

01227 39 22 99
www.swarmwm.co.uk | info@swarmwm.co.uk

Swarm Aqua®

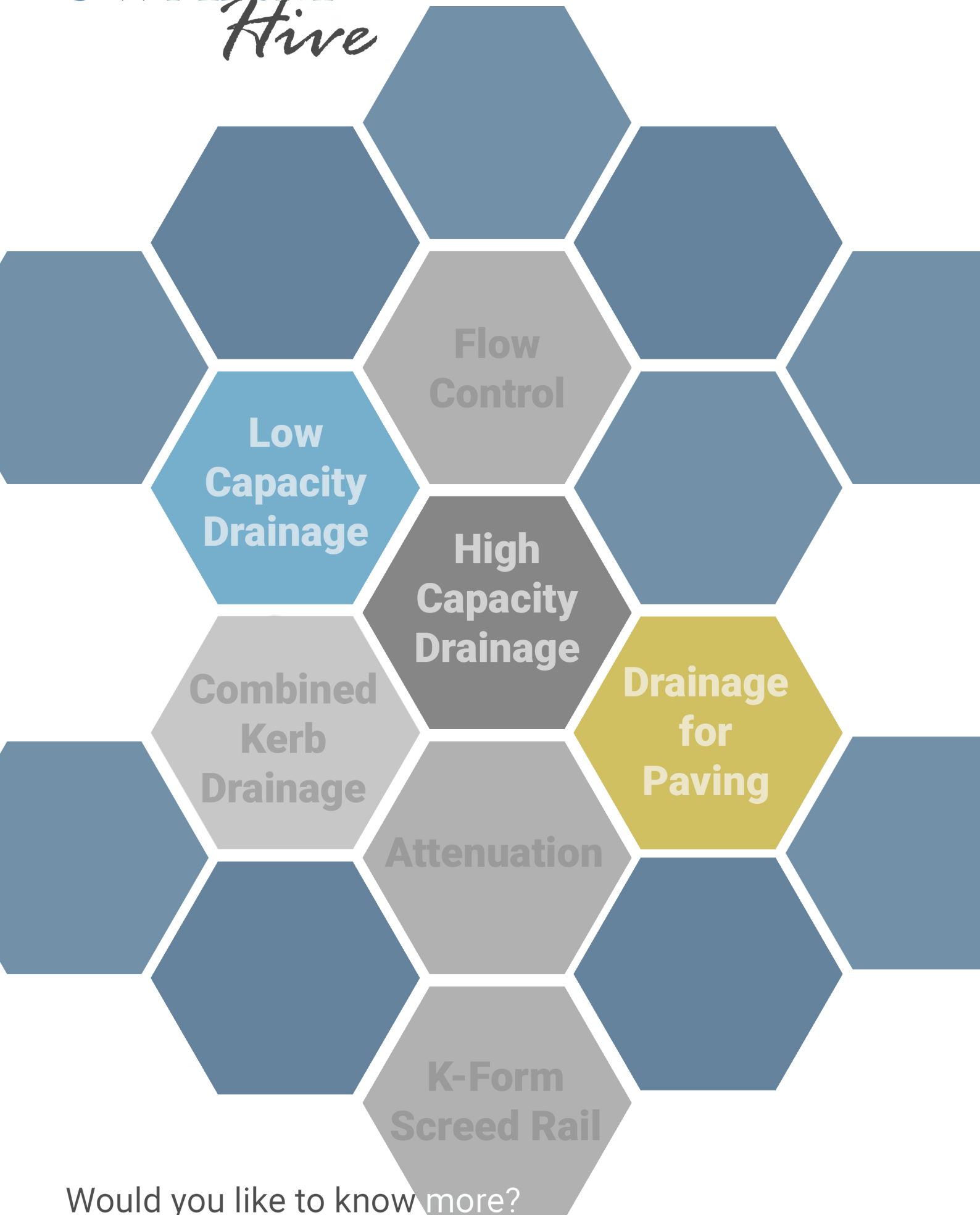
Linear Drainage System
Technical Information &
Specification Guide

SWARM
AQUA

Version	January 2020
---------	--------------

Copyright Swarm® 2020

SWARM *Hive*



Would you like to know more?

Contact our [technical support](#) team today

Index

Can't find what you're looking for? Please feel free to email us on info@swarmwm.co.uk or visit us online at www.swarmwm.co.uk

● Projects	Page 4
How we work with your projects	
● Swarm Aqua Systems	Page 5
Swarm Aqua® F900kN System Page 5	
Swarm Aqua® Product Tables Page 6	
Aqua Plus D400kN System Page 7	
Aqua for Paving D400kN System Page 9	
Connecting Channels & Accessories Page 11	
Combined Boxes Page 12	
Installation Examples Page 13	
Site Preparation Page 14	
Handling on site Page 15	
Recycling Information Page 16	
Case Studies Page 17	
● TORkerb Combined Kerb Drain	Page 18
Combined Kerb Drainage System	
● K-Form Screed Railing	Page 20
For shuttering & forming contraction joints	
● Our Partners	Page 21
Information on our partners & suppliers	
● Specification Guide	Page 22
Quick Access tables for specifications	

Swarm Aqua®

Swarm Aqua® is a linear drainage system designed for loadings up to F900kN with channels from 100-600mm wide.

Aqua Plus

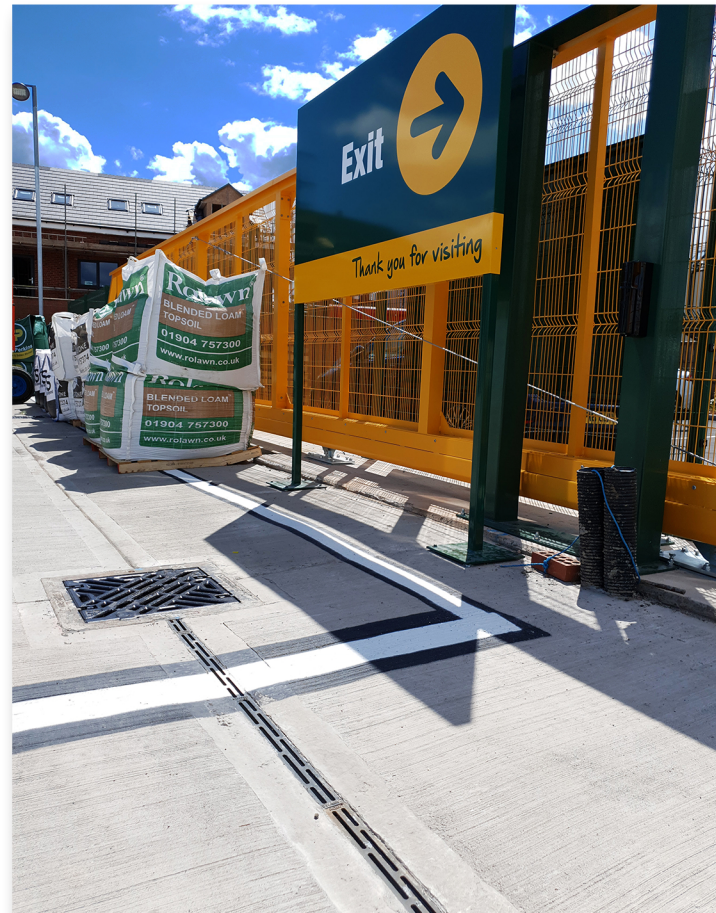
Aqua Plus is a linear drainage system designed for loadings up to D400kN with low capacity channels for smaller projects from 100-150mm wide. For example residential driveways, house builders & landscape projects.

