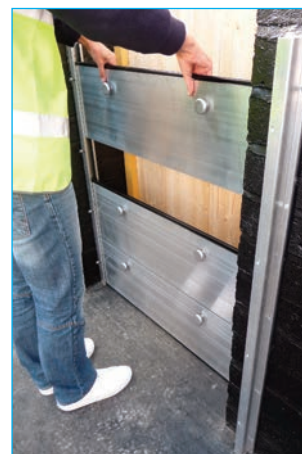


CARO[®]

Flood Defence Systems

WaterWall and WaterDoor

The Ultimate Flood Defence System





INTRODUCTION

The **CARO** name has become familiar to most specifiers and has established itself with the highest quality products and economic pricing.

The first of the **Caro Group of Companies, CAROSYSTEMS LIMITED**, commenced trading in 1985 and over the years has become trusted throughout the Building/ Construction industry.

Expansion over the next 30 years meant the Group grew to incorporate **CAROFLOW LIMITED**, which offers a comprehensive range of Roof & Floor Drainage Products as manufactured within the Group's in-house Die and Sand Casting Foundry, **MAYBREY RELIANCE**, which also caters for many commercial, aerospace, military and other casting requirements.

The latest addition to the Group in 2001, was **CARO FLOOD DEFENCE SYSTEMS** which was formed from expertise within the existing companies coupled with technical knowledge from an engineering background to develop the **WATERWALL** and **WATERDOOR** Flood Protection Systems.

The following pages detail the current range of products from **CARO FLOOD DEFENCE SYSTEMS**, showing component details, typical installations and case studies.

It cannot however, show all the bespoke products that have been produced over the years to suit certain customer specifications. **CARO** specialise in the design and manufacture of these bespoke products to accommodate specific requirements.

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WATER WALL



WHAT IS WATERWALL?

The **WaterWall** System has been developed as a quick and convenient method of “building” a water tight flood barrier that can be easily erected in the event of a flood and also dismantled and stored away when the danger has passed.

Suitable for installation to both residential and commercial property, **WaterWall** makes use of two permanently-fixed vertical channels fitted either side of the opening to be protected, along with pre-installed unobtrusive ground fixtures to allow the demountable post system to be put in place.

Aluminium panels are then dropped into position so that, when deployed, a barrier up to 1200mm high for any required span in excess of 1500mm wide is ready to protect your property.



HOW TO ERECT THE WATERWALL



1
When the barrier is not deployed, the opening remains unobstructed allowing full access as and when required.



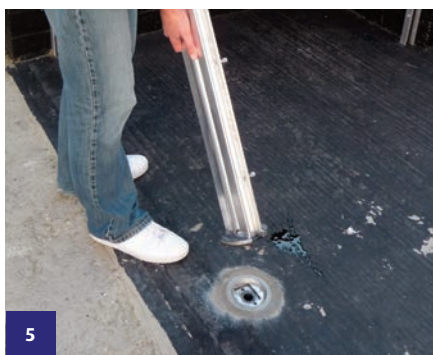
2
When the threat of flooding becomes apparent, commence the deployment process by unfastening ground insert dust caps with screwdriver or similar.



3
Once the caps have been loosened across the entire barrier length, lift the caps out to prepare each insert for deployment of demountable post.



4
Before inserting the demountable post, please ensure that the post and ground insert are free from any debris.



5
Insert demountable post into ground insert ensuring located correctly (note FRONT indicated) and finger tighten (only) the top securing nut.



6
Continue this process along the entire barrier length until all posts are deployed.

HOW TO ERECT THE WATERWALL



7
Begin inserting the first panel into the rails, ensuring that you start with the rubber sealing bottom panel first (these panels have seals on both top and bottom).



8
Continue the process of inserting all panels along the entire barrier length, ensuring all bottom panels are lowest, then middle panels, then top panels.



9
Complete the installation by inserting all panels, ensuring that all middle seals (between panels) are correctly seated and not misplaced.



