



DOCUMENTATION SCFB

Self Closing Flood Barrier

Dutch design

All SCFB barriers are build en designed by Hyflo B.V. in The Netherlands.

Introduction

Why flood Protection

Extreme global flooding events are occurring with increasing frequency, affecting both the developed and the developing world with catastrophic results. A confluence of contributory factors, including but not limited to climate change, increasing global population and settlement in vulnerable areas, urbanization and deforestation, is having a profound effect on communities worldwide. Climate change in particular has resulted in an increased severity and intensity of rainfall. The human and economic impact of recent catastrophic flood events, such as in the UK, Germany, Australia, Pakistan, USA, Brazil and India is beyond measure, yet solutions, as the Self Closing Flood Barriers are available to mitigate the impact that flooding brings.



Self Closing Flood Barrier

The Self Closing Flood Barrier SCFB, is an unique effective flood defense system to protect people and property from inland waterway floods caused by heavy rainfall, gales or rapid melting snow. This system has been developed in the Netherlands to provide optimal protection against extreme high water levels. The barrier systems have proved to be the best flood protection and has already been built and installed in several countries around the globe. In operational use globally since 1998, the SCFB is acclaimed as the world's most effective flood protection system. Its success can be attributed to the simple, but ingenious concept of using the approaching floodwaters to automatically raise the barrier; effectively using the problem to create the solution. With an unblemished 100% track record the SCFB is a highly favorable preference when specifying optimal and cost effective but passive flood defense.



SCFD

Private property protection

The SCFD is a smaller version from the SCFB and is intended to protect small gates and private property against floods. The working principle is very similar to that of the larger SCFB but in a reduced scale. Because of this reduced scale and the lighter materials the barrier is easy to install and in most circumstances the SCFD does not require a service pit and can be fit with a standard pipe connection to the sewer. The basin from the SCFD is made out of very durable PE-HD material and reinforced with stainless steel. The wall is fabricated in one length and made from a honeycomb profile. Depending on the requested length and location Hyflo can advise what the best option is for the specific location.



SCFD aluminum top

A15– Access covers and gratings capable of withstanding a 15kN test load. For use in areas where only pedestrians have access.



SCFD stainless steel top

B125 – Access covers and gratings capable of withstanding a 125kN test load. For use in car parks and pedestrian areas where only occasional vehicular access is likely.

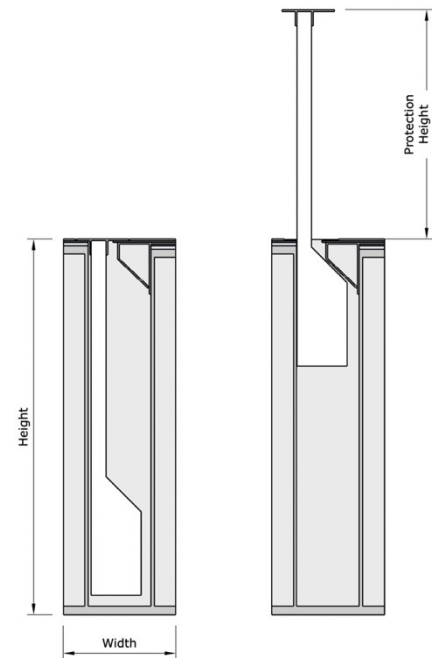


Dimensions

The SCFD can be built in length up to 4 meters and in heights till 600mm and 2 meter length till 900mm height. All SCFD will be build by Hyflo in house to suit the requested lengths and heights and com with an installation schedule for this dimensions.



Standard dimensions



| | Protection Height | Max length | Height | Width | Pipe connection |
|----------|-------------------|------------|----------|--------|-----------------|
| SCFD 300 | 300 mm | 4000 mm | 700 mm* | 270 mm | 110 mm |
| SCFD 600 | 600 mm | 4000 mm | 1000 mm* | 270 mm | 110 mm |
| SCFD 900 | 900 mm | 2000 mm | 1400 mm* | 300 mm | 160 mm |

SCFB Steel basin

Secondary flood protection

The steel basin is delivered complete with wall, supports blocks, lids, seals and guide rail and is therefor easy to install. The basin undergone a thermal spraying and a coating for a longer life time and for the sustainability of the product can also be build in stainless steel. Depending on the requested length and location Hyflo can advise what the best option is for the specific location.