Aqua for Paving

Aqua for Paving is a linear drainage system designed for paved areas with loadings up to D400kN, with channels from 100-600mm wide.

Visit our website for up to date technical information, drawing downloads, case studies and videos.

www.swarmwm.co.uk



Technical Drawing Service

If you require technical drawings for a specific application or are unable to find what you are looking for, please feel free to contact us via info@swarmwm.co.uk.

Our team will make sure that you are getting the most from the design of your project whilst not impacting on performance. We will also work alongside our partner companies and engineers included in the project where required to make sure that all parties are satisfied.

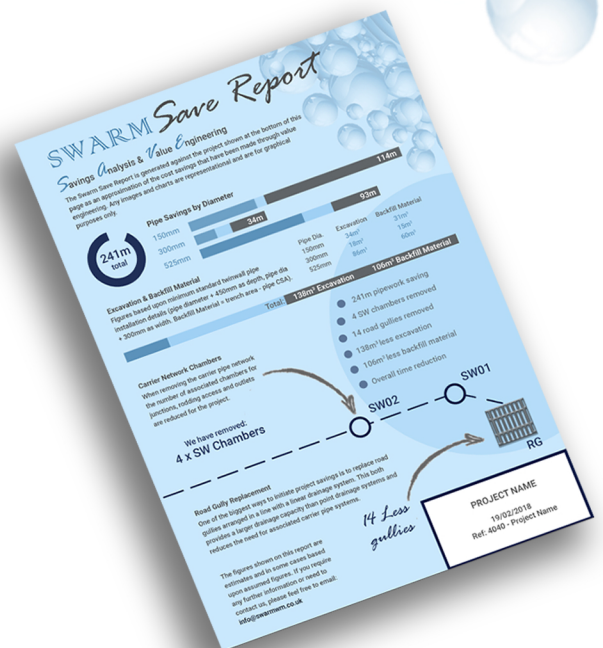
Your Project

For surface water drainage requirements, during the process of designing and value engineering your project we use industry standard formulae to ensure that our products are sized efficiently. By generating falls over a single sized channel or stepped fall configuration, we can ensure every channel is designed fit for purpose. Returned to you will be a complete design package for your project.

In some cases you may require bespoke items, one-off drawings or something that isn't available within our standard packages. By combining with leading industry manufacturers, we will offer a solution for most situations.

Swarm Save Reports

It may be determined that significant project savings can be made on a given project. The Swarm Save Report can be generated as a comparison between the old and recommended drainage layouts as an approximation of the cost savings that have been made through value engineering.



Swarm Hive

With more than 100 years of first hand industry experience, here at Swarm Water Management we have put together a hive of products that provides a wealth of benefits to the water management market. With this extensive knowledge we are able to share industry expertise and work alongside our customers to provide the optimal solution for projects within the drainage, civils, construction and attenuation sectors.

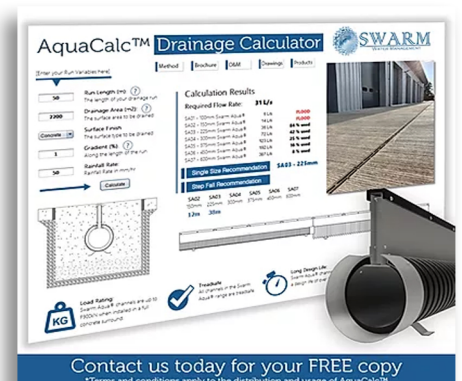
Coverage

Swarm and our partner companies are based throughout the whole of the UK.

AquaCalc® Drainage Calculator

The Swarm AquaCalc™ Drainage Calculator is a straightforward easy to navigate drainage calculator that puts you in control of your own project. AquaCalc™ can be used to size Swarm Aqua® channels for projects both big & small, providing results for single sized channels and also stepped fall configurations.

AquaCalc™, is totally free and independent for you to use when carrying out calculations for the Swarm Aqua® Linear Drainage system!



1 Ductile Iron Top

By making use of high grade ductile iron, the only section of Swarm Aqua® exposed to traffic and the elements is strong, durable and easily lost in its surroundings for a truly unobtrusive surface finish.

3 Steel Walls

Everything beneath the ductile iron top can be thought of as a concrete former. Steel walls provide excellent rigidity to keep the channel shape intact throughout the installation process.

5 Steel Spacers

To prevent pinching on the throat section when the channel is installed, spacers and the ductile iron top help keep the channel in shape. These spacers also act as locators to ensure a positive connection between channel units.

2 Heelsafe 10mm Openings

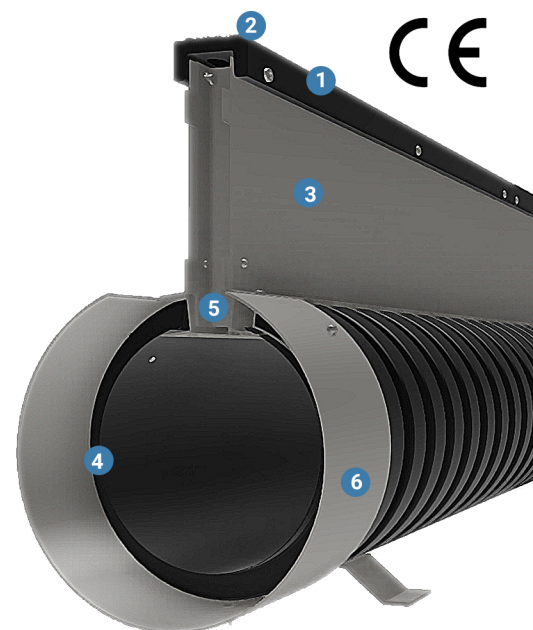
Swarm Aqua® is safe for use in areas of high pedestrian traffic as at the surface level only two 10mm openings are visible. Available for up to F900kN loading applications. A steel option is also available

4 Twinwall HDPE Channel

The plastic channel section of Swarm Aqua® is manufactured from 100% recycled materials and is resistant to a wide range of chemicals. Its design life is around 60 years.

