Water barrier

User’s guide

For categories: WA, WL, WP and Water-Plug

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IMPORTANT NOTICE TO READ
IT IS STRONGLY RECOMMENDED THAT YOU READ ALL INSTRUCTIONS IN RED TO ENSURE THE SAFE INSTALLATION OF THE BARRIER.
Considering the length of the manual, a 3 code colour system has been devised based on the importance of the information required for proper installation.

EXTREMELY IMPORTANT, MUST ABSOLUTELY BE READ

- Important information based on your installation
- Interesting information to know about the product

A trial installation is strongly recommended so as to be fully prepared in an emergency situation.

DESCRIPTIVE DIAGRAM
INTRODUCTION

Congratulations for acquiring the Water-Gate water barrier. All our products are manufactured with high quality materials and have been inspected to guarantee your safety.

RESPONSIBILITY

Before using your water barrier, it is essential to read the entire user guide and conduct at least one preliminary test. This is meant to ensure you master all the steps required for installing the water barrier. The vendor and manufacturer shall in no way be responsible for faulty installation and/or faulty use of the water barrier.

WARRANTY

Each barrier was manufactured and inspected according to strict quality standards. A registration number is printed on the ends of each barrier, which is warranted against all manufacturing defects.

SAFETY STANDARDS AND RESISTANCE

Above all, the water barrier is a working tool that must be reliable, safe and durable. Based on the standards set by MegaSecur, the Water-Gate water barrier will remain 3 times more resistant than required for a minimum water retention period of 3 days. For example, if 2 out of 3 partitions of the water barrier have come off when the barrier is filled to its fullest capacity, it will still retain its entire water volume for 3 or more days.

WATER BARRIER MANUFACTURING

The manufacturing of the Water-Gate water barrier is done by experienced workers with industrial sewing machines. The stitching used on the product is called “lockstitch”. This type of stitch does not break even if the main stitch has been severed. A broken stitch does not affect the following stitches.

On top of using such secure stitching, we also provide a second parallel stitch on all partitions of the barrier (except the WL-06 model). The final stage of manufacturing consists in making a rigorous inspection of each barrier.

MAIN MATERIALS

For the WA and WL categories, PVC coated polyester canvas is used. The main advantage of this type of canvas is its resistance to abrasion. In other words, if the barrier is dragged along the ground, the risk of tearing is minimal.

For the WP category, woven polyethylene fabric is used. This fabric also resists well to tearing but is a little more vulnerable to abrasion.

All partitions in each category are manufactured with woven polyethylene fabric.

The sewing thread used is 100% polyester for all categories.

For the WL category, galvanized steel plates are used for the ballast weights.
**DURABILITY**

Considering that the water barrier is entirely made of polymer, the estimated longevity of the product can be over 20 years if the product is used occasionally and/or for short periods. Ultraviolet rays remain the most harmful factor for the components of the water barrier. However, the polymer canvas has been treated to counter the harmful effects of ultraviolet rays.

Since the barrier is entirely made of polymer, there are no risks of damage by humidity.

The barrier’s materials resist temperatures of +50°C/+120°F to -40°C/-40°F. Even when stored for several years at these temperatures (maximum certification of 10 years depending on material manufacturers), the Water-Gate remains as effective.

**MAINTENANCE**

It is strongly recommended to wash and dry the water barrier before storing it. This allows you to check for any damages that may have occurred during use. Cleaning the product with a pressure washer is strongly recommended. Dirt and trapped in humidity do not affect the quality or the resistance of the barrier, but could lead to unpleasant smells when the barrier is used again.

To clean the barrier, hang it by the rear since it is equipped with at least one rear strap every 1.52 m/5 feet. A fence or side of a garage are excellent places to wash and dry the barrier. You simply have to install hooks on the top of your fence or on the edge of the garage. One hook will be required for each rear strap.

If you plan on making continuous intensive use of the barrier, you will need to have the right equipment for proper maintenance. Adjustable poles are available for barriers with a water retention level of less than 71 cm/28 inches. These poles make it easier to hang up the barrier. All you need to do is fasten the back of the barrier at shoulder height, and then extend the poles above your hands. One pole will be required for each strap.

To measure the exact distance required to install the hooks or the adjustable poles, we suggest unrolling the barrier next to the place you’ve chosen for washing and placing a hook facing each rear strap.
STORAGE BAGS

Three types of storage bags are available depending on the barrier category and model. The “drawstring” type is the most popular because it is easy to use and less expensive. The “handbag” type provides quick access to the barrier and is easy to handle. Finally, the “blanket” type bag is used for heavier barriers that may require handling by more than one person.

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<tbody>
<tr>
<td>Storage bags</td>
<td>Drawstring bag</td>
<td>●</td>
<td>●</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
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<td>●</td>
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<tr>
<td></td>
<td>Handbag</td>
<td>⬜</td>
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<td>Blanket</td>
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REPAIRS

In the event that your barrier is damaged in any way, we suggest you get it repaired by professionals who are used to working with this kind of material. Take your barrier to a business that usually works with canopies, canvas truck covers, tents or car shelters. This could even be your local shoe repair store. Repairs can vary in cost depending on the damages incurred.

1. For the WA and WL categories, if there’s a tear or perforation in the PVC canvas, several methods can be used. These include contact cement for PVC, ultrasonic or thermal gluing, or sewing to another piece of material.
2. For the WP category and the partitions of all categories, if there’s a tear or perforation in the polyethylene fabric, repairs are limited to sewing to another piece of fabric or applying adhesive tape specially made for that purpose.
3. If one or more partitions are torn along the seams, it could be very difficult and maybe even impossible to repair such damages. However, for the WA and WL categories, you can cut your barrier in half, pull out the ripped or damaged partitions, and glue your barrier back together.

STORAGE

The barriers can be piled one on top of the other, upright or flat, without this hampering their deployment. However, storing the barrier in a vertical position is highly recommended to maintain its shape when rolled up. We don’t recommend setting the barrier directly on a damp surface. It is best to lay it on a wooden pallet.