10
Lightly secure demountable posts by using tool provided – DO NOT TIGHTEN AT THIS STAGE.



11
Insert compression block into fixed wall post and finger tighten.



12
Finger tighten the horizontal compression screws by hand, so that panels begin to depress against the rubber seal on the inside of the channels.



13
Finger tighten the vertical compression screws on the top locking block by hand, which will depress the rubber seal on the bottom aluminium panel to the floor.



14
Now fully tighten Demountable Post hexagon bolt using the T-Bar tool through it.



15
Equally tighten compression blocks in fixed wall posts...



16
...and compression screws at the top of the demountable posts.



17
The horizontal screws can now be tightened. DO NOT OVER TIGHTEN.



18
Finished.

WATERWALL COMPONENT PARTS



Demountable Post

The demountable post is required for **WaterWall** barriers that span in excess of 2000mm wide. The component is deployed into an unobtrusive Ground Insert, using the Course Thread connector.



Wall Rail Compression Blocks

The compression block is inserted into a recess in the fixed wall rails and is used to ensure adequate downward pressure is applied to each end of the barrier.

Ground insert & Post Cap

The 120mm diameter ground insert acts as a socket for **WaterWall** installations involving the requirement for a demountable post. When the barrier is not deployed a Post Cap seal is used to protect the ground insert.



Panel Sealing Screws

The panel sealing screws protrude through the fixed wall rails and demountable posts to secure the Aluminium panels against the rubber seals on the inside of the rails/posts to prevent any flood water ingress.



Ground Strips

The Ground Strip can be used to give added security/sealability to the system in areas of particularly rough or porous ground finishes. This can be supplied pre-fabricated/welded to the Fixed Wall Posts or loose.

Wall Rails

The permanently fixed wall rails are available in two forms, either "reveal fix" which means fixing in between the reveals/brickwork of the doorway or "face fix" which means fixing onto the face of the brickwork.



Panel Extrusion

Each individual panel is 300mm high x 20mm thick and is supplied with rubber seals to prevent water ingress.

PERFORMANCE

The **WaterWall** System exceeds the BSI British Standard PAS 1188-2014 on allowable leakage rates for demountable flood defence systems. Our data has been gathered by rigorous physical measurement within our own in-house testing facility.

Case Study 1 – Concession Building, Lincolnshire

Following a “high tide” incident previously, the East Lindsey District Council had to find the best and most convenient method of protecting their tenants in the large, on beach, Concession building on the sea front.

Both the **Caro WaterWall** and **WaterDoor** products fitted this need, allowing for full access, both out front as well as at the rear, during the busy season for the kiosks. If needed the barriers could be erected within minutes.

Once this busy season had finished it meant that the Concession holders were able to erect their barriers and leave them up through the winter, if they so desired, in the knowledge that they would not be affected should another flood event happen whilst they weren't there.

Client Name: East Lindsey District Council

Type of Project: Local Authority

Location: Skegness, Lincolnshire

Specification:

All barriers supplied 1.2m high

8 x **WaterDoor** Barriers – ranging from 1.2m to 1.83m wide

6 x **WaterWall** Barriers – ranging from 4.73m to 5.85m wide



Case Study 2 – Electric Utility Company, Middlesex

After much investigation and research, this well-known Electric Utility Company commissioned **CARO FDS** to design, supply and install a removable flood barrier to surround their sub-station equipment.

Being located right alongside a river that has been known to flood dramatically in the past, it was seen as a major weak point in their Disaster Planning to not have some method of protection. The **Caro WaterWall** system was chosen to give this protection.

Client Name: Major Electrical Utility Company

Type of Project: Commercial

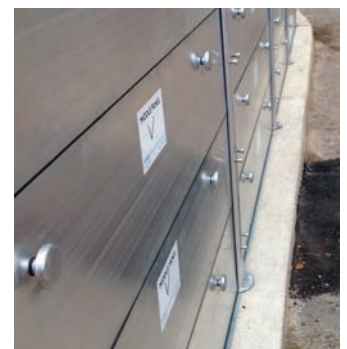
Location: Staines, Middlesex

Specification:

All barriers supplied 1.2m high

8 x **WaterDoor** Barriers – ranging from 1.2m to 1.83m wide

6 x **WaterWall** Barriers – ranging from 4.73m to 5.85m wide



WATER DOOR



The **WaterDoor** System is, in effect, the “baby brother” of the **WaterWall** and has been developed to provide the same quick and convenient method of “building” a water tight flood barrier, but is specifically designed for the smaller domestic residential and commercial doorways.