6 Simple Installation

To keep things as simple as possible, you don't have to assemble Swarm Aqua® on site. It's as simple as push-fit connections and a full range of easy to use accessories. Factory-fitted collars ensure a snug fit every time.



Swarm Aqua® is a hybrid surface water drainage system that combines the benefits of proven materials and robust manufacturing techniques to create an exceptional surface water drainage product for external use. With a focus on strength, rigidity and lighter weight, Swarm Aqua® provides the perfect solution.

A strong, durable ductile iron top section designed specifically to take F900kN loadings, combined with steel side walls and Twinwall conduit ensures that the product is ideal for external drainage applications.

✓ Recycled & Recyclable

Swarm Aqua® is manufactured from both recyclable and recycled materials. A full case study detailing the environmental considerations of Swarm Aqua® channels is available online.

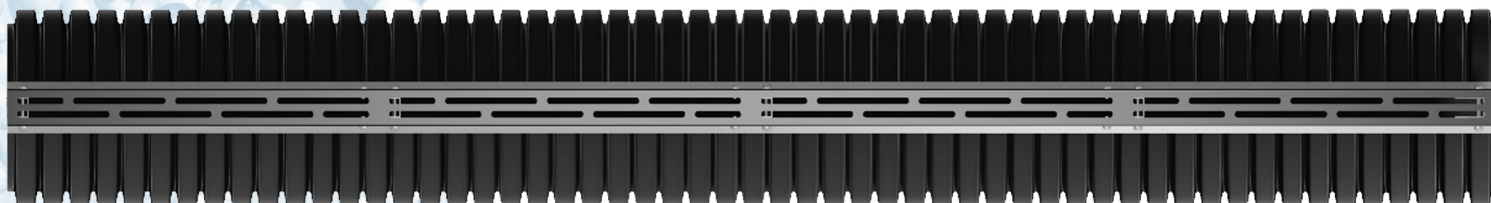
✓ Ideal in Heavy Loading Traffic Areas

The strong, durable design of Swarm Aqua® means that when installed with a full concrete surround, it can be used in areas of heavy loading traffic up to F900kN.

✓ Long Design Life

The twinwall channel is manufactured from 100% recyclable material (HDPE plastic) and is resistant to a range of chemicals, with a predicted design life of over 60 years.

UK PATENT NO: GB2566537



Other Swarm Aqua® Products

Aqua Plus

Aqua Plus is a linear drainage system designed for loadings up to D400kN with low capacity channels for smaller projects from 100-150mm wide. For example residential driveways, house builders & landscape projects.

Aqua for Paving

Aqua for Paving is a linear drainage system designed for paved areas with loadings up to D400kN, with channels from 100-600mm wide.

Code	Description	Product Information					Trench	
		Loading	Weight	Length	Height	Invert	Width	Depth
SA01	100mm Swarm Aqua	F900	24kg	2.0m	282mm	262mm	512mm	412mm
SA02	150mm Swarm Aqua	F900	25kg	2.0m	348mm	328mm	578mm	478mm
SA03	225mm Swarm Aqua	F900	28kg	2.0m	435mm	415mm	665mm	565mm
SA04	300mm Swarm Aqua	F900	31kg	2.0m	524mm	504mm	754mm	654mm
SA05	375mm Swarm Aqua	F900	37kg	2.0m	596mm	576mm	826mm	726mm
SA06	450mm Swarm Aqua	F900	41kg	2.0m	682mm	662mm	912mm	812mm
SA07	600mm Swarm Aqua	F900	56kg	2.0m	850mm	830mm	1080mm	980mm

Swarm Aqua® channels can be installed within many locations and detailed installation guidelines are available for each. Typical finishes are concrete, paving and asphalt. Drawings for each installation detail are available online at www.swarmwm.co.uk

2m Channel Units

To aid in handling, installation and delivery, Swarm Aqua® channels across all of the ranges are supplied in 2m units. When specified on drawings or within a schedule of parts, 2m units are supplied as standard.

Code	Description	Product Information								Trench Dimensions		
		Loading	Weight	Length	Width	Height	Invert	Opening		Width	Depth	Reinforcement
SA01	100mm Swarm Aqua	F900	24kg	2.0m	112mm	282mm	262mm	14490mm ²		512mm	412mm	Rqd for F900
SA02	150mm Swarm Aqua	F900	25kg	2.0m	178mm	348mm	328mm	14490mm ²		578mm	478mm	Rqd for F900
SA03	225mm Swarm Aqua	F900	28kg	2.0m	265mm	435mm	415mm	14490mm ²		665mm	565mm	Rqd for F900
SA04	300mm Swarm Aqua	F900	31kg	2.0m	354mm	524mm	504mm	14490mm ²		754mm	654mm	Rqd for F900
SA05	375mm Swarm Aqua	F900	37kg	2.0m	426mm	596mm	576mm	14490mm ²		826mm	726mm	Rqd for F900
SA06	450mm Swarm Aqua	F900	41kg	2.0m	512mm	682mm	662mm	14490mm ²		912mm	812mm	Rqd for E600
SA07	600mm Swarm Aqua	F900	56kg	2.0m	680mm	850mm	830mm	14490mm ²		1080mm	980mm	Rqd for D400

Reinforcement

In order to meet some loading criteria and especially on the largest sizes, Swarm Aqua® channels may require reinforcement within the concrete surround. The responsibility to design the reinforcement is that of the project engineer, however Swarm can provide independently generated structural guidelines for these scenarios. Please contact us for these installation guides.

Accessories

Swarm Aqua® channels are designed to be as simple as possible. That's why the accessories shown on this page can be used in all surface finishes, all load ratings and with both cast iron and steel tops.

Combined Access/Outlet Boxes

Universal access & outlet boxes to allow for both rodding access and outfall into external water systems.

Code	Description	Weight	Length	Width	Depth
SD01	Small Box	31kg	524mm	450mm	610mm
SD02	Large Box	48kg	605mm	675mm	750mm

End Caps

A simple steel plate to cap open ends where access units aren't required.