If there is water trapped inside the barrier during storage, this will not affect product longevity as long as the water is dirt free. Fallen leaves and other waste material left inside the barrier can damage and dry up the fabric, thus reducing the useful life of the barrier. When the barrier is properly washed and stored, it does not emit any smells. However,
improper cleaning and storage may lead to some unpleasant smells when the barrier is deployed once again.

Every barrier should be kept in its storage bag or crate for protection against UV rays, dirt, and damages, as well as easier handling during transport.

As far as rodents are concerned, they are not attracted to polymer canvas and will not chew this type of material.

**HOW THE WATER BARRIER WORKS**

The principle is simple: water accumulates inside the barrier and exerts pressure on the bottom of the fabric, which keeps the barrier in place. The speed or direction of the incoming water is not important, as it is the water pressure that causes the barrier to open up.

**WATER HOLDING BACK WATER**

The surface of the barrier on the ground is 4 times greater than its water retention height, which means it has 4 times more vertical thrust (toward the ground) than horizontal thrust, allowing for good adherence. In order for water to be able to hold back water on most surfaces such as asphalt or grass, a ratio of 1 to 2½ is generally sufficient to ensure safety. With a ratio of 1 to 4, the Water-Gate barrier is obviously very safe and the chances of it slipping are very slim. The wider the barrier is, the less likely it is to slip. To conclude, the Water-Gate water barrier is 33% safer than required.
# RESISTANCE TO CHEMICALS

The materials were tested by an independent professional chemist using commercial solvents. The table below shows the results of trials made with the materials constituting the barrier. If a single element (such as the sewing thread or other) proved unsatisfactory during the trials, the results as a whole were rejected. It should be taken into consideration, however, that the physical properties of some solvents can be altered when they are mixed with water, creating a thermal reaction that can cause the barrier materials to melt.

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Categories WA and WL</th>
<th>Category WP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inorganic Acids</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrochloric acid or Aqueous hydrogen chloride</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Hydrofluoric acid or Hydrogen fluoride</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Anhydrous hydrobromic acid</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>or Hydrogen bromide</td>
<td>Discoloration</td>
<td></td>
</tr>
<tr>
<td>Nitric acid or Hydrogen nitrate</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Phosphoric acid or</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Orthophosphoric acid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfuric acid</td>
<td>Not recommended</td>
<td>Not recommended</td>
</tr>
<tr>
<td><strong>Bases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium hydroxide or Caustic soda</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td><strong>Hydrocarbons</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasoline, Diesel, Oil</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td><strong>Non-polar Solvents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petroleum ether or Petroleum benzine</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>or Light ligroin or Rubber solvent or Naphtha</td>
<td>Major repairs</td>
<td>Major repairs</td>
</tr>
<tr>
<td>n-Hexanes or Dipropyl</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>p-Xylene or Thinner fast dry TY25635</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Toluene or Toluol</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Chloroform or Trichloromethane</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Dichloromethane or Methylene chloride</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td><strong>Polar Solvents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetone or Methyl ketone</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Acetic acid (glacial)</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Ethanol or Ethyl alcohol</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Methanol or Methyl alcohol</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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<tr>
<td>Formaldehyde or Formic aldehyde</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Methyl ether ketone or Ethyl methyl ketone</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
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<tr>
<td>Tetrahydrofuran or Butane</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
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<tr>
<td><strong>Others</strong></td>
<td></td>
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<tr>
<td>Ethyl acetate or Acetic acid ethyl ester</td>
<td>Not recommended</td>
<td>12 hours resistant</td>
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<tr>
<td>Acetic anhydrous or Acetic acid anhydrive</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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<tr>
<td>Paint thinner</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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<tr>
<td>Ammonium hydroxide or Ammonia solution</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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<tr>
<td>Hydrogen peroxide or Hydrogen dioxide</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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<tr>
<td>Calcium hydroxide</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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<tr>
<td>Ferric chloride (anhydrous) or Iron trichloride</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
</tr>
<tr>
<td>Sodium hypochlorite (5%) or Bleach</td>
<td>12 hours resistant</td>
<td>12 hours resistant</td>
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12 hours resistant: The Water-Gate will resist for 12 hours
Not recommended: The Water-Gate is not resistant to this fluid
Inspection: Check for possible alterations of the containment shell (appearance, rigidity)
Major repairs: Degradation of the containment shell
FOUR GOLDEN RULES TO FOLLOW FOR ALL CATEGORIES

1. Never try to contain a leak at the back of the barrier
If there are leaks, stop the water from coming in at the front of the barrier. In most cases, such problems are caused by water infiltrations at the front. Trying to contain a leak at the back of the barrier will create a pool of water and make the barrier unstable.

2. Pump the water at the back of the barrier
It's important to leave a reasonable amount of space between the building and the back of the barrier in order to install a water pump and be able to move freely. The water seeping underneath the barrier should not be left to accumulate behind the barrier. This is why the area should be kept dry using one or more water pumps.

3. Place an even amount of weight at the front
Do not tie the barrier to the ground, as it uses the weight of the water to stop oncoming water. However, it is very important to place even weights along the entire length of the front flap to minimize water infiltrations underneath the barrier and keep it on the ground. Depending on the required application, MegaSecur offers models with integrated ballast weights for quick installation. Make sure these weights are well secured to the front flap and cannot come loose.

4. Prevent water from accumulating under the barrier
Remove all objects likely to create water infiltrations under the barrier flap. The barrier is designed to stay in place on all surfaces such as asphalt, gravel, lawns, and concrete paving blocks, but if there is too much water under the flap, the barrier will not adhere as well and may slip. It is thus important to make sure that the ground is free of objects that could cause water to accumulate under the barrier.

TYING TOGETHER TWO WATER BARRIERS

To tie together two water barriers, BOTH BARRIERS MUST BE COMPLETELY UNFOLDED AT THE ATTACHMENT JOINTS.