SCFB steel Basin reinforced with concrete / concrete basin

C250 – Access covers and gratings capable of withstanding a 250kN test load. For use in car parks, forecourts, industrial sites and areas with



SCFB steel Basin reinforced with concrete in combination with Load transfer slab

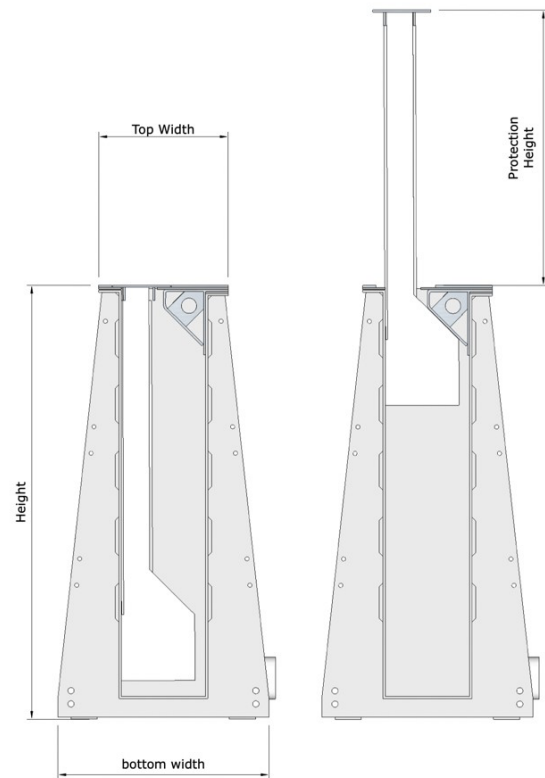
D400 – Access covers and gratings capable of withstanding a 400kN test load. For use in areas where cars and

lorries have access, including carriageways, hard shoulders and pedestrian areas.



Dimensions

The SCFB steel basin can be build up to 8 meter in length and sections to require any length. The standard protection heights for the SCFB are 500mm , 1000mm, 1250mm, 1500mm. All SCFB will be build for the requested lengths and heights and come with an installation schedule for this length.

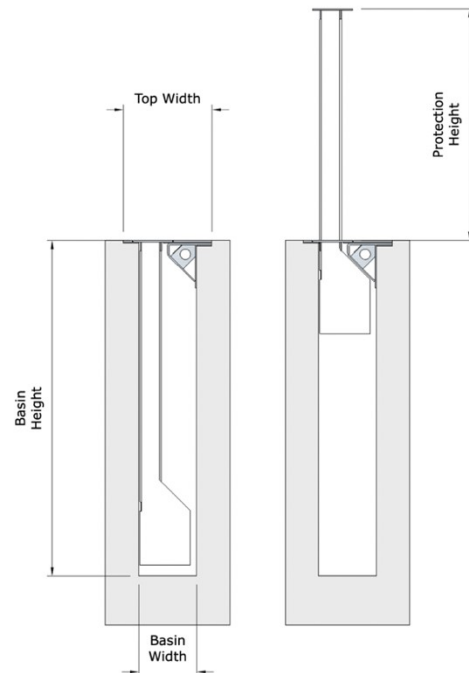


| | Protection Height | Max length | Height | Top width | Bottom Width | Pipe connection |
|-------------|-------------------|------------|---------|-----------|--------------|-----------------|
| SCFB 500 S | 500 mm | 8000 mm | 1065 mm | 490 mm | 700 mm | 160 mm |
| SCFB 1000 S | 1000 mm | 8000 mm | 1645 mm | 490 mm | 800 mm | 160 mm |
| SCFB 1250 S | 1250 mm | 8000 mm | 1945 mm | 490 mm | 850 mm | 160 mm |
| SCFB 1500 S | 1500 mm | 8000 mm | 2245 mm | 490 mm | 900 mm | 160 mm |

SCFB concrete

Primary flood protection

The SCFBä can be built at any required length. The basin from the SCFBä can be built in concrete, galvanized steel or stainless steel. Depending on the requested length and location Hyflo or its dealer can advise what the best option is for the specific location. The floating wall consists of a PUR foam core with a fiberglass or GRP outer layer. The walls are reinforced with composite profiles and textile fiberglass. The wall is fabricated in 1 m lengths (deduction of a notional tolerance) and connected together to form the overall length of the required barrier. The connections of the walls to each other are done by a reinforced rubber* strip and stainless-steel mounting strips. Because of the unique patented design of the SCFBä and the strength of the floating wall the barrier can be built in every required length.