Code	Description	Weight	Length	Width	Depth
SB01	100mm End Cap	1kg	1.5mm	112mm	112mm
SB02	150mm End Cap	1kg	1.5mm	178mm	178mm
SB03	225mm End Cap	1kg	1.5mm	265mm	265mm
SB04	300mm End Cap	2kg	1.5mm	354mm	354mm
SB05	375mm End Cap	2kg	1.5mm	426mm	426mm
SB06	450mm End Cap	2kg	1.5mm	512mm	512mm
SB07	600mm End Cap	3kg	1.5mm	680mm	680mm

Transition Pieces

Used to connect one Swarm Aqua® Channel to the next when there is a change in size to achieve a graduated fall.

Code	Description	Weight	Length	Width	Depth
SC01	100/150	1kg	1.5mm	178mm	198mm
SC02	150/225	1kg	1.5mm	265mm	285mm
SC03	225/300	1kg	1.5mm	354mm	374mm
SC04	300/375	2kg	1.5mm	426mm	446mm
SC05	375/450	3kg	1.5mm	512mm	532mm
SC06	450/600	3kg	1.5mm	680mm	700mm

Male and Female Ends

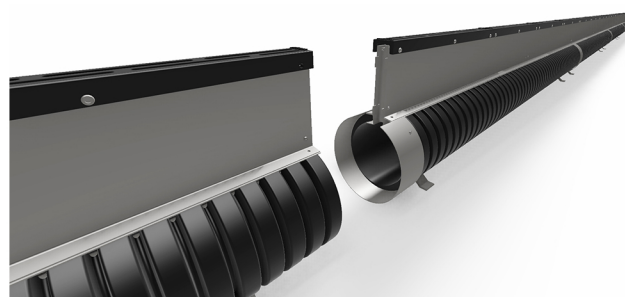
Swarm Aqua® channels are designed with a male and female end to make installation quick and as simple as possible. The integrated throat spacer and factory fitted collar provides a spigot for the channels to connect to each other ensuring a snug and straight fit.

Closing Channel Joints

Once the Swarm Aqua® channels have been placed in their final locations and it is ensured that any gaps are closed using the integrated connection system, we recommend checking all joints and connections to make sure the channels are in place and secure. Throughout the installation process, please make sure that channels are protected as the load rating of the system is achieved once installation is complete.

Maintenance

Swarm Aqua® channels can be rodded from the combined boxes, however general maintenance can be achieved by jetting from one end or through the slots in the surface finish as required. The maximum jetting pressure that can be safely applied to the Twinwall pipe section of Swarm Aqua® channels is 180 Bar or 2500 PSI.



1 Ductile Iron Top

By making use of high grade ductile iron, the only section of Aqua Plus exposed to traffic and the elements is strong, durable and easily lost in its surroundings for a truly unobtrusive surface finish.

3 Steel Walls

Everything beneath the ductile iron top can be thought of as a concrete former. Steel walls provide excellent rigidity to keep the channel shape intact throughout the installation process.

5 Spacers

To prevent pinching on the throat section when the channel is installed, spacers and the ductile iron top help keep the channel in shape. These spacers also act as locators to ensure a positive connection between channel units.

2 Heelsafe 10mm Openings

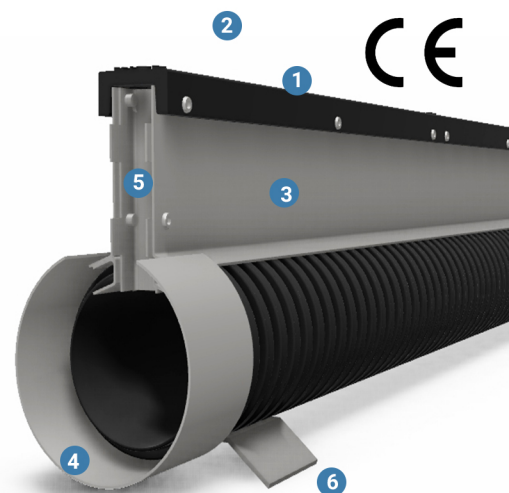
Aqua Plus is safe for use in areas of high pedestrian traffic as at the surface level only two 10mm openings are visible. Available for up to D400kN loading applications.

4 Twinwall HDPE Channel

The plastic channel section of Aqua Plus is manufactured from 100% recycled materials and is resistant to a wide range of chemicals. Its design life is around 60 years.

6 Simple Installation

To keep things as simple as possible, you don't have to assemble Swarm Aqua on site. It's as simple as push-fit connections and a full range of easy to use accessories. Factory-fitted collars ensure a snug fit every time.



Aqua Plus is available in two sizes, 100mm and 150mm though both look the same once installed. Most driveways and smaller areas only require 100mm channels, though as Aqua Plus is rated to D400kN it can be used in a wider range of applications.

Aqua Plus uses the same materials and manufacturing techniques as its parent range, Swarm Aqua®. Designed for use in areas that require a robust surface finish and a low flow rate, Aqua Plus is the perfect solution for longevity on block paved, concrete or asphalt driveways. No removable tops and a solid iron top make Aqua Plus a D400kN rated product.

✓ Recycled & Recyclable

Aqua Plus is manufactured from both recyclable and recycled materials. A full case study detailing the environmental considerations of Swarm Aqua® channels is available online.

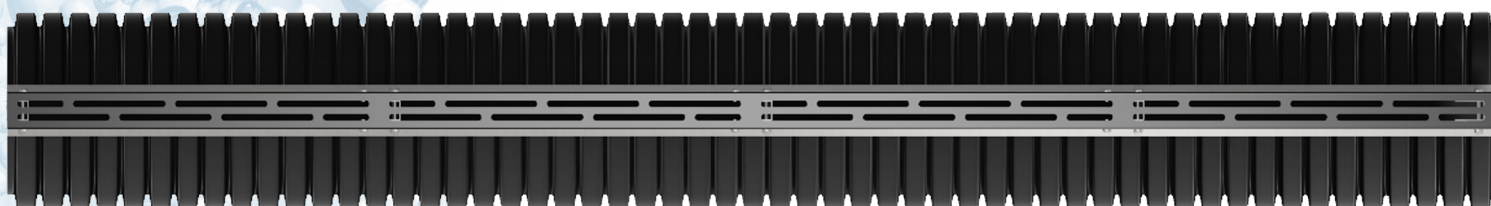
✓ Ideal in High Traffic Areas

The strong, durable design of Aqua Plus means that when installed with a full concrete surround, it can be used in areas of heavy loading traffic up to D400kN.

✓ Long Design Life

The twinwall channel is manufactured from 100% recyclable material (HDPE plastic) and is resistant to a range of chemicals, with a predicted design life of over 60 years.