All our barriers, regardless of category or size (water retention), can be tied together, except for the smallest 6”/15 cm model, which can only be tied to barriers of the same size.

To tie together two water barriers, a straight surface is required, especially under the joint where the two barriers will be attached. Do not tie barriers together in moving water. If the temperature is below freezing, the water in the velvet strips and hooks may freeze, making it impossible to tie the barriers together.
1. The first step consists in completely unrolling and unfolding the two barriers and laying them one next to the other.

2. Both barriers must be aligned at the back. Make sure the joints are open.

3. Open the top fabrics on each side to uncover the bottom joints and insert the barrier on the right into the one on the left.

4. Close up the velvet strips and hooks by laying them one on top of the other from the back. Good dexterity is required to close up the back.

5. Keep closing up the velvet strips and hooks from the back until you end at the front.

6. When you are done with the joint at the bottom, insert the partition of the barrier on the left in the partition of the barrier on the right and close off the top parts.

7. Close up the velvet strips and hooks by laying them one on top of the other, the same as you did for the bottom joint.
Use the same method to tie together two barriers of different sizes. Make sure the two barriers are aligned at the back.

The two barriers are now attached. Refer to the category of barrier you possess to know how to proceed with the configuration you require.

IDENTIFICATION NUMBER

To properly identify its barriers, MegaSecur assigns them a number identifying their category and size. The first two letters represent the category and the two numbers after the dash designate the maximum water retention height in inches. The last two numbers show the length of the barrier in feet.

Example: WA-2130 model

WA = Identifies the barrier category. (See “Applications for the Three Different Categories” below)
21 = Water retention height: 21 inches or 53 cm
30 = Length of the barrier: 30 feet or 9.1 m

APPLICATIONS FOR THE THREE DIFFERENT CATEGORIES

MegaSecur developed the water barrier to control floods. In time, users found it could also be used for other applications. This enabled the development of new barrier categories based on these applications.

1. WA category: This category is mainly designed for use in waterways. It can also be used to control floods but does not meet standards for this type of application.
   a. Firefighters find it ideal for gathering water from streams that are too small to collect water from using a suction hose.
   b. Contractors find it very useful for doing dry work in streams and rivers while respecting the environment.

2. WL category (FM Approved version): This category is specifically adapted to flood control. It is made for intensive use and can be set up in record time.

3. WP category: This category is also designed for the control of floods. It is as sturdy as the other categories but is more vulnerable to abrasion, which explains its lower cost.

Refer to the appropriate instructions based on the category of barrier you have acquired.
### MAIN FEATURES OF THE WA CATEGORY

**Designed for waterways.**

A - Polyester fabric coated with super heavy-duty, abrasion-resistant PVC suitable for use in streams with doubtful bottoms.

B - Compact partitions leaving the front flap free to stand or walk on for pumping water and crossing the stream more safely.

C - Metallic rings or polypropylene front straps to facilitate installation in some situations.

D - Anti-erosion flap to keep the bottom of the stream from eroding if the water flows over the barrier.

E - Heavy duty polypropylene back straps to facilitate handling.

### TWO PRINCIPLES OF ADHESION OF THE BARRIER INSTALLED IN STREAMS

**1st principle:** The pressure of the water on the bottom fabric of the barrier makes the barrier stick closely to the uneven bottom of the stream. It is as if there were studs holding down the bottom of the entire water filled surface of the barrier. The more the bottom of the stream is uneven, the more the barrier adheres perfectly well.

The water barrier will adhere very well in the great majority of streams and rivers. However, the bottom of some streams may cause problems if they mainly consist of sand or hard and smooth clay. Here are 3 types of bottoms that you are likely to come across:

A. Bottom of a normal stream composed of gravel: ± 95%
B. Bottom of a stream only covered with sand: ± 3%
C. Bottom of a stream composed of clay: ± 2%

**A. Bottom of a normal stream composed of gravel:** This type of bottom is found in the great majority of streams and rivers (± 95% based on our estimate). It consists of small gravel and/or big rocks. The barrier responds very well in this case. However, if the gravel is very thick, water infiltrations are likely to occur. To keep water from flowing under the barrier, make a trench across the stream and bury the front flap of the barrier.

**B. Bottom of a stream only covered with sand:** This type of ground is rarely found in streams (± 3% based on our estimate). The barrier adheres well to a sandy bottom, but you have to make sure that there are no water infiltrations under the barrier during installation. If this occurs, what may start out as a small leak can become difficult to control and especially to stop. After some time, the leak can become so big that the barrier will sink into the hole made by the water and end up slipping. This phenomenon is called piping. Setting up the barrier in this type of stream is not...
recommended. However, if it has to be done, the following precautions should be taken: 1) Bury the front flap of the barrier in the sand at a depth of more than 15 cm / 6 inches. 2) Place sandbags along the entire length of the front flap of the barrier. 3) Insert a plastic tarp under the joints if 2 barriers have to be tied together in order to prevent infiltrations that could lead to piping.

C. Bottom of a stream composed of clay: Certain streams are completely covered with clay (± 2% based on our estimate). The clay can be either solid and very slippery or unsteady and viscous. This type of bottom is rather rare, but when encountered, caution should be taken by better insulating the front of the barrier.

The Water-Gate water barrier adheres to this type of ground. However, as soon as the water level reaches the full capacity of the barrier, the danger of slipping is increased because of the slippery surface. The following precautions should be taken in these conditions: 1) Place stakes behind the barrier so that it can lean against these stakes if it starts to slip. 2) Put ballast weights along the full length of the front flap to prevent water infiltrations under the barrier or bury the front flap.

2nd principle: The adhesion of the water barrier in a stream also depends on the following factors:

A. Overflow of water over the barrier
B. Surplus of water at the back of the barrier
C. Overflow of water over the barrier with a surplus of water behind it

The examples below are based on an installation in a stream with a bottom covered with medium size rocks and gravel. The result can be very different if the surface on which the barrier rests is more uneven or smoother.