SCFB Concrete basin with Load transfer slab

E600 – Access covers and gratings capable of withstanding a 600kN test load. For use in areas

where high wheel loads are imposed such as loading areas, docks or aircraft pavements.

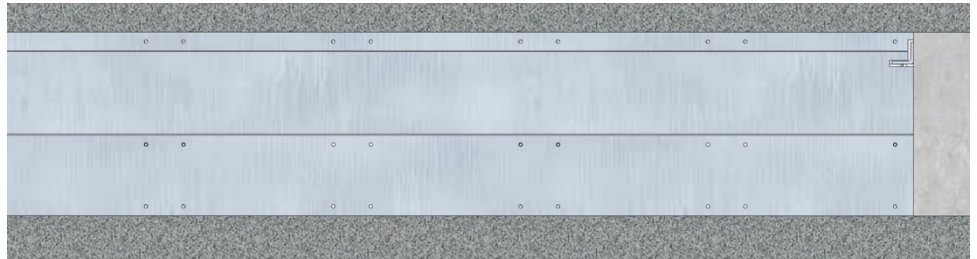
SCFB Concrete basin with reinforced top F900 – Access covers and gratings capable of withstanding a 900kN test load. For use in areas where particularly high wheel loads are imposed such as aircraft pavements.

| | Protection Height | Max length | Basin Height | Top width | Basin Width | Pipe connection |
|-------------|-------------------|------------|--------------|-----------|-------------|-----------------|
| SCFB 500 C | 500 mm | ----- | 1000 mm | 490 mm | 320 mm | 160 mm |
| SCFB 1000 C | 1000 mm | ----- | 1550 mm | 490 mm | 320 mm | 160 mm |
| SCFB 1250 C | 1250 mm | ----- | 1860 mm | 490 mm | 320 mm | 160 mm |
| SCFB 1500 C | 1500 mm | ----- | 2160 mm | 490 mm | 320 mm | 160 mm |
| SCFB 2000 C | 2000 mm | ----- | 2700 mm | 570 mm | 400 mm | 220 mm |
| SCFB 3000 C | 2500 mm | ----- | 3250 mm | 570 mm | 400 mm | 220 mm |

2. Top Finish

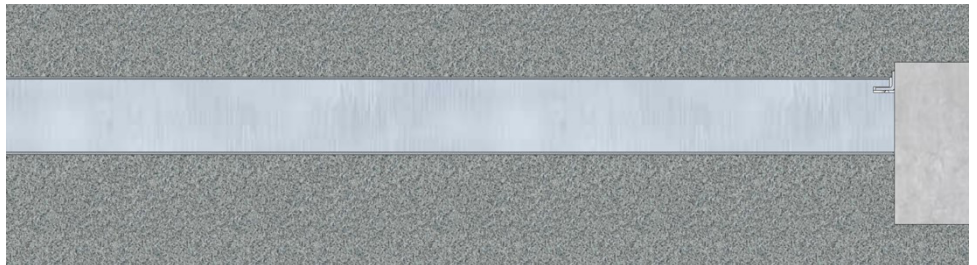
Standard top

Top plate, top strip and lid are visible



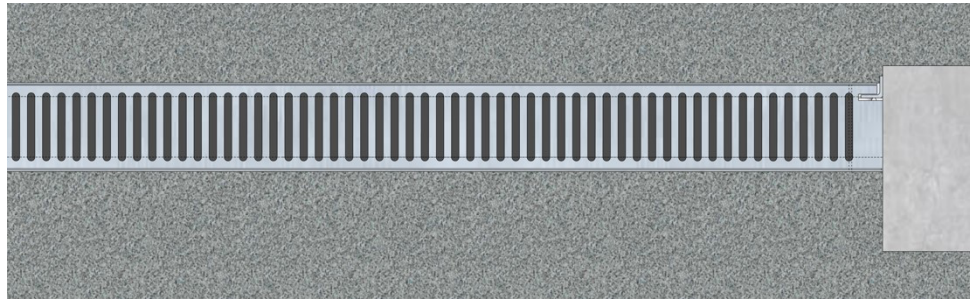
Extended top

With an extended top the top plate and top strip will have an elevation, The pavement can cover the top plate and strip. The lid is the only visible component of the barrier



Extended top as water runnel

The lid is replaced for a water inlet lid.