UK PATENT NO: GB2566537



Code	Description	Product Information					Trench	
		Loading	Weight	Length	Height	Invert	Width	Depth
AP01	100mm Aqua Plus	D400	20kg	2.0m	232mm	212mm	412mm	412mm
AP02	150mm Aqua Plus	D400	21kg	2.0m	298mm	278mm	478mm	478mm

Other Swarm Aqua® Products

Aqua F900kN

Swarm Aqua® is a linear drainage system designed for heavy duty applications with loadings up to F900kN with channels from 100-600mm wide.

Aqua for Paving

Aqua for Paving is a linear drainage system designed for paved areas with loadings up to D400kN, with channels from 100-600mm wide.

Aqua Plus can be installed within many locations and detailed installation guidelines are available for each. Typical finishes are concrete, paving and asphalt. drawings for each installation detail are available online at www.swarmwm.co.uk

2m Channel Units

To aid in handling, installation and delivery, Aqua Plus channels are supplied in 2m units. When specified on drawings or within a schedule of parts, 2m units are supplied as standard.

Code	Description	Product Information								Trench Dimensions		
		Loading	Weight	Length	Width	Height	Invert	Opening		Width	Depth	Reinforcement
AP01	100mm Aqua Plus	D400	20kg	2.0m	110mm	232mm	212mm	14490mm ²		412mm	412mm	Not reqd
AP02	150mm Aqua Plus	D400	21kg	2.0m	178mm	298mm	278mm	14490mm ²		478mm	478mm	Not reqd

Accessories

Aqua Plus channels are designed to be as simple as possible. That's why the accessories shown on this page can be used in all surface finishes, all load ratings and with both cast iron and steel tops. Please note that transition pieces, end caps and chamber connectors are universal through all Swarm Aqua® products, including Aqua Plus and Aqua for Paving.

Aqua Plus Combined Boxes

Universal access & outlet boxes to allow for both rodding access and outfall into external water systems.

Code	Description	Weight	Length	Width	Depth
AD01	Aqua Plus Box	21kg	245mm	245mm	350mm

End Caps

A simple steel plate to cap open ends where access units aren't required.

Code	Description	Weight	Length	Width	Depth
SB01	100mm End Cap	1kg	1.5mm	112mm	112mm
SB02	150mm End Cap	1kg	1.5mm	178mm	178mm

Transition Pieces

Used to connect one Swarm Aqua Channel to the next when there is a change in size.

Code	Description	Weight	Length	Width	Depth
SC01	100/150	1kg	1.5mm	178mm	198mm

Male and Female Ends

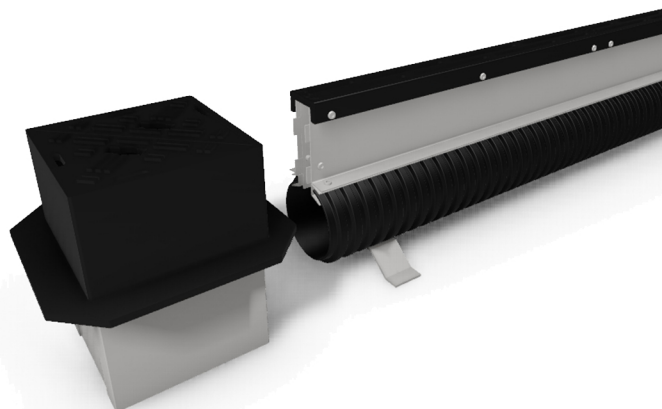
Aqua Plus channels are designed with a male and female end to make installation quick and as simple as possible. The integrated throat spacer provides a spigot for the channels to connect to each other ensuring a snug and straight fit.

Closing Channel Joints

Once the Aqua Plus channels have been placed in their final locations and it is ensured that any gaps are closed using the integrated connection system, we recommend checking all joints and connections to make sure the channels are in place and secure. Throughout the installation process, please make sure that channels are protected as the load rating of the system is achieved once installation is complete.

Maintenance

Aqua Plus channels can be rodded from the combined boxes, however general maintenance can be achieved by jetting from one end or through the slots in the surface finish as required. The maximum jetting pressure that can be safely applied to the Twinwall pipe section of Aqua Plus channels is 180 Bar or 2500 PSI.



1 Crimped Steel Top

The only section of Aqua for Paving exposed to the elements is strong, durable and easily lost in its surroundings for a truly unobtrusive surface finish. Manufactured from 2mm galvanised steel it is both heel safe and long lived.

2 Heelsafe 8.5mm Openings

Aqua for Paving is safe for use in areas of high pedestrian traffic as at the surface level only a single 8.5mm opening is visible between your blocks.

3 Steel Walls

Everything beneath the surface level can be thought of as a concrete former. Steel walls provide excellent rigidity to keep the channel shape intact throughout the installation process.

4 Twinwall HDPE Channel

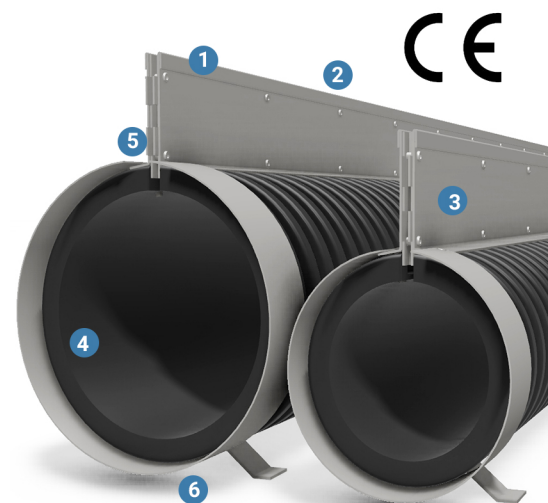
The plastic channel section of Aqua for Paving is manufactured from 100% recycled materials and is resistant to a wide range of chemicals. Its design life is around 60 years.

5 Spacers

To prevent pinching on the throat section when the channel is installed, spacers and the crimped top help keep the channel in shape. These spacers also act as locators to ensure a positive connection between channel units.

6 Simple Installation

To keep things as simple as possible, you don't have to assemble Swarm Aqua on site. It's as simple as push-fit connections and a full range of easy to use accessories. Factory-fitted collars ensure a snug fit every time.