A. Overflow of water over the barrier: The situation shown in Figure 1 is not likely to occur because there is no accumulation of water behind the barrier. In this case, the barrier can hold a surplus of water of up to about 33% on top. This approximate percentage represents the point at which the barrier will slip.

B. Surplus of water at the back of the barrier: The situation shown in Figure 2 is the opposite of that in the previous figure. The risk of slipping is the same as in Figure 1, as the maximum acceptable amount of water behind the barrier is also ± 33%.
C. Overflow of water over the barrier with a surplus of water behind it: The situation shown in Figure 3 occurs regularly. The water over the barrier added to the water behind it adds up 33%. Based on the slope and the flow of the stream, the surplus upstream can vary but the total amount of excess water cannot exceed 33%.

 IDENTIFYING THE MINIMUM BARRIER LENGTH REQUIRED FOR A STREAM

Before deploying and installing the water barrier in a stream, it is important to determine the required barrier length.

Start by identifying the maximum water level A that can be reached by the water as it accumulates where the barrier will be installed. B is the water level before the installation of the dam. Add an additional distance of about 50 cm / 20 inches on each side. When the distance is determined, add another 4% to 6% to your initial measurement. This additional length will compensate for the fact that the fabric is stretched over an uneven surface and has to go around the large rocks at the bottom of the stream.

The barrier must be long enough to prevent the water from flowing out at the sides, otherwise it is almost sure to slip. On the other hand, it can’t hurt if the barrier is longer than required. The opposite illustration shows the perfect efficiency of the half-deployed barrier in this situation.
PREINSTALLATION ADVICE
Here is some practical advice for a successful installation right from the first try.

1. Make sure that the barrier is facing in the right direction based on the pictogram and instructions on the barrier.

2. Here are two good comparable methods to install the water barrier across a stream.

a. From one side of the stream, unwind the barrier flat on the ground and pull it across the stream.

b. Unwind the barrier directly in the water. This method can only be applied from one side of the stream because of the direction of the stream and the direction of the rolled up barrier.

The speed of the current in a stream does not generally affect the installation of the barrier. The unwound barrier will float if the current is very weak; if it is strong, the water barrier will sink to the bottom of the stream. There is little chance of the barrier drifting away with the current or being automatically deployed.

3. One last word of advice before installing the barrier: think about the possibilities for easy removal. There are various ways to remove the barrier but the most used is the fast method of removal. To do this, identify the side where the water has to be released from the barrier. This side will have its end slightly above the limit of the level of the accumulated water. By proceeding this way, the barrier becomes as easy to remove as it is to install.
INSTALLATION OF THE WATER BARRIER IN A STREAM

After the water barrier has been unwound across the stream, make sure that the water does not go over the sides because the barrier is not long enough. (See the section entitled “Identifying the Minimum Barrier Length Required for a Stream” on p.12)

The following step is crucial for the successful installation of the barrier. Based on our estimates, we recommend having one person for every 3 m / 10 feet of stream width.

- Stream 3 m / 10 feet wide: 1 person is generally sufficient
- Stream 6 m / 20 feet wide: 2 people are strongly recommended
- Stream 9 m / 30 feet wide: 3 or more people are required

Of course, having an extra person will always be useful, especially if the current is strong.

1 – Plan to put ballast weights or rocks the size of your fist and even 3 times as large upstream from where the barrier will be installed. Use at least one rock or set of ballast weights for every foot or 30 cm / 1 foot along the part of the front barrier flap that will be underneath the water.

2 – After identifying the exact location for your installation, begin to deploy the front flap and MAKE SURE THAT NO WATER ENTERS THE BARRIER by lifting up the front flap.

3 – Quickly push the front flap of the barrier to the bottom of the stream. Once this step has been completed, no more adjustments can be made.

4 – At the same time, place your feet on the front flap to weigh it down temporarily while you put your previously gathered ballast weight, rocks, or sandbags in place.
N.B.: The water tightness of the barrier will mainly depend on how much water gets underneath it. No barrier installed in a stream can be completely watertight because the bottom of the stream is generally covered with rocks and gravel. However, if you make a groove at the bottom of the stream, you can use it to bury the front flap of the barrier and obtain very good water tightness.

**USES FOR THE FRONT STRAPS**

Here are the main uses for the front straps:

1. Attaching our model of ballast weights to make sure they stay fastened to the front flap of the barrier. (See the section entitled “Converting a WA Category Barrier into a WL Category Barrier” on p. 17)

2. Dividing up the water in a lake or pond. In this situation, unwind the barrier on the water and attach the front straps of the barrier to the bottom of the lake or pond. Then add evenly distributed ballast weights along the entire length of the front flap and pump the water behind the barrier. Attaching the barrier with stakes at the bottom of the lake or pond will prove very helpful when you begin to install the barrier, as the posts will hold it in place until the back is almost dry.

3. Holding back the ends of the barriers when there are steep slopes on the side of the stream.

4. The front straps should never be used to attach the barrier with posts at the bottom of a stream to create a pool of water. Keeping the barrier down with posts can lead to water infiltrations under the barrier, as the posts will prevent the front of the fabric from being pressed tightly against the bottom of the stream. As time goes on, more and more water can seep under the barrier and cause it to slip.
1 – After removing the ballast weights, lift the corner of the front flap and let the water flow under the barrier.

2 – Continue by lifting a wider part of the front flap until the barrier begins to slip.

3 – Move forward with the slipping barrier and support the front flap to keep it out of the water. This precarious operation is recommended to prevent the barrier from rolling up and make it easier to take it out of the stream.

4 – As soon as the barrier is stabilized, allow the water in the stream to flow normally.

5 – To remove the water barrier, pull toward the back. Use the handles specially provided for this operation.
- COMPLEMENTARY INSTRUCTIONS FOR THE WA CATEGORY -

**USE OF THE BACK STRAPS**

The back straps are mainly designed to remove the barrier from the water and hang it up to facilitate cleaning and drying. Do not pull on the back straps if the weight to be supported is no more than 150 kg / 330 lbs. The solidity of every back strap was tested at 200 kg / 440 lbs. Although the straps resisted at that level of tension, the material was slightly deformed.