Invisible top

For the invisible top we use the extended top and lower the lid this create room to have the same pavement on top of the lid

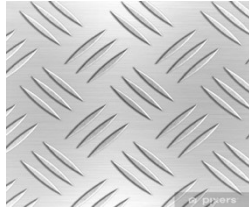


3. Top material

It is possible to choose between different top finishes.



Stainless steel



diamond plating



Corten steel



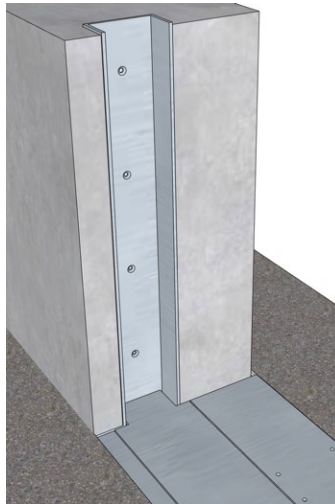
galvanized steel.

4. Guide

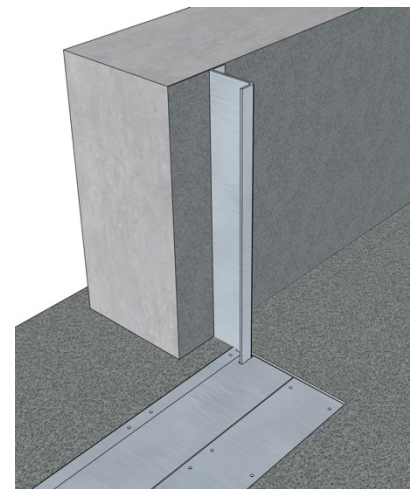
It is possible to choose between guide rails or guide slots as end protection of the SCFB. Guide rails are mounted at the outside of the fixed wall and guide slot can be mounted inside the fixed wall. A good operation of the SCFB relies on a guide rail or guide slot at each end of the barrier to seal against, The Guide also allows the barrier to be guided when rising and falling.



Guide rail



Guide slot



Guide rail front mounting

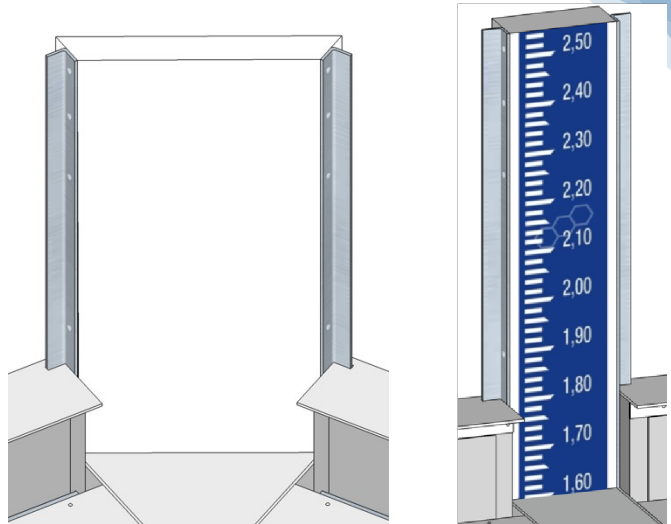
Where the barrier is fit between two fixed wall a guide rail can be mounted to the fixed wall. If a lot of traffic is passing the barrier it is recommended to use a guide slot that will seal the barrier inside the wall. If the SCFB is just in front of a building or wall a Guide rail for front mounting can be used to overcome the space between the wall and the barrier.

Guide post

When two lengths of SCFB units have to be connected to each other, or when the barrier has to make an angle, they must be connected with a guide rail. Connecting guide rails can be ordered in all different angles.

Where long lengths of barriers are installed, which cannot be accommodated in one length, guideposts are introduced to break the length up.

The SCFB sections are in standard lengths of 1m, which may be linked together. The use of guideposts can facilitate changes of direction or deviations from a straight line in the run of the barrier. The route of the barrier therefore needs to be defined and divided into suitable section lengths of up to 50 linear meters each.