Like **WaterWall**, the **WaterDoor** System makes use of two permanently-fixed vertical channels fitted either side of the doorway. This then allows the Aluminium panels to be dropped into position so that when deployed, a barrier up to 1200mm high for any required span up to 1500mm wide is ready to protect your property.



WATERDOOR COMPONENT PARTS

Wall Rails

The permanently fixed wall rails are available in two forms, either “reveal fix” which means fixing in between the reveals/brickwork of the doorway or “face fix” which means fixing onto the face of the brickwork.



Panel Extrusion

Each individual panel is 300mm high x 20mm thick and is supplied with rubber seals to prevent water ingress.

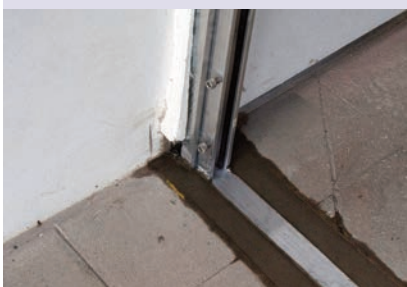


Wall Rail Compression Blocks

The compression block is inserted into a recess in the fixed wall rails and is used to ensure adequate downward pressure is applied to each end of the barrier.

Ground Strips

The Ground Strip can be used to give added security/sealability to the system in areas of particularly rough or porous ground finishes. This can be supplied pre-fabricated/welded to the Fixed Wall Posts or loose.



Panel Sealing Screws

The panel sealing screws protrude through the fixed wall rails and demountable posts to secure the Aluminium panels against the rubber seals on the inside of the rails/posts to prevent any flood water ingress.



Compression Post

The compression post is utilised for **WaterDoor** barriers that span over 1500mm, but less than 2000mm wide. This component ensures that adequate downward pressure is applied along the entire barrier length.



HOW TO ERECT THE WATERDOOR



1

When the barrier is not deployed, the opening remains unobstructed allowing full access to the property. When the threat of flooding becomes apparent, the deployment process can commence.



2

First remove the compression blocks at the top of the rails and unscrew the horizontal fixings, which are positioned down the length of the fixed wall rails. This is to ensure they do not obstruct the deployment of the panels.



3

Prior to slotting in the first Aluminium Panel, please ensure that the floor surface and its immediate surroundings are free from any debris. Once this is done, you can start inserting the panels.



4

Carefully insert each panel, ensuring that you start with the rubber sealing bottom panel first. These panels have seals on both top and bottom and are labelled BOTTOM PANEL.



5

Continue the panel deployment process with the insertion of the intermediary panels (these panels have top seals on only) and are labelled MIDDLE PANEL. Finally add the top panel which has no seal and is labelled TOP PANEL.



6

Insert compression block into fixed wall post and finger tighten. Finger tighten the horizontal compression screws by hand, so that panels begin to depress against the rubber seal on the inside of the channels, then finger tighten the vertical compression screws on the top compression blocks by hand, which will depress the rubber seal on the bottom aluminium panel to the floor.



7

Now equally tighten compression blocks in fixed wall posts.



8

The horizontal screws can now be tightened. DO NOT OVER TIGHTEN.



9

Finished.

The **WaterDoor** System exceeds the BSI British Standard PAS 1188–2014 on allowable leakage rates for demountable flood defence systems. Our data has been gathered by rigorous physical measurement within our own in-house testing facility.

WATERDOOR CASE STUDIES

Case Study 1 – Residential Flats, Cumbria



The Residents Committee of these private apartments in Cumbria, investigated a number of options when searching for a barrier that would protect them in the, extremely likely, event of another river breach.