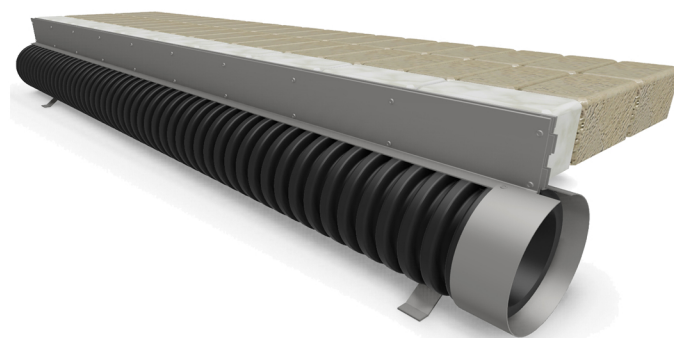
UK PATENT NO: GB2566537

Interchangability

If you are specifying either Swarm Aqua® or Aqua for Paving, you can interchange between the ranges as they are available in all the same sizes. Even the accessories work for both. Please remember that Aqua for Paving is rated to D400kN, whereas Swarm Aqua® can be rated for up to F900kN applications.

We are also able to manufacture Aqua for Paving in stainless steel for special requirements.

If in doubt, ask our technical team and we will be able to help you.



✓ Recycled & Recyclable

Aqua for Paving is manufactured from both recyclable and recycled materials. A full case study detailing the environmental considerations of Swarm Aqua® channels is available online.

✓ Ideal in Paved & Landscaped Areas

The crimped top section of Aqua for Paving means that when installed in a paved or landscaped area, a truly unobtrusive finish is achieved.

✓ Long Design Life

The twinwall channel is manufactured from 100% recyclable material (HDPE plastic) and is resistant to a range of chemicals, with a predicted design life of over 60 years.

Other Swarm Aqua® Products

Aqua Plus

Aqua Plus is a linear drainage system designed for loadings up to D400kN with low capacity channels for smaller projects from 100-150mm wide. For example residential driveways, house builders & landscape projects.

Aqua F900kN

Swarm Aqua® is a linear drainage system designed for heavy duty applications with loadings up to F900kN with channels from 100-600mm wide.

Code	Description	Product Information					Trench	
		Loading	Weight	Length	Height	Invert	Width	Depth
PA01	100mm Aqua for Paving	D400	14kg	2.0m	232mm	212mm	412mm	382mm
PA02	150mm Aqua for Paving	D400	15kg	2.0m	298mm	278mm	478mm	448mm
PA03	225mm Aqua for Paving	D400	18kg	2.0m	385mm	365mm	565mm	535mm
PA04	300mm Aqua for Paving	D400	21kg	2.0m	474mm	454mm	654mm	624mm
PA05	375mm Aqua for Paving	D400	27kg	2.0m	546mm	526mm	726mm	696mm
PA06	450mm Aqua for Paving	D400	31kg	2.0m	632mm	612mm	812mm	782mm
PA07	600mm Aqua for Paving	D400	46kg	2.0m	800mm	780mm	980mm	950mm

Aqua for Paving can be installed within many locations and detailed installation guidelines are available for each. Typical finishes are concrete, paving and asphalt. Drawings for each installation detail are available online at www.swarmwm.co.uk

2m Channel Units

To aid in handling, installation and delivery, Aqua for Paving channels are supplied in 2m units. When specified on drawings or within a schedule of parts, 2m units are supplied as standard.

Code	Description	Product Information								Trench Dimensions		
		Loading	Weight	Length	Width	Height	Invert	Opening		Width	Depth	Reinforcement
PA01	100mm Swarm Aqua	D400	14kg	2.0m	112mm	232mm	212mm	8500mm ²		412mm	382mm	Not Required
PA02	150mm Swarm Aqua	D400	15kg	2.0m	178mm	298mm	278mm	8500mm ²		478mm	448mm	Not Required
PA03	225mm Swarm Aqua	D400	18kg	2.0m	265mm	385mm	365mm	8500mm ²		565mm	535mm	Not Required
PA04	300mm Swarm Aqua	D400	21kg	2.0m	354mm	474mm	454mm	8500mm ²		654mm	624mm	Not Required
PA05	375mm Swarm Aqua	D400	27kg	2.0m	426mm	524mm	526mm	8500mm ²		726mm	696mm	Not Required
PA06	450mm Swarm Aqua	D400	31kg	2.0m	512mm	632mm	612mm	8500mm ²		812mm	782mm	Not Required
PA07	600mm Swarm Aqua	D400	46kg	2.0m	680mm	800mm	780mm	8500mm ²		980mm	950mm	Rqd for D400

Reinforcement

In order to meet some loading criteria, Aqua for Paving channels may require reinforcement within the concrete surround. The responsibility to design the reinforcement is that of the project engineer, however Swarm can provide independently generated structural guidelines for these scenarios.

Accessories

Aqua for Paving channels are designed to be as simple as possible. That's why end caps, combined boxes, transition pieces and chamber connectors are universal and can be used across all of the Swarm Aqua® ranges.

Combined Access/Outlet Boxes

Universal access & outlet boxes to allow for both rodding access and outfall into external water systems. A Slimline box can be used for up to 225mm Channels, and is supplied with a recessed cover and frame.

Code	Description	Weight	Length	Width	Depth
PD01S	Slimline Box	30kg	503mm	250mm	500mm
PD01	Small Box	31kg	524mm	450mm	610mm
PD02	Large Box	48kg	605mm	675mm	750mm

End Caps

A simple steel plate to cap open ends where access units aren't required.

Code	Description	Weight	Length	Width	Depth
SB01	100mm End Cap	1kg	1.5mm	112mm	112mm
SB02	150mm End Cap	1kg	1.5mm	178mm	178mm
SB03	225mm End Cap	1kg	1.5mm	265mm	265mm
SB04	300mm End Cap	2kg	1.5mm	354mm	354mm
SB05	375mm End Cap	2kg	1.5mm	426mm	426mm
SB06	450mm End Cap	2kg	1.5mm	512mm	512mm
SB07	600mm End Cap	3kg	1.5mm	680mm	680mm

Transition Pieces

Used to connect one Swarm Aqua® Channel to the next when there is a change in size to achieve a graduated fall.

Code	Description	Weight	Length	Width	Depth
SC01	100/150	1kg	1.5mm	178mm	198mm
SC02	150/225	1kg	1.5mm	265mm	285mm
SC03	225/300	1kg	1.5mm	354mm	374mm
SC04	300/375	2kg	1.5mm	426mm	446mm
SC05	375/450	3kg	1.5mm	512mm	532mm
SC06	450/600	3kg	1.5mm	680mm	700mm

Male and Female Ends

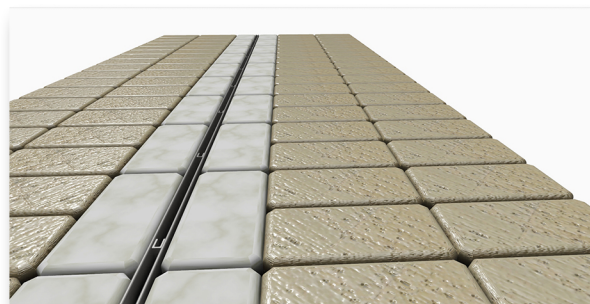
Aqua for Paving channels are designed with a male and female end to make installation quick and as simple as possible. The integrated throat spacer provides a spigot for the channels to connect to each other ensuring a snug and straight fit.