5. Activation.

It is recommended for each SCFB unit to use a service pit to control the water inlet and drain. There are two types of Pits, a standard Pit and one with a pump. Which one is needed depends on the situation where the SCFB will be installed.

When the surface of the area water is normally lower than the bottom of the SCFB the standard Pit or pipe connection is sufficient to drain the SCFB system.

When the surface water is normally higher than the bottom of the SCFB a service pit with a pump is always required. The pump switches on automatically once there is water in the system and prevents the system to come up if there is no need for it.

Also in situations where water subsides slowly, the pump switch on once the flood is below flood level and the SCFB will no longer be an obstacle.

It is recommended to have a water supply in the area of the SCFB. It is required for commissioning, testing of the SCFB. The outlet of the pipe connection or service pit can be closed and the system can be easily filled by the water supply.

Hyflo will design and build the service pit to fit the barrier. The wish of the customer is taken into account so are number of inlets required and the distance between the barrier and the service pit. This way we can guarantee the optimal functioning of the barrier.

Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

It is an option to order an extra switch in the pump. This switch can be connected to an alarm. When the barrier rises, the alarm goes off, so the environment knows that they should pay attention.

Activation SCFB with pipe connection

When the area water is lower than the bottom of the basin the SCFB can be activated with just a pipe connection.

A pipe connection can also be used for longer lengths combination with a service pit, this results in a faster process of filling the basin.

Depending on the size of the barrier the pipe connections come in the standard dimensions 110mm 160mm.

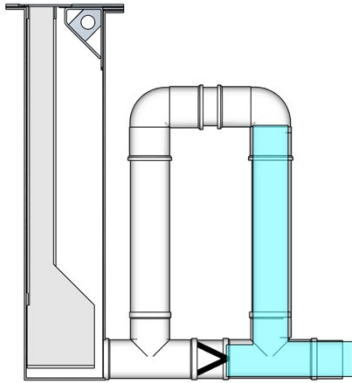
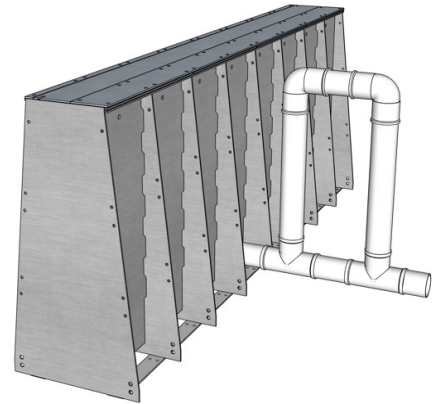


Image 1.3

Floodwater rises through storm sewers into the pipe connection

The pipe connection has a check-valve that prevents the flood water going to the basin of the barrier at this point.

This prevents the barrier from coming up early or that the barrier comes up have way.

In a slow up coming flood the barrier will still close in a short time to the end position.

The height of the of the vertical pipes determine the activation level of the SCFB

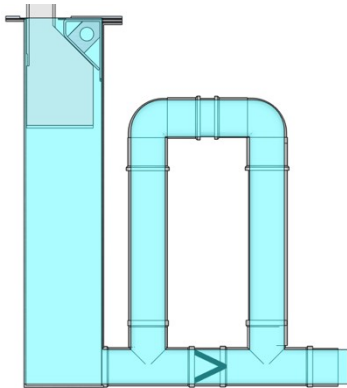


Image 1.4

When the flood water surface is coming above the filling pipe (activation level) the water starts to flow into the basin of the SCFB

De basin starts to fill, and the floating wall will raise with the water level.

As the floating wall touches the support block the wall is pushed to the dry side of the barrier the seals now make a watertight connection.

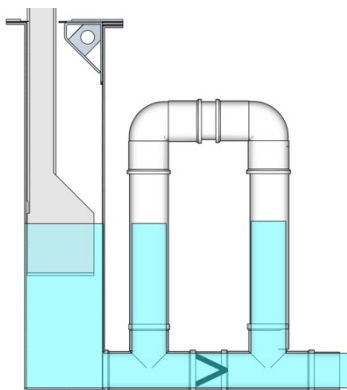


Image 1.5

When the flood water recedes the water inside the basin from the SCFB is flows back though the check-valve.