In certain conditions, the back straps can also be used to hold back the fabric of the barrier when there is a steep slope or prevent the barrier from drifting if the water is flowing toward the back of the barrier.

**CONVERTING A WA CATEGORY BARRIER INTO A WL CATEGORY BARRIER**

If you are using the WA category for the control of floods, refer to the instructions for the WL and WP categories, as the WA category will not adhere as well to some surfaces.

To convert the WA category barrier into an anti-flood barrier (WL), you must place ballast weights on the front flap. These ballast weights must be heavy enough so that it won’t be carried away by the current. Furthermore, they must be properly fastened to the front flap so that they cannot slip away from this area of the barrier. Otherwise, the barrier will be very likely to slip. The ballast weights must be evenly distributed along the entire length of the barrier front flap.

MegaSecur innovated by creating ballast weights designed to be fastened using the front straps of the barrier flap. These ballast weights are made from polyester filled with fine gravel.
**FOLDING THE BARRIER FOR STORAGE**

It is very important to fold the fabric correctly before the water barrier is stored. Improper folding may jeopardize the installation of the barrier when it is reused.

1 - After cleaning and drying the barrier, lay it on a large smooth surface.

2 - With the help of a stick, make sure that all the partitions of the barrier are smoothed out.

3 - Before folding the barrier, keep all the joints open to make it easier to attach another barrier if required.

4 – To begin, fold the anti-erosion flap.

5 – Fold a first part of the back of the barrier by following the folds already appearing in the fabric.

6 – Based on the barrier model, a second fold is often necessary. You have finished folding the back of the barrier when you reach the barrier float.
7 – Next fold a first part of the front flap following the folds on the fabric.

8 – Finish folding the front flap by folding it over the back of the barrier as a whole.

9 – Roll up the barrier on the opposite site of the banner.

10 – When properly rolled up, the barrier should look like this.
-- COMPLEMENTARY INSTRUCTIONS FOR THE WL and WP CATEGORIES --

----- WL and WP Categories -----

● MAIN FEATURES OF THE WL CATEGORY (FM Approved version)
Designed for flood control – For industrial use.

A – Polyester fabric coated with super heavy-duty, abrasion-resistant PVC suitable for use on all types of surfaces.
B – Stretched partitions providing better adherence to smooth surfaces.
C – Polypropylene straps to lift up the ends during specific installations.
D – Galvanized metal plate ballast weights held in polyester netting sewn to the water barrier.
E – Extra resistant polypropylene straps to facilitate handling.

● MAIN FEATURES OF THE WP CATEGORY
Designed for flood control – For occasional use.

A – Very resistant polyethylene fabric with the same high quality standards as the other models.
B – Stretched partitions providing better adherence to smooth surfaces.
C – Polypropylene straps to lift up the ends during specific installations.
D – Polyester netting sewn to the water barrier allowing the insertion of weights or small sandbags to be used as ballast.
E – Small polyethylene bags that can be filled with sand.
F – Extra resistant polypropylene straps to facilitate handling.

● DIFFERENCES BETWEEN THE WL AND WP CATEGORIES:
Both categories are compatible, but there are significant differences between the two.

1. Folding: Each of these categories is folded differently. When the WL category is deployed, the ballast weights immediately drop to the ground, while the WP category is folded in such a way as to enable the ballast weights to be inserted on top of the barrier flap.

2. Materials: The strength and safety standards of the two categories are comparable although they are made from different materials. The WL category is made from yellow PVC fabric that’s very resistant to abrasion while the WP category is made from very lightweight, orange polyethylene fabric.

3. Ballast weights: Ballast weights are already included with the WL category. With the WP category, however, ballast weights must absolutely be inserted.

4. Applications: The WL category is mainly designed to be put in a crate from which it can quickly be deployed to cover great distances while the WP category is packaged individually and intended for targeted protection.
ADHERENCE OF THE BARRIER WHEN INSTALLED ON A SMOOTH SURFACE

The water pressure exerted on the fabric at the bottom of the water barrier is 4 times that of the pressure exerted on the side (see “WATER HOLDING BACK WATER”, p.6), which is amply sufficient to hold down the barrier on most surfaces found outdoors (asphalt, lawn, gravel, concrete paving blocks, etc.). However, some exceptionally smooth surfaces, such as tarred asphalt or polished cement, require particular attention. What happens with this type of surface is that the water stays trapped between the fabric at the bottom of the barrier and the smooth surface. The result is the same as driving with completely worn down tires.

It is very important to understand what it takes to ensure that the barrier adheres properly to the ground: AT NO TIME SHOULD WATER ACCUMULATE UNDERNEATH THE BARRIER. When deployed on regular asphalt, the barrier is very safe due to the presence of small cracks in the asphalt that enable the water to drain through to the back of the barrier.

If the barrier has to be installed on an EXTREMELY SMOOTH surface, you need not worry about its stability. All you have to do is simply take some additional precautions. Here are a few solutions:

1. Apply a food substance such as molasses, caramel or even bread dough underneath the ballast weights and along the entire length. This substance will fill in the spaces between the bumps on your surface (asphalt, paving blocks, etc.) and will also stick very well to the fabric of the barrier. This process is ideal to eliminate water infiltrations and also improves adherence. This efficient technique is also environmentally safe! If the barrier is installed on a lawn, you can make a trench and bury the front part (or ballast weights) of the barrier.

2. Place stakes at the back of the barrier at a reasonable distance (1 to 3 metres/3 to 10 feet) or even have the sides of automobiles rest against the back of the barrier. This technique ensures that the barrier will not slip. Should the barrier begin to slip, it would gently be stopped by the stakes, posts or automobiles and would hold back the flood without damaging anything.

