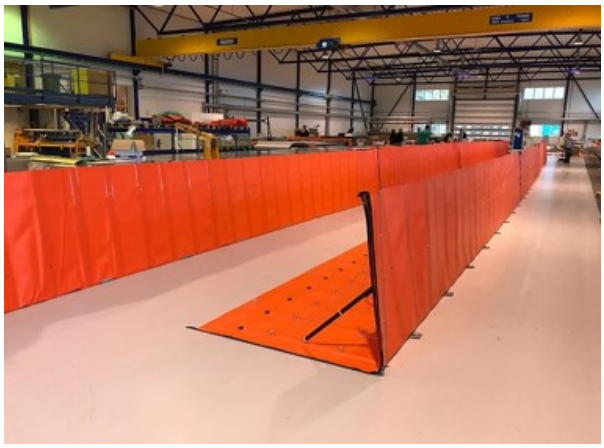
Perimeter Flood Barrier – Roll-Outs

Perimeter flood barriers (cantilever walls) are freestanding, lightweight barriers that can be quickly deployed in the event of an emergency. The barrier can be set up and positioned by just one or two people and offers protection for commercial and emergency environment applications. After the emergency is over, it can be packed up and stored until is needed again. A variety of cantilever wall systems are available from manufacturers, but the common characteristic of cantilever wall barriers is that they rely on the hydrostatic flood load to develop the friction force necessary to resist the lateral flood load. There are various configurations of cantilever wall barrier system, but similarities typically include a lightweight, planar vertical element to retain the floodwater, lateral struts to resist the hydrostatic flood load, and an at-grade element to receive the lateral struts. The systems may or may not require anchorage points at the ends of the barrier and generally require a flat, level surface for installation. In addition, some systems require ground anchorage to resist wind loads should flood water not be present.



Relation to Adaptation and Resiliency

Helps achieve protection of structures/facilities in the event of floods or natural disasters at the ground level.

Benefits

Cantilever walls can be disassembled and easily stored when not in use.

Limiting Factors (Constraints)

- Flood water depths for these systems varies widely, but most systems don't retain more than 6-feet of flood water. This limitation has more to do practical installation, handling, and storage requirements than technical limitations of the system.
- Cantilever wall systems may or may not be stored at the point of use. Therefore, consideration should be given to storage and a means to transport the units to where they are needed.
- Ground condition requirements vary per system. Preferred location is a paved surface, such as a street, sidewalk, or parking lot, though some systems can be installed on non-paved surfaces. The systems can accommodate some grade change along the length of the wall, but because the lateral resistance of the wall is generated by friction and the geometry of the barrier, close attention should be paid to the slope of the ground perpendicular to the long axis of the wall. At ground discontinuities, such as curbs, an impervious transition surface needs to be constructed below the entire width of the barrier.

Design & Preliminary Costs

Cantilever walls are typically designed by the manufacturer and installation needs to be in accordance with manufacturer's recommendation. Care should be taken to understand the limitations of each system. Cantilever walls are typically a proprietary system and it is recommended that product installation requirements and recommendations are reviewed and understood prior to purchasing.

Cantilever walls rely on the weight of the flood water to generate the friction force necessary to resist the lateral hydrostatic forces. For these systems to function properly it is imperative that the flood water is unable to seep below the water weighted element of the barrier wall.

Purchase costs are on the order of $50/lineal foot (LF) to $100/LF for walls between 24" tall and 48" tall respectively (Source: Cost data for systems like the NOAQ Boxwall and come from Flood Defense Group). Additional costs to consider are storage, deployment transport, installation and removal, and monitoring and maintenance during deployment.

Permits & Approvals

No known special permits/approvals.

Implementation

Some barrier systems have unique installation requirements such as anchorage at the ends of the walls, or special corner units at bends in the wall. Therefore, installation location of cantilever walls should be preplanned with geometry requirements considered. In addition, the existing surface to receive the barrier should be evaluated to ensure it is compatible with the barrier system. Installation rates of 100-linear feet per hour with a group of four trained people are possible.

Maintenance Requirements

- The barriers should be stored in a dry location per manufacturer's recommendations. Due to the variety of manufacturers, products, and materials used for fabrication, storage requirements are likely to vary.
- Once deployed, the barriers should be maintained, through inspection, on a regular basis.
- Staff should be trained on a yearly basis.

Useful Life

Useful life should consider both shelf-life (undeployed) and service life (deployed). A shelf-life of 25 years or more should be achievable depending on the barrier materials and the environmental conditions of the storage. Deployed service life is highly dependent on conditions of deployment and loads such as debris, wind, and waves. In general, deployed service life should be limited to a few months with regular inspection for wear and tear. Multiple deployments of the walls are feasible, but the wall components should be carefully inspected after each installation.

References/Specifications

- NOAQ Gablewall by MBZ Industrial, Inc. Fact sheet
- NOAQ Boxwall by MBZ Industrial, Inc.
  https://www.floodsax.us.com/collections/noaq/products/noaq-box-wall
- FloodWall by AquaFence
  https://www.aquafence.com/floodwall
- Integrated Floodshield by AquaFence
  https://www.aquafence.com/ifs
- Rapidam by Aquobex
- Geodesign Barriers by Hydro Response Ltd.