The barrier is sinking back to its resting position this happens with the same speed as the sinking flood water.

when the drain water level is higher than the bottom of the pit a pump is used to pump the water out.

Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

Activation SCFB with inspection pit

When the area water is lower than the bottom of the basin the SCFB a standard service pit can be activated with just to lower the barrier after a flood.

Depending on the size of the barrier the service pits are standard 300mm or 400mm with a pipe dimensions of 110mm 160mm.

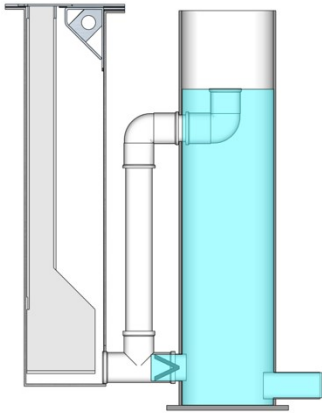


Image 2.3

Floodwater rises through storm sewers into the service pit

The service pit has a check-valve that prevents the flood water going to the barrier at this point.

This prevents the barrier from coming up early or that the barrier comes up half way.

In a slow on coming flood the barrier will still close in a short time in the end position.

The height of the of the adjustable vertical pipes inside the pit determine the activation level.

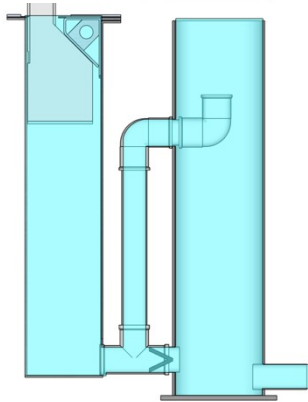
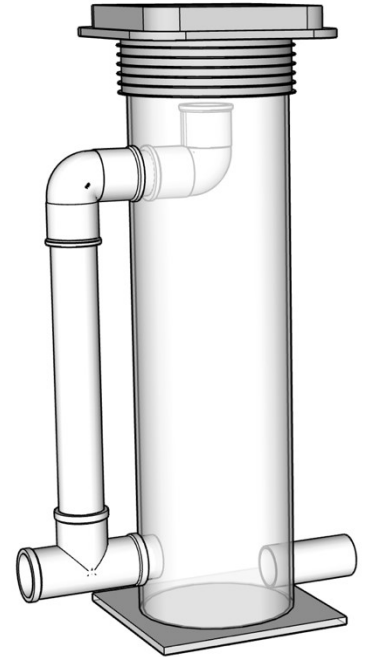


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When the flood water surface is coming above the filling pipe (activation level) the water starts to flow into the basin of the SCFB

The basin starts to fill, and the floating wall will raise with the water level.

As the floating wall touches the support block the wall is pushed to the dry side of the barrier the seals now make a watertight connection.

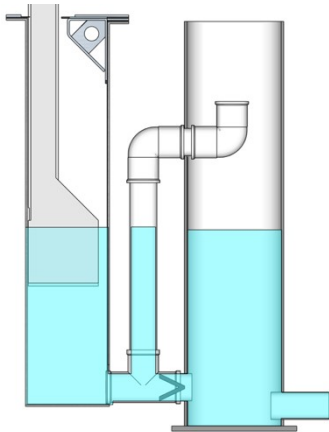


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The barrier is sinking back to its resting position this happens with the same speed as the sinking flood water.

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Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

It is an option to order an extra switch in the pump. This switch can be connected to an alarm. When the barrier rises, the alarm goes off, so the environment knows that they should pay attention.

Activation SCFB with inspection pit with pump

When the area water is higher than the bottom of the basin the SCFB a service pit with pump is necessary to lower the barrier after a flood.

The pump with floating switch will switch on when water enters the service pit. This will keep the barrier dry in a not flood situation.

In a flood situation the pump is pumping against the incoming water. When the water level reaches the top of the pit a second switch will turn off the pump.

Depending on the size of the barrier the service pits are standard 300mm or 400mm with pipe dimensions of 110mm 160mm.