Usually none of these precautions are necessary, but we believe that if you use one or two of these methods at the same time, it would be impossible for the barrier not to stay in place.
DETERMINING THE HEIGHT AND LENGTH OF REQUIRED BARRIERS

Straight lines are easy to determine, but we recommend adding 1% to 3% of extra barrier length. This slight addition is necessary due to the imperfections of the surface and because the material may have undergone a small amount of shrinkage during manufacturing.

To go around a building, the calculations are somewhat more complex, but our instructions will help simplify your installation.

1. Keep an adequate amount of space between the protective barrier and the building:

No matter where you decide to set up your protective dam, you need to have an adequate amount of space (S) to be able to move around and place pumps of appropriate capacity to remove all the water at the back of the barrier. The barrier should never rest against the wall of the building. To maximize protection, set up the barrier as far as possible from the location you want to protect.

2. Determine the water level of the flood:

It is important to choose barriers that are not smaller than required for the expected water level. Be careful on sloping ground, as the water level reaching the house will certainly be lower than the water level where your barrier will be installed. As soon as you have chosen the barrier with the right water retention capacity, calculate 2 times its water retention to determine where to place the back of the water barrier.

3. Determine the length of the barriers:

To determine the required lengths, you must absolutely measure the distance to the outermost point (D) on the barrier and also consider the relief of the ground. You must also add 1% to 3% in length to cover the imperfections on the ground. In the opposite illustration, the red line (L) (or ballast weights) determines the length of the required barriers.

Reference table, if required

<table>
<thead>
<tr>
<th>Model</th>
<th>Water retention</th>
<th>Half-width</th>
<th>Total width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 X</td>
<td>2 X</td>
<td>4 X</td>
</tr>
<tr>
<td>WL-14 and WP-14</td>
<td>35 cm / 14&quot;</td>
<td>56 cm / 22&quot;</td>
<td>1,5 m / 60&quot;</td>
</tr>
<tr>
<td>WL-20 and WP-20</td>
<td>50 cm / 20&quot;</td>
<td>1 m / 39&quot;</td>
<td>1,8 m / 71&quot;</td>
</tr>
<tr>
<td>WL-26 and WP-26</td>
<td>67 cm / 26½&quot;</td>
<td>1,3 m / 50&quot;</td>
<td>2,5 m / 98&quot;</td>
</tr>
<tr>
<td>WL-39</td>
<td>1 m / 39&quot;</td>
<td>2,3 m / 90&quot;</td>
<td>4 m / 160&quot;</td>
</tr>
</tbody>
</table>

S = Adequate space at the back of the barrier
1 X = Size of water retention
2 X = Size 2 times the water retention size
4 X = Size 4 times the water retention size
D = Calculation distance for barrier length
L = Required barrier length
MAKING A CORNER OR CURVING THE WATER BARRIER

To make a corner or curve the barrier, the entire corner or curved section MUST BE COMPLETELY UNFOLDED.

As explained previously, the furthest edge of the barrier must always be taken into consideration to determine the length of the required barriers. The blue dotted line on the photograph shows the required barrier length. The barrier can be curved to any given angle, however, we recommend curving it in such a way as to repel the water. If you use the opposite method, making corners to contain the water, chances are that a lot of water will seep through under these corners and too much water seeping through can cause the water barrier to slip. This is why we do not recommend curving the barrier to contain water, even if this method can work very well.

The barrier is better adapted to and safer for repelling water, as the ballast weights at the front remain evenly seated against the ground and do not fold over, keeping water leaks under the barrier down to a minimum.

Here are 4 installation methods that you will find useful. You don’t have to worry about the deployment of the water barrier, as the pressure from the water will force the corner to be deployed properly.

1. Square corner to repel the water: This method is the one most often used to protect a building. The barrier can be curved to all angles, including angles greater than 90°.

1 – Completely unfold the water barrier.

2 – Place ballast weights on the front flap of the barrier and turn to the desired angle.
2. Square corner to contain the water: This method is rarely used and is not recommended, but can work very well if you are able to eliminate the infiltrations at the front and especially at the corner of the barrier.

1 - Completely unfold the water barrier.

2 – Place ballast weights at the back of the barrier and curve the barrier to the angle required to contain the water.

3 – Pull the material closer and smooth out the upper fabric.

4 – Place ballast weights over the entire surface of the front flap to prevent infiltrations at the joints.

3 – Pull the material closer and smooth out the top fabric.

4 – You can remove the ballast weights used to make the corner. The water barrier should now look like this.
3. **Marking a round curve to REPEL the water:** Mainly used for winding roads, this type of deployment is generally made using several barriers contained in a crate and tied together. If the curve is pronounced, it is better to completely unfold the rounded section of the barrier to make sure the ballast weights are evenly distributed on the ground.

1. Completely unfold the water barrier.
2. Give the barrier the desired curve.
3. Keep the ballast weights at the back evenly distributed to keep the fabric on the ground and prevent the wind from lifting up the barrier.
4. Without ballast weights, the folds in the fabric are exposed to the wind. This opening may cause the barrier to be lifted, jeopardizing the installation.

4. **Making a round curve to CONTAIN the water:** Used on winding roads, but in the opposite direction as that shown in the previous figure. If the curve is somewhat pronounced, the rounded section of the barrier must be completely unfolded. Such particular attention is required to make sure that the barrier is not stretched and to prevent water infiltrations from underneath the steel plates, which will tend to compress and lift up.

1. Completely unfold the water barrier.
2. Curve the barrier as needed, making sure the back of the barrier is not stretched.
HOW THE ENDS OF THE WATER BARRIERS SHOULD BE PLACED

The ends of the water barriers are not closed off, as they must rise up higher than the level of the flood. Since the water flows freely inside the water barrier, the front and/or back sides of the barrier must be higher than the maximum flood water level. The 3 photographs below show that it is important for the barrier to be sufficiently longer than the wall or ledge so that no water will flow out from the ends. Extra barrier length will also provide maximum safety.

L = Flood water level or maximum water barrier retention.
E = Extra barrier length. We recommend a minimum extra length of up to 50%, depending on the flood water level.

