

Mobile Flood Barriers

Some advice ahead of purchasing and procurement

The mobile flood barrier is a relatively new concept. Mobile flood barriers are temporary barriers built from components that are transported to the location in need of protection. Previously, the sandbag was, in principle, the only structural method of building temporary flood barriers. However, during recent years, several new products have been launched.

Varying flooding scenarios and differing local conditions mean that different technical solutions may be required. Thus, it may not always be possible to say that one particular product is better than another. Which ones should we choose then, and which requirements are relevant to procurement? Here is some advice.

Retainment height

What water levels will the barrier need to retain? Of course, high barriers provide an extra safety margin if it is not known how high the water will rise. However, at the same time, high barriers are more expensive than lower ones, and take longer to set up. Greater retainment heights also mean that the user will be assuming greater responsibility for those behind the barrier, if something were to happen. Higher barriers are also wider. And since all mobile flood barriers require a free strip of land, there may be sections where a higher barrier simply won't fit. When it comes to the width of the barrier, there are also considerable differences between the products available on the market.

Proposed requirements:

The barrier must cope with retaining at least X cm of water.

The width of the barrier must not exceed Y cm.

Safety in the event of overtopping

Several flood barriers are designed in such a way that they will remain standing even when the water rises all the way to the top, and starts running over. In this case, they continue to be useful because they limit the inflow of water into the protected area. However, there are also products that cannot manage this; i.e. barriers that run the risk of tipping over or sliding away when a certain critical level is exceeded. It is important for a barrier to remain standing in the event of overtopping since one that suddenly collapses when levels are rising poses an obvious risk to those behind it.

Proposed requirement:

The barrier must be able to remain standing and to function normally even when the water reaches the top.

Weight

The heavier a barrier is, the more time and energy will be needed to build it, and the more slowly things will go. A heavier barrier also entails more pressure being exerted on the ground, which can lead to the barrier sinking into the ground, especially when the water piles on the pressure. During flooding, the ground is often waterlogged and has a poorer capacity to support. The weight exerted can be expressed in kg/linear metre. It will also be good if the included components are light enough to be carried and handled manually

Proposed requirements:

The maximum weight of a barrier must not exceed X kg/linear metre.

It must be possible to handle all components manually.

Curves and corners

Mobile flood barriers often need to be positioned in a zigzag pattern past obstacles of different kinds, e.g. trees, poles, and the corners of houses. It is thus important that barriers can be positioned in curves, and that it is also possible to create angles where necessary. Different products have different solutions, and it is difficult to make general demands regarding how these must look. One possibility is to set requirements regarding the radii of curves instead.

Proposed requirement:

It must be possible to swivel/angle barriers using a maximum curve radius of X metres, both towards the flooding and away from it.

Storage and transportation

The components of the barrier are normally delivered on pallets or in boxes. These can in turn be loaded into containers. To avoid products becoming very bulky, you can set requirements regarding how many linear metres of barrier will be housed within a container, or on a trailer, or in some other space other space that has well-defined measurements.

Proposed requirements:

All materials for X linear metres of barrier must fit into a 20-foot ISO container.

All materials for X linear metres of barrier must fit onto a trailer whose maximum dimensions are Y x Z metres.

Handling and staff requirements

Some products may need special equipment for both transportation and handling, as well as specially-trained staff for assembling them. One possibility is to request specification of the minimum number of staff needed to put the barrier in place, whether these need to have special competence of some kind, and what equipment is needed.

Or you set a requirement:

Proposed requirements:

Transportation of the materials must be possible on a trailer towed by a car.

Handling and assembly must be possible using a maximum workforce of X people without any special kind of competence, using the product instructions as their sole source of information.

Anchoring

Mobile flood barriers can be divided up into three different categories on the basis of how they are anchored. Some barriers are stable because of their own weight, others are mechanically anchored to the ground or to external anchor points, and there is a third category of barrier that is self-anchoring. The latter is designed in such a way that it is anchored entirely by the weight of the floodwater itself. For that matter, you do not need to establish how the mobile flood barrier is anchored, as long as you are ok about demanding that it has to be, and as long as you are clear about which demands the product in question makes of its users or the place where it is to be used.

Leakage

All mobile flood barriers leak to some degree. However, this leakage largely occurs underneath the barrier. Just how great this leakage is will depend more on the nature of the ground surface than on the design of the barrier. Incidentally, all barriers will be roughly just as watertight if you cover them with plastic sheeting. Thus, it is of no great interest to base things on the leakage measured on smooth concrete surfaces at testing plants. Furthermore, in practice, water also leaks through the ground itself, underneath the barrier. To this must be added water in the form of rainfall and from streams that are blocked by the flood barrier itself. This means that mobile flood barriers must always be supplemented with one or more pumps of sufficient capacity, in turn entailing that the barrier's own leakage will not pose a problem. Thus, during procurement, there is no reason to set any requirements regarding maximum permissible leakage.

Ice and driftwood

During flooding, ice floes, driftwood, and all manner of things can start to flow. For low bridges, a threat can be posed by something getting stuck, and a large pile of debris subsequently accumulating. However, in the case of mobile flood barriers, the risk is small. Objects carried along by the water continue in the direction of flow, along the flood barrier, and only rarely straight towards it. Thus, temporary flood barriers do not need to be dimensioned for any stresses and strains greater than the power of the water itself.

Materials

There are functioning mobile flood barriers made of widely differing materials (plastic, metal, canvas). Thus, from this perspective, there is no reason to set any requirements regarding what material the barrier must be made of. On the other hand, you can of course demand that barriers are not made of environmentally-dangerous materials (thus requiring you to define what you deem to be environmentally-dangerous). You may also envisage requiring the material to be recyclable when the product is scrapped at some point in the future.

Assembly speed

The assembly speed of a specific flood barrier is difficult to measure. This doesn't just depend on the design of the barrier, but also to a large extent on the efficiency of the workforce assembling it. The fact that the contractor's staff can assemble a barrier in a short period of time does not necessarily mean that an untrained user can do so too. Thus, it is not particularly meaningful to set any requirements regarding assembly speed.

SM 13/4/2017