As it was a case that all the flats affected were at ground level and that these flats wanted to continue to enjoy their easy access to the gardens and thereby the nearby river, they had to be assured that the system chosen would be removable and not detract from their enjoyment.

Caro WaterDoor and **WaterWall** fitted all these needs.

Using pre-fabricated assemblies, the barriers were able to be positioned and installed quickly and accurately.

Specification:

All barriers supplied 1.2m high
10 x **WaterDoor** Barriers – ranging from 0.88m to 1.95m wide
2 x **WaterWall** Barriers – ranging from 2.25m to 2.525m wide

Case Study 2 – Discount Supermarket Store, Hampshire



After being identified as having a 1 in 200 or greater annual probability of sea flooding, the appointed contractor for this scheme was given the task of sourcing flood barriers for a new store of a global discount supermarket chain on a Trading Estate in Hampshire.

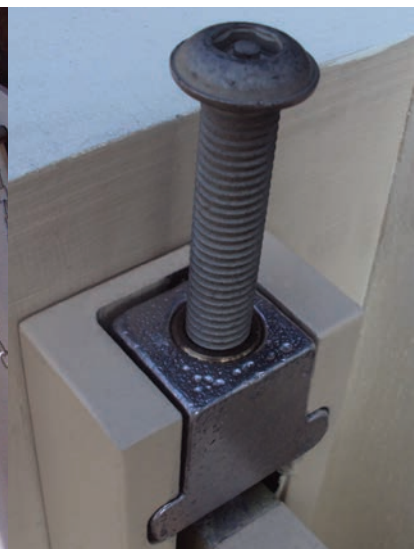
With the contractor requiring a “supply and fit” service, **CARO FDS** put them in touch with an Approved Installer, who carried out a survey and successfully secured an order for seven **CARO WaterDoor** and **WaterWall** barriers.

To make the reveal fix wall rails less obtrusive, when not required, they were powder coated in Black to match their surrounds.

Specification:

All barriers supplied 0.6m high
6 x **WaterDoor** Barriers ranging from 1.06m to 1.985m wide
1 x **WaterWall** Barrier, 2.53m wide

BESPOKE



With unrivalled technical expertise, **CARO FDS** has the ability to provide “bespoke” flood protection equipment should our standard **WaterWall** and **WaterDoor** systems not be suitable. Coupled with the support of our own UK based Foundry (Maybrey Reliance), **CARO FDS** can tailor individual requirements to provide the solution to almost any problem.

BESPOKE CASE STUDIES

Bespoke Case Study 1 – Royal Shakespeare Company



Caro Flood Defence Systems was one of a number of suppliers asked to offer their solution to the problem of protecting the 14th Century, Grade One Listed, actors accommodation cottages opposite the Globe Theatre, from the River Avon that runs alongside the theatre.

Due to the restrictions of the Listing, the use of our normal **WaterWall** and **WaterDoor** systems wasn't possible. So, using the **Caro Group** resources, a novel one piece barrier was designed. This barrier required the use of hidden wall and ground fixings and a specially commissioned rubber sealing system that was able to cope with the rough brick/mortar finishes that could not be altered in anyway.

Specification:

- 12 x completely bespoke flood barriers
- designed by **CARO FDS** following consultation with RSC
- manufactured by the **Caro Group's** in-house Foundry, Maybrey Reliance

Bespoke Case Study 2 – Commercial Unit, Kettering



Caro Flood Defence Systems once again demonstrated their skills in delivering flood protection equipment tailored to the exact specifications of their client. This commercial premises in Kettering required flood protection equipment that was in keeping with the uniform colour scheme of each unit across the entire industrial estate.

CARO FDS were able to supply **WaterWall** barriers powder coated to match the colours of the premises and also provide a lockable feature to protect the equipment from theft.