In addition, every time the barrier is abruptly lifted against a wall, a space is created and water will infiltrate from the corner. We strongly recommend placing one or more sandbags on that corner. The water pressure exerted on the barrier stretches the fabric, thus creating a wider opening promoting infiltration in that corner.

THE WP CATEGORY REQUIRES BALLAST WEIGHTS

The main advantage of the WP category is that it is lightweight and compact. However, since it is not equipped with ballast weights (very important), it must be folded differently than the WL category. With the WP category, you must completely unfold the barrier, then unfold the front flap of the barrier and insert a sandbag specially designed for that purpose. The instructions for filling our sandbags that have been specially adapted for the WP category are printed on these bags.
PROTECTING AN ENTRANCE

The water barrier is not designed to be installed in a door frame. For adequate protection, you must go around the door and lift up the ends of the barrier on each side of the wall. This type of protection requires extensive barrier length based on a calculation of the exterior barrier contour.

Using Water-Gate water barriers for your doors will give you better protection, as you will be able to pump up any water infiltrations before they reach your door. You will also maintain access to the exits of your building at all times.

If you decide to only protect the entrances instead of all the walls of your building, make sure that no water can seep in through the walls. The opposite photograph shows an air hole in a brick wall. Such holes are found on all insulated brick walls. Make sure you fill in these small holes before the flood and clear them again after the flood.

INSTALLATION ON A MANHOLE

Under no circumstances should you install your water barrier on a manhole, unless you are absolutely sure that it will not overflow during the flood. If your water barrier has to be set up in a location where there is a manhole, you must absolutely find a way around the manhole and choose another path. The simplest solution is to install the barrier behind the manhole. You can also set it up in front. If you choose this second solution, you will have to close up the manhole. We also have a product designed for manhole backup. For more information, see our section entitled “INSTRUCTIONS IN CASE OF MANHOLE BACKUP”.

NEVER SET THE BACK OF THE WATER BARRIER AGAINST A WALL

If you set the back of the water barrier against a wall, water will slowly accumulate between the wall and the barrier. The water gathered at the back of the barrier will then seep into your building. This will also have the effect of destabilizing the barrier.

Wrong method

Right method
**IMPORTANCE OF HAVING WATER PUMPS**

No matter what type of protective dam you use, a certain amount of water will almost always flow into the protected area. Water pumps are as important as your protective barrier. Make sure that if a flood occurs you will be able to use your pumps and they will be in good operating condition. We strongly recommend having a generator to power all your water pumps or having gas operated pumps. Without these water pumps, the accumulated water leaks will invade your protected area and your protective dam will be useless. These leaks can be due to a number of different factors:

- Wet ground that becomes permeable
- Small cracks under or through the dam
- Sewage pipes
- Unbalanced water pressure due to the flood

When you install one or more water pumps, it is important to leave enough space between the building and the back of the barrier to allow you to move freely and regularly check the pumps. Make sure your pumps have enough power to pump up all the water flowing under the barrier and prevent this water from reaching the wall of the building.

It is hard to determine the number of pumps needed and their required capacity, but we do recommend having a minimum of 2 pumps, one for the basement and the other to put between the wall of the building and the protective dam. For water getting through your dam, you will need a pump with a capacity of 2 to 14 liters/minute for each linear meter of dam. The required pump capacity mainly depends on the type of ground involved and where the dam is installed.

**ELIMINATION OF WATER INFILTRATIONS UNDER THE BARRIER**

The secret of a safe water barrier installation starts by reducing water infiltrations under the barrier to a minimum. To do this, it is important to remove any objects underneath the barrier in order to evenly place ballast weights on top.

You should note that should the barriers traverse a sudden rise in terrain such as a curb, it is important to sandbag the corner of that rise to prevent water infiltrations at that point.

Be careful: When the flood water enters the barrier, the fabric could contract and create new spaces allowing the water to flow under the barrier. You must always keep an eye out to make sure this doesn’t happen.
**BARRIER REACTION TO THE WIND**

The water barrier can be installed fairly easily, even in high wind. The wind’s strength isn’t on the ground. Everything higher up that gets taken away by the wind ends up on the ground and eventually comes to a standstill. Since the water barrier gets unrolled on the ground, it is less exposed to the wind than objects further up!

The barrier can easily be kept on the ground in very strong wind, however, some additional precautions do have to be taken. Although the wind is weaker on the ground, a vacuum can be created on top of the barrier and cause it to lift up.

If possible, to minimize the effect of gusting wind, keep the barrier folded and add a sufficient number of ballast weights to keep it tight against the ground. When the flood water arrives, the barrier can be unfolded and will automatically deploy based on the position of the ballast weights. To ensure the barrier is properly deployed, push off any ballast weights that are in the way.

Increase the number of sandbags if the wind gets too high. Their weight, as well as the pressure of the wind blowing on the surface of the fabric and against these sandbags will reduce the vacuum effect.

Another solution that we believe will make our water barriers capable of resisting the worst winds known up to now would be to place a net on the deployed barriers. This net would be attached to the ground at the front and back of the barriers. When the flood water arrives, it will go through the net and gather in sufficient quantity inside the barriers to ensure a protection of several centimetres. After this is done, you can remove the net to allow the barrier to be fully deployed. The water already in the barrier will weigh down enough to maintain the barrier on the ground.

**IMPORTANCE OF NOT TYING THE WATER BARRIER TO THE GROUND**

We do not recommend tying the water barrier to the ground for 2 reasons:

- The barrier tends to contract as it fills up with water. Tying down the barrier will put tension on the front flap, which will create spaces for the water to flow through since the fabric cannot remain tightly against the ground.
- Tying the barrier to the ground can complicate things if a new configuration is required.
- COMPLEMENTARY INSTRUCTIONS FOR THE WL and WP CATEGORIES -

◆ FOLDING UP THE WATER BARRIER FOR STORAGE
Folding the WL category is different from folding the WP category. It is very important to fold each category of water barrier as it should be. When the WL water barrier is deployed, the ballast weights sewn on the flap immediately weigh down the barrier, contrary to the WP category, which requires the insertion of ballast weights. This is why the folding of the 2 categories of barriers is different.