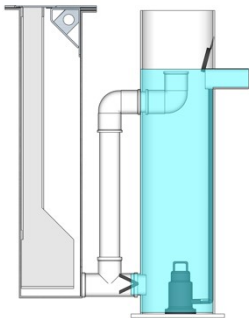


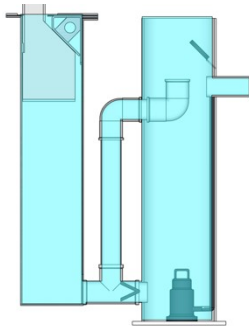
Image 3.3

Floodwater rises through storm sewers into the service pit

The service pipe has a check-valve that prevents the flood water going to the barrier at this point.

This prevents the barrier from coming up early or that the barrier comes up half way.

In a slow up coming flood the barrier will still close in a short time in the end position.



The height of the of the adjustable vertical pipes inside the pit determine the activation level.

Image 3.4

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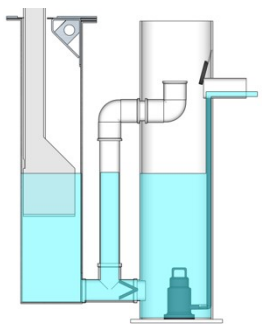


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6. Optional:

For longer lengths, it is optional to combine the pipe connection with a pit or pit with pump. This results in a faster process of filling and draining the basin.

It is an option to order an extra switch in the pump. This switch can be connected to an alarm. When the barrier rises, the alarm goes off, so the environment knows that they should pay attention.

7. Commissioning

The SCFB should be commissioned after installation; either by the distributor installation team (if supplied and installed by distributor) or by the main contractor if on a supply only contract. A full cycle of operation should be carried out to ensure the barrier rises and falls without snagging at any point of operation.

Visual Inspection

The SCFB should be inspected monthly to ensure that there is no debris or refuse trapped along the length of the lid or at the guide rails.

- Cleaning of debris from intake structure gratings. (when present) • Cleaning of silt in the inspection-pit and control pit. (when present)
- Check all visual bolts and tighten where necessary.

8. Maintenance

It is essential to have in place a Maintenance Plan of any Self Closing Flood Barrier. It should be prepared prior to final commissioning of the works.

For the system proposed on this project, the Maintenance Plan should be carried out twice a year and include at least the following:

- Hydrostatic testing of each complete system from intake structure to SCFB Unit(s) by filling with a water hose or waterworks.
- Visual Inspection of seals at the base of the rising barrier during the hydrostatic test.
- Visual inspection of seals at each end of the barrier.
- Check all bolts and tighten where necessary
- Testing of the submersible pump and the switches. (when present)
- Testing and cleaning of non-return flap valve in control-pit etc.
- Verification of alarms (when present)

The frequency of testing may be modified on experience of the system's operation.

Hydrostatic testing of the SCFB unit operation should be carried out preferable on times that there is minimum traffic. The actual test duration is dependent on the filling rate from the water supply.

PROJECT SUPPORT

Warranty

Each SCFB installed system carries a warranty against fabrication as well as installation faults. We are only responsible for the good working of the SCFB when above instructions are exercised carefully and according to our advice.

All SCFB installed systems carry a warranty against fabrication/installation faults including any incurring leakages of more than 0.1 l/m/min. All barriers carry a 10 years' manufacturer guarantee. In the event of a query relating to the installation of an SCFB please feel free to contact the technical department.

General

HYFLO Self Closing Flood Defense System BV was established in January 2014 to set up a worldwide dealer-network organization to market and sell the Self Closing Flood Barriers (SCFB) to meet the growing requirement for global solutions to extreme flooding events. HYFLO is located in Kampen, in the Netherlands.

Hyflo can supply all the services required to determine the most appropriate solution for a site. This is from initial contact, specification, survey, quotation, installation, commissioning, and maintenance.

Hyflo will be able to assist with the specification and the provision of data relating to the structural performance of the SCFB.

The barriers are built with a long design life in mind, and spare parts are not normally required. Hyflo hold a stock off spare parts and we keep records of all installations. Should any replacement part be required for any reason, we can arrange for the parts to be supplied or supplied and fitted.

Patent Protection

The Self Closing Flood Barrier SCFB is protected and reserved by international granted patents under number NL1035546 / WO2009139622, current patent applications and Trade Mark number 010390029.

hyflo
self closing flood system

HYFLO Self Closing Flood System BV
Eckertstraat 7a
8263 CB Kampen
The Netherlands

P: +31 (0) 38 458 00 93
E: info@hyflo.nl
W: www.selfclosingfloodbarrier.com