Closing Channel Joints

Once the Aqua for Paving channels have been placed in their final locations and it is ensured that any gaps are closed using the integrated connection system, we recommend checking all joints and connections to make sure the channels are in place and secure. Throughout the installation process, please make sure that channels are protected as the load rating of the system is achieved once installation is complete.

Maintenance

Aqua for Paving channels can be rodded from the combined boxes, however general maintenance can be achieved by jetting from one end or through the slots in the surface finish as required. The maximum jetting pressure that can be safely applied to the Twinwall pipe section of Swarm Aqua channels is 180 Bar or 2500 PSI.



Male and Female Ends

Swarm Aqua® channels are designed with a male and female end to make installation quick and as simple as possible. The integrated throat spacer provides a spigot for the channels to connect to each other ensuring a snug and straight fit.



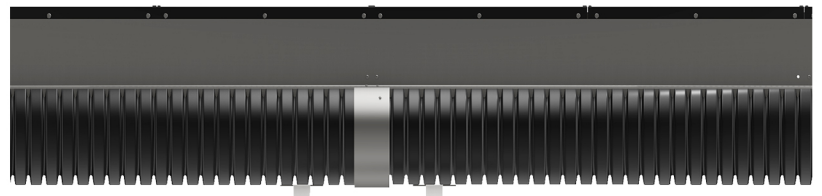
Connecting Accessories

All of the accessories available with Swarm Aqua® systems use a similar method of jointing. Metal tabs are used to keep the channel located in place and it is recommended that the accessory is held in place securely to prevent ingress of concrete during installation.



Closing Channel Joints

Once the Swarm Aqua® channels have been placed in their final locations and it is ensured that any gaps are closed using the integrated connection system, we recommend checking all joints and connections to make sure the channels and accessories are in place and secure. Throughout the installation process, please make sure that channels are protected as the load rating of the system is achieved once installation is complete.



Integrated Throat Spacer

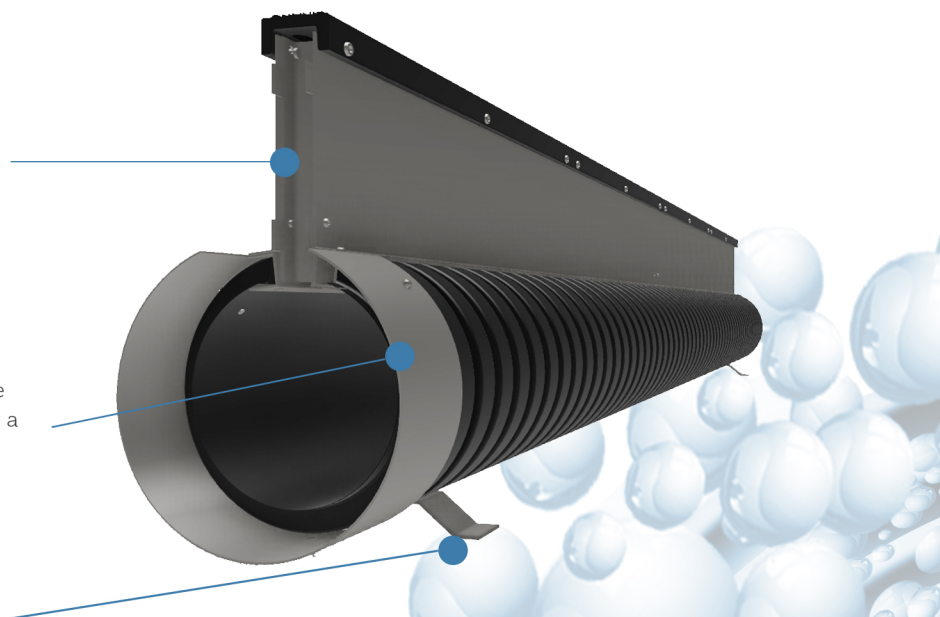
The throat spacer protrudes from the steel throat to locate one Swarm Aqua® channel to the next. As the location is inside the channel walls this avoids any interference with the concrete near the surface of the trench.

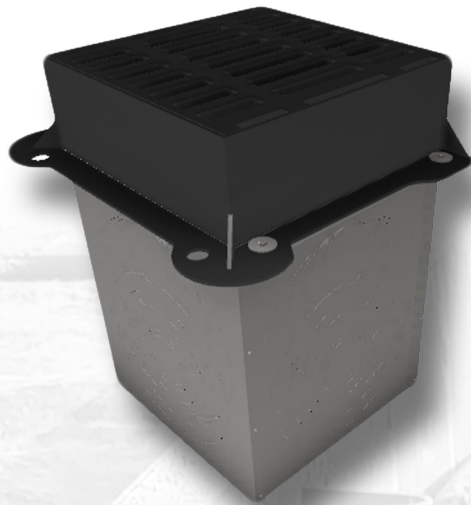
Positive Collar Connection

An integrated steel collar provides connection of the channel conduit from one unit to the next, ensuring a straight, neat finish every time.

Stabilising Channel Feet

The steel feet are provided to stabilise the Swarm Aqua® channels during installation.





Combined Access/Outlet Units

Swarm Aqua® is a complete solution for most cases, as such Combined Access/Outlet Units are available to provide both an access solution for maintenance and an outlet for discharge into local waste water systems.

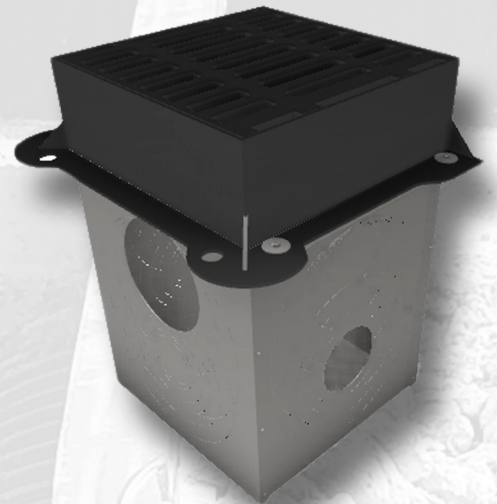
Combined boxes are available for channels up to 300mm (small) and for channels up to 450mm (large).