Folding of the WL category  (model WL-1430 illustrated)

1 – After cleaning and drying the barrier, stretch it out on a large flat surface.

2 – Using a stick, make sure all partitions are smoothed out to enable you to fold up the barrier tightly so that it can easily be inserted in its bag once rolled up.

3 – Before folding the barrier, keep all the joints open to make it easier to tie a second barrier to it, if need be.

4 – Start folding from the back so that the ballast weights will be positioned in the middle and under the barrier. Use the folds already appearing on the fabric as a reference.

Please note that the folding pattern and number of folds differ for each size of barrier.

<table>
<thead>
<tr>
<th>Model</th>
<th>Folding Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>WL-06 and WL-14</td>
<td>1 fold only</td>
</tr>
<tr>
<td>WL-20 and WL-26</td>
<td>2 folds</td>
</tr>
<tr>
<td>WL-39 Model</td>
<td>3 folds</td>
</tr>
</tbody>
</table>
Folding of the WP category  (model WP-2030 illustrated)

1 – After removing the ballast weights and properly cleaning and drying the barrier, stretch it out on a large flat surface.

2 – Using a stick, make sure all partitions are smoothed out to enable you to fold up the barrier tightly so that it can easily be inserted in its bag once rolled up.

3 – Before folding the barrier, keep all the joints open to make it easier to tie a second barrier to it, if need be.

4 – Start folding a first section of the barrier at the back. Use the folds already appearing on the fabric as a reference.

5 – Roll up on the side opposite to that of the instruction banner.

6 – After being properly rolled up, the barrier should look like this.
Please note that the folding pattern and number of folds differ for each size of barrier.

<table>
<thead>
<tr>
<th>WP-14 Model</th>
<th>WP-20 Model</th>
<th>WP-26 Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 fold at the back</td>
<td>2 folds at the back</td>
<td>2 folds at the back</td>
</tr>
<tr>
<td>2 folds at the front</td>
<td>2 folds at the front</td>
<td>2 folds at the front</td>
</tr>
<tr>
<td>Total width: 48 cm / 19”</td>
<td>Total width: 48 cm / 19”</td>
<td>Total width: 64 cm / 25”</td>
</tr>
</tbody>
</table>

5 – If required by the model, fold a second section of the barrier at the back. Folding ends at the barrier float.

6 – Next fold a first section of the front flap using the folds already appearing on the fabric as a reference.

7 – Finish folding the front fold by folding it over the back section as a whole.

8 – Roll up on the side opposite to that of the banner.

9 – After being properly rolled up, the barrier should look like this.
FOR FM GLOBAL INSTALLATIONS, THE FOLLOWING PRECAUTIONS WILL HELP ACHIEVE THE BEST FLOOD MITIGATION AND TO PREVENT OVERTOPPING.

Where there are waves, the Water-Gate barrier opens at the same speed that the waves are approaching the barrier. Regardless of the speed of the oncoming water, the barrier will open the way a parachute does in the wind, and therefore, overtopping can occur. To prevent the water going over the top of the barrier, the following things can be done:

1. There are small holes at the base and top of the partitions in which stiff rods or wooden dowels can be inserted to keep the barrier open at all times, preventing overtopping. The rods or dowels need to be installed before flood water begins to approach the barrier. We suggest that you use dowels that are 1 inch shorter than the required or preferred retention level.

2. During a flood situation, you might witness some water that goes over the top of the barrier, even with the rods or dowels installed. To solve this, you can use a piece of Styrofoam 1” h x 12” l x 3’ w to provide the top of the barrier with additional buoyancy to float on top of the water and prevent overtopping.

3. During our testing at the US Army Corp. of Engineer’s facility, sandbags were used at a rate of about 1 sandbag per foot to reduce the seepage rate of water beneath the barrier. Sandbags can also be helpful during hurricane or high wind situations to help maintain the barriers position. It was found that a larger number of sandbags per foot stacked at the corners greatly reduced the overall leakage.
To solve manhole backup problems, we developed a product called the Water-Plug. This product is very quick and easy to install. All you have to do is position it over the manhole. The cone shape of the Water-Plug enables it to deploy automatically even if the manhole has already started backing up.

Another advantage of using the Water-Plug from MegaSecur is that water from different infiltrations due to a flood can be diverted into the closest Water-Plug, as shown in the illustration below.

The water level in the Water-Plug will always be equal to the water level in the river.

Water that has infiltrated into basements can be pumped and redirected in the Water-Plug.

River overflowing with water

Storm drain

Pump

Flooded basement

Manhole

Water-Gate

Water level

The usage of wooden dowels, Styrofoam, and sandbags are required to meet the FM Approved installation due to the measured leakage rate during testing.
National Flood Barrier Testing & Certification Program

The Association of State Flood Plain Managers (ASFPM) in collaboration with FM Approvals and the US Army Corps of Engineers National Nonstructural/Flood Proofing Committee (NFPC) have implemented a National program of testing and certifying flood barrier products used for flood proofing and flood fighting. This program currently tests flood products in three categories, Temporary Flood Barriers, Closure Devices and Backwater Valves.

Our product is in the Temporary Barriers Category:
Temporary barriers are intended to provide temporary flood risk reduction. These barriers are generally setup just prior to a flood event and are generally taken down immediately after the flood threat has passed. Setup of these barriers does not require any permanent fixtures to which the barrier is attached. We obtained the Silver certification.

Our certified products are: WL-3930, WL-3950, WL-5030, WL-5050, WL-6030, WL-6050

Silver: Consists of water (at least one (1) foot hydrostatic test) and material testing, plant and product inspection and follow-up verification.

To meet FM Approved standard it took 8.6 man-hours to install a 84 foot long barrier in a U shape form.
Notes