

CI/SFB
187 (68.6)

June 2011

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 past 25 years has meant that the Group has grown to now 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

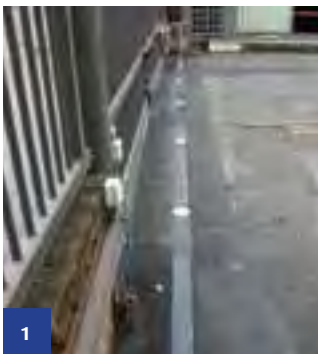


WHAT IS WATERWALL?

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 Patented Twist and Lock post system (Patent No. 2371068) 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.



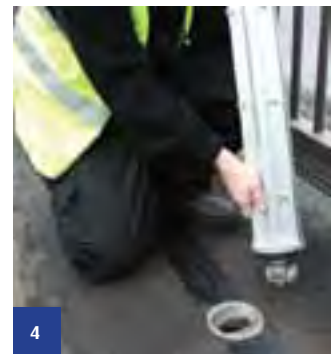
2

When the threat of flooding becomes apparent, commence the deployment process by unfastening ground insert dust caps with the 6mm allen key provided.



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 insert and its immediate surroundings are free from any debris.



5

Insert demountable post into ground insert.



6

Twist demountable post 90-degrees into position to accept Panel Extrusion. Note - there is no need to tighten them in place at this stage.



7

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

HOW TO ERECT THE WATERWALL



8

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).



9

Continue the process of inserting all bottom panels along the entire barrier length.



10

Commence inserting all intermediary panels (these panels have seals on top only)
Note – this step is not applicable to barriers under 600mm high.



11

Complete the installation by inserting all other panels until you arrive at the top panel (the only panels without rubber seals).



12

Tighten demountable posts by applying a 10mm socket wrench to the threaded bar located centrally in the top of each demountable post and then swivel the top locking block so that it is positioned over the top of the panels.



13

Partially tighten the horizontal compression screws either by hand or using the 6mm Allen key provided, so that panels begin to depress against the rubber seal on the inside of the channels.



14

Partially tighten the vertical compression screws on the top locking block by hand or using the 8mm Allen key provided, which will depress the rubber seal on the bottom aluminium panel to the floor.



15

Insert fixed end rail compression blocks and partially tighten by hand or using the 8mm Allen key.



16

The horizontal screws can now be fully tightened followed by the tightening of top locking and end rail compression blocks using the necessary Allen key.



WATERWALL COMPONENT PARTS



Demountable Post

The demountable post is required for WaterWall barriers that span in excess of 2500mm wide and above 600mm high. The component is deployed into a pre-installed, unobtrusive ground post using our Patented Twist and Lock system.



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.

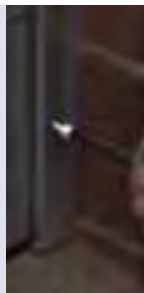
Ground Insert & Post Cap

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 lockable 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.



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.



Compression Post

The compression post is utilised for WaterWall barriers that span over 1500mm but less than 2500mm for heights up to 600mm. This component ensures that adequate downward pressure is applied along the entire barrier length.



Panel Extrusion

Each individual panel is 200mm high x 17mm thick and is supplied with rubber seals to prevent water ingress.

PERFORMANCE

The **WaterWall** System exceeds the BSI British Standard PAS 1188-2009 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 - Dover Port Authority, Kent



The Dover Port Authority contacted **CARO FDS** after persistent problems during the winter months, when heavy swell was coming over the sea wall and flooding into the Cruise Terminal.

WaterWall and WaterDoor proved the perfect combination of convenience, quality and cost effectiveness as a solution for preventing water ingress into the building.

Specification:

- All barriers supplied 0.4m high
- 2 x WaterDoor Barriers
 - ranging from 0.93m to 1.36m wide
- 9 x WaterWall Barriers
 - ranging from 1.6m to 11m wide

Case Study 2 - Council Estate, Oxfordshire



CARO FDS were delighted to be involved in a major Flood Protection scheme on a Housing Estate in Oxfordshire. The project for Oxford City Homes (part of Oxford City Council) required the need for a system that could be deployed at a moment's notice.

After a series of floods in the area, the most recent in 2007 which caused £250,000 worth of damage to a number of homes, **CARO FDS** supplied and installed 103 linear metres of WaterWall to protect the residents from further problems.

Specification:

- All barriers supplied 0.6m high
- 2 x WaterWall Barriers
 - ranging from 50m to 53m 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.



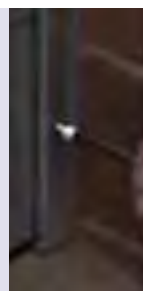
Panel Extrusion

Each individual panel is 200mm high x 17mm thick and is supplied with rubber seals to prevent water ingress.