The grating and frames supplied are load rated for up to D400kN and are 150mm. If access or outlet units are required for 600mm channel, a chamber must be formed on site. Should F900kN Covers be required these must be sourced as required.

Using Swarm Aqua® Access/Outlet Units

Swarm Aqua® combined boxes have been pre-perforated with the appropriate sizes for channel connections with Swarm Aqua® Chamber Connectors or standard twinwall pipe fittings. The 'knockouts' are removable by cutting through the 1.5mm steel tabs that hold them in place, following required site safety guidelines.

Outlet knockouts are also pre-cut on all four sides of the combined access/outlet boxes for connection to local waste water systems. These all provide an invert lower than the invert of Swarm Aqua® channels to ensure water is efficiently removed from the system. Please note that it is not possible to outlet from the same side as a Swarm Aqua® Channel is connected.



Swarm Aqua® Chamber Connectors

When using either a Swarm Aqua® combined access/outlet box or a chamber formed on site, a Swarm Aqua® Chamber Connector is used. This is a standard Twinwall pipe fitting and it is normal to use offcuts on site in lieu of this piece. It is important to create at least a 200mm gap between the end of the channel and the chamber itself to ensure that the cover and frame receive an adequate concrete surround to ensure the appropriate load rating is achieved.



Full concrete surround

When installed within a full concrete surround, Swarm Aqua® channels are capable of achieving load ratings of up to F900kN. The details provided are a guideline and must be signed-off by the project specific engineer. Concrete reinforcement may be necessary to achieve F900kN loadings. Reinforcement details are the responsibility of the project engineer.

For full and up to date drawings in both DWG and PDF formats please feel free to contact us on info@swarmwm.co.uk or visit www.swarmwm.co.uk



Asphalt surface finish

When installed with an asphalt surface finish, Swarm Aqua® channels are capable of achieving load ratings of up to D400kN and as with all installation details, they are provided as a guideline and must be signed-off by the project specific engineer.

For full and up to date drawings in both DWG and PDF formats please feel free to contact us on info@swarmwm.co.uk or visit www.swarmwm.co.uk



Block paving surface finish

When installed with a block paving surface finish, Swarm Aqua® channels are capable of achieving load ratings of up to D400kN. The blocks closest the channel line should be affixed with a polymer modified mortar to prevent excessive movement. Both open sand jointed, and cement jointed paving installation methods can be used, and loading depending on each type should be specified by the project engineer.

For full and up to date drawings in both DWG and PDF formats please feel free to contact us on info@swarmwm.co.uk or visit www.swarmwm.co.uk



Swarm Aqua® channels are designed to be installed within a concrete surround and completed at surface level with a range of finishes, be it pavement quality concrete, asphalt, block paving or landscaping. Swarm recommends using a two-pour installation method within a pre-formed trench to ensure the final load rating of the channel is in line with project specifications. When installed in concrete, Swarm Aqua® channels can cater for loadings of up to F900kN. For block paving and asphalt installations, Swarm Aqua® is rated for up to D400 loading as it is not recommended to surpass this loading due to the nature of the malleable or movable surface.



Reinforcement

Swarm Water Management have engaged Clegg Associates to perform an independent design and loading check on Swarm Aqua® when it is installed in concrete, asphalt and Block Paving. Their recommendations for reinforcement can be requested from us and are represented by an installation drawing showing a reinforcement mesh where required for the relevant loadings. See Page 6 for more information on where reinforcement may be required.

Handling & Storage

Swarm Aqua® channels can be heavy, as such it is important to observe all relevant site health and safety guidelines and regulations and use mechanical lifting methods where necessary. The channels themselves should be kept in their original packaging and stored in a location that will prevent damage on site.

Once installed in the ground if it is necessary for site equipment to traverse the trench, a protective bridge should be formed to protect the Swarm Aqua channel from unnecessary damage. It is important that Swarm Aqua® is never trafficked prior to the final stage of it's installation, as the strength of the drainage channel is dependent on it's concrete surround and any unnecessary loading will cause deformation and may affect the quality or length of the channel's lifespan.

Trench Preparation

Swarm Aqua® channels are designed to be installed within a preformed trench before being set within concrete using a two-pour method. It is important to follow the instructions laid out within our recommended installation drawings SA-S-001 (Full Concrete Surround), SA-S-002 (Asphalt Surface Finish) & SA-S-003 (Paved Surface Finish) to achieve the required load rating for the project. The trench is required to be 150mm deeper than the base of the channel section and 200mm wide from either side of the channel to ensure the concrete can flow underneath the channel and provide suitable wall thickness.

Trench Details

Channel	Width (mm)	Height (mm)
Swarm Aqua® 100mm Channel - 2m	512	412
Swarm Aqua® 150mm Channel - 2m	578	478
Swarm Aqua® 225mm Channel - 2m	665	565
Swarm Aqua® 300mm Channel - 2m	754	654
Swarm Aqua® 350mm Channel - 2m	826	726
Swarm Aqua® 475mm Channel - 2m	912	812
Swarm Aqua® 600mm Channel - 2m	1080	980



Handling Swarm Aqua Channels

Swarm Aqua® channels are generally 2m long and can be heavy, as such it is important to observe all relevant site health and safety guidelines and regulations and use mechanical lifting methods where necessary. Lifting straps should not be attached through the throat spacers or around the feet, they should be wrapped around the channel, between ribs where able to do so.

Swarm Aqua® accessories can be handled manually, however as they are primarily of cut steel construction it is important to take care that any burrs and sharp edges are avoided, and PPE considerations are made.



Delivery to Site

In most cases Swarm Aqua® channels are delivered to your site packaged in bundles as shown in the image to the right. The channels will be tessellated to protect them from movement during haulage, however care should be taken when separating the bundle on site to ensure components or units are not damaged in any way during this process. Accessories will be either bundled together with the channel or delivered in their own crate and should be easily separated. Delivery to site will be made on articulated flat bed lorries without hi-ab or off-loading facilities, so it is important that site off-loading facilities are provided on site.

Channel Weights

Channel	Weight (kg)
Swarm Aqua® 100mm Channel - 2m	24
Swarm Aqua® 150mm Channel - 2m	25
Swarm Aqua® 225mm Channel - 2m	28
Swarm Aqua® 300mm Channel - 2m	31
Swarm Aqua® 350mm Channel - 2m	37
Swarm Aqua® 475mm Channel - 2m	41
Swarm Aqua® 600mm Channel - 2m	56

These weights are approximate



PPE

Swarm Aqua® has laser cut steel parts and as such some parts of the channel and accessories may have sharp edges or burrs. Although every effort is taken to minimize these areas of risk, It is important when handling channels and