Specification:

- All barriers supplied 0.6m high
- 4 x **WaterWall** Barriers
- ranging from 3m to 4m wide
- powder coated to match premises colour scheme
- lockable to protect from theft

OPTIONAL EXTRAS AND ACCESSORIES

Whilst the standard components of the **WaterWall** and **WaterDoor** System provide everything you need to protect the openings of your property/premises from the threat of flooding, **CARO FDS** offer a number of optional extras and accessories to aid in the appearance and safe-keeping of your flood protection product. Details of these can be found below;



Powder Coating

To make the components as unobtrusive as possible, **CARO FDS** offer the facility to powder coat to any RAL colour not only the Wall Rails, but also the Aluminium Panels if desired.



Packers for Wall Rails

Packers are available for fixed wall rails to accommodate the positioning of existing door/patio door thresholds thereby allowing the barrier to stand proud of the opening.



Pre-Fabricated Barriers

CARO FDS are able to pre-manufacture, with all panels cut to size and Ground Strips welded in position, so that the installer is able to simply drill and plug walls, having prepared the ground for installation, and then screw and concrete into position.



Covers for Wall Rails

Manufactured in Aluminium, the Covers are designed to protect the Wall Rails and to hide the rails from view when the barrier is not in use. Covers can be powder coated to match the surroundings.



Security Fixings

All **CARO FDS** Flood Protection Equipment can be supplied with security fixings to enable the flood barrier to be left insitu without the concern of the equipment being stolen.

FREQUENTLY ASKED QUESTIONS

Q: What flood protection products are available from Caro FDS?

A: The **Caro WaterDoor** – for openings such as doorways, patio doors etc.

A: The **Caro WaterWall** – for wider openings such as driveways, garage doors, commercial units etc.

CARO FDS can also source additional products such as Airbrick Covers and Back-flow Valves etc on request.

Q: Are fitting instructions provided, should I wish to fit the products myself?

A: Yes, all **Caro** Barriers are supplied with clear, easy to understand, instructions should you wish to fit the **WaterDoor** or **WaterWall** yourself. However, we do recommend utilising our network of Approved Installers for added peace of mind.

Q: How long would it take to deliver my CARO Barrier?

A: Delivery times can vary depending on the product ordered and quantity required. Typically, most **Caro WaterDoors** are available within 2 working weeks and **WaterWalls** are available within 3 working weeks.

Q: Are you able to fit my CARO barrier for me?

A: **CARO FDS** have a network of Approved Installers who have years of experience fitting **Caro** Barriers. Please call on **01763 244446** or email **info@caro.co.uk** for details of your nearest installer.

Q: What are the height and width parameters of CARO WaterDoor and WaterWall?

A: Both the **Caro WaterDoor** and **WaterWall** are available in 300mm increment heights up to a maximum of 1200mm high. The maximum span we recommend for the **Caro WaterDoor** is 2000mm wide. However, there is no limit on the width for the **Caro WaterWall**.

Q: What if the CARO WaterDoor and WaterWall are not suitable for my needs?

A: If in the unlikely event the **Caro WaterDoor** and **WaterWall** are not suitable, **CARO FDS** do have the facility to design and produce bespoke equipment tailored to their client's exact specifications within its own in-house manufacturing facilities.

Q: Are your products Kitemarked?

A: Not at present but all **Caro** Barriers have been rigorously tested in-house and have been found to exceed the BSI British Standard PAS 1188:2014 on allowable leakage rates for Demountable and Building Aperture Flood Defence Systems.

Q: What guarantees do you offer?

A: All **Caro** barriers come with a 1-year guarantee on all components and seals. To keep the equipment in perfect working order, they should be stored in appropriate conditions ie. out of direct sunlight and subject to a periodic cleaning and maintenance regime. Replacement parts are available separately should they be required at any time.

Q: Do you carry out flood surveys?

A: Please call us on **01763 244446** or email us at **info@caro.co.uk** and we can put you in touch with one of our Approved Installers, who can offer a no obligation survey.

Q: Can you powder coat the equipment to make it less obtrusive?

A: **CARO FDS** can offer powder coated wall rails or post covers to match the **Caro** Barrier's surroundings. These can be coated in most RAL colours.

CARO[®]

Flood Defence Systems

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