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.



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.

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).



5
Continue the panel deployment process with the insertion of the intermediary panels (these panels have top seals on only). Note – this step is not applicable to barriers under 600mm high.



6
The final panel to be inserted will be the only one without rubber seals. When all panels are deployed, re-insert the Compression Blocks at the top of each Fixed Wall Rail ready for tightening.



7
Partially tighten the horizontal screws at this stage by hand or using the 6mm Allen key provided and follow the same process for the Compression Blocks – again by hand or using the 8mm Allen key provided.



8
Once this is done, by using the appropriate Allen key you can now fully tighten both the horizontal screws and the compression blocks in that order.



The **WaterDoor** System exceeds the BSI British Standard PAS 1188-2009 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

CARO FDS have supplied and installed a wide variety of **WaterDoor** Flood Defence Barriers ranging from the single domestic doorway to the multiple openings of a nursing home. Two examples can be found below, but you can view many of our other case studies by visiting our website at www.carofds.co.uk.

Case Study 1 - Residential Property, West Sussex



A resident in West Sussex had suffered the devastation of flooding to their property and as a result was forced to live in temporary accommodation whilst the renovation process took place.

As part of this process, **CARO FDS** manufactured and installed three WaterDoor barriers to help alleviate any further threats of flooding to the property.

Specification:

All barriers supplied 1.2m high
 3 x WaterDoor Barriers
 - ranging from 0.94m to 1.83m wide

Case Study 2 - Nursing Home, Oxfordshire



After suffering from persistent flood problems in recent years, a Nursing Home in a picturesque village in the Cotswolds saw **CARO FDS** as the ideal solution for protecting its Grade II listed building from the nearby river.

CARO FDS manufactured and installed no less than 15 flood barriers, which now gives its residents peace of mind when posed with the threat of rising waters.

Specification:

All barriers supplied 1m high
 13 x WaterDoor Barriers
 - ranging from 0.91m to 2m wide
 2 x WaterWall Barriers
 - ranging from 2.75m to 4.23m wide

B E S P O K E



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



Bespoke Case Study 2 – Commercial Unit, Kettering



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

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 0.4m 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.

Storage Boxes

CARO FDS have the facility to manufacture bespoke storage boxes in which to keep your flood protection equipment when not in use. The boxes can be produced in either Wood or Aluminium and can be lockable if necessary.



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.



Lockable Fixings

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

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

A: **WaterDoor** Barrier - for openings such as doorways, patio doors etc
A: **WaterWall** Barrier - 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?

A: Yes, all flood protection products are supplied with clear, easy to use instructions for installation. If at any stage you require any technical assistance, please call **01763 244446** or email us at **info@caro.co.uk**.

Q: How long would it take to deliver my flood barrier?

A: Delivery times can vary depending on the product ordered and quantity. Most **WaterDoor** orders are dispatched within 1-2 working weeks, **WaterWall** orders are dispatched within 2-3 working weeks and Bespoke System lead times are dependant on complexity and design of product.

Q: Do you provide a "Supply and Fit" service?

A: Yes, all of our flood protection products can be supplied and installed nationwide by **Caro FDS**. They are also available on a "Supply Only" basis if desired.

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

A: Both the **WaterDoor** and **WaterWall** are available in 200mm increment heights up to a maximum of 1200mm high. The maximum span we recommend for the **WaterDoor** is 1500mm wide, but the **WaterWall** has no limit on the width it can span.

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

A: If in the unlikely event the **WaterDoor** and **WaterWall** are not suitable, **Caro FDS**, with its in-house manufacturing facilities, technical expertise and the Caro Group's Foundry, can design and produce Bespoke Flood Protection Products tailored to the client's exact specifications. Go to page 12 or visit **www.carofds.co.uk** for examples of bespoke systems.

Q: Are your products Kite-marked?

A: No, not at present but they have been rigorously tested in-house and have been found to exceed the BSI British Standard PAS 1188-2009 on allowable leakage rates for Demountable and Building Aperture Flood Defence Systems.

Q: What guarantees do you offer?

A: All **Caro FDS** products come with a 1 year guarantee on all components and seals. All flood protection products should be stored in appropriate conditions ie. out of direct sunlight in order to avoid any deterioration of the seals. **Caro FDS** offer a maintenance service in which they can check and, if necessary, replace components and seals after the guarantee period has lapsed.

Q: Do you carry out flood surveys?

A: Yes, please call us on **01763 244446** or email us with details of your enquiry.



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The ultimate flood defence system

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