wall or used to create a bund/compound around a key asset. This flexibility allows for solutions to be tailored to your requirements and makes flood barriers a popular solution for commercial and residential buildings. This also means your barrier is always manufactured bespoke to your property.
- Multiple height options – the Buffalo Flood Barrier can be manufactured in 200mm or 400mm increments height up to a height of 2000mm, making it applicable to a wide range of flood risks.
- Demountable – the Buffalo Flood Barrier can be erected only when a flood risk is imminent. The barrier system takes minutes to deploy, therefore it is suitable for garages or loading bays where vehicles are crossing each day.
- Bund/Compound – the flood barrier can also be used to create a compound around a key asset or building, which can be erected on a semi-permanent basis. Flood gates can be built into a flood wall or compound to offer pedestrian access, reducing the need to disengage the flood wall.
- Simple but effective – flood barriers are a proven way to protect your business and home from flood risks.

##### Flood barriers; disadvantages

- Human intervention – flood barriers do not offer passive protection, and instead require a humans to deploy the system. This can lead to errors and requires people to present when a flood risk is imminent.
- Storage – as flood barriers are unlikely to be deployed all the time, particularly if vehicle access is required on a daily basis, the barriers must be stored somewhere. This requires space for storage and training to ensure employees know where the flood barriers are in a flood risk event.
- Ground conditions – the ground conditions need to offer a flush threshold for the flood barrier to seal against, therefore the ground conditions needs to be considered prior to installation. This is a factor that is highlighted in a flood survey, and can be rectified by installing a metal floor plate when installing the flood barriers.
- The automatic flood control measures is a unique and effective method to control extreme flood water level. the automatic flood control is working without any man power or any other energy .

The automatic flood control measure is carefully designed as the self-rising of flood gate as per the flood water level increase. The design uses the approaching flood water to automatically raise the barrier. The automatic operation, along with its minimal footprint with no need for step or ramps makes this type of defense ideal for unmanned site for where

aesthetic consideration mean that a permanent barrier is not acceptable, or where there would be insufficient warning and man power to use manually installed barriers.

- It is not energy driven and operates without any human intervention and gives 24/7 a full protection. Because of the short closing time the barrier will only come up when there is a flood situation. No unnecessary falls deployments needed. So the area remains accessible until the last moment
  - When a storm or heavy flood occurs the water level increases
  - If water level increases, the water enters into efficient water storage space through the inlet valve.
  - The increasing water level in the outer area and pressure in the inlet valve also increases
  - This causes the height of water in the efficient storage space to increase.
  - When the water level touches the peak of storage space water enters into flood gate inlet.
  - Water in the flood gate inlet makes a pressure on the bottom of flood gate. That pressure raises flood gate up to the desired level.
  - The floodgate limit stopper locks base of the floodgate without leaking water
  - When water level decreases in the outer area, pressure in the inlet valve decreases. Then flood gate will descend downwards.
  - Water then passes through the inlet and results in the opening of one way valve
  - The barrier usually resides below ground in a vertical position within a steel or concrete trough. The barrier consists of a rigid foam core and a GRP outer layer.
- parameter and materials are following ;
- Automatic flood barrier is made under the ground so there will be a need of retaining wall which is constructed by M20 concrete for the efficient storage space
  - And the flood gate inlet are made by using the pvc pipes and they are fixed or placed along the longitudinal direction.
  - The floodgate limit stopper is made with metal which is of steel.
  - Floodgate is with steel with which has a rubber band on top and bottom of the floodgate.

Conclusion:

There are several limitations for the existing type of flood barriers. So we can conclude that there is a need of a new system on flood barrier. So we are implementing an automatic flood barrier which is more efficient and advanced than the existing type of flood barrier around us. And from the above project presentation we can understand that the working of automatic flood barriers is more effective and economical and no man power or any other power generation is not required for the automatic flood control barrier so it will help us by providing safe to our belongings at the time of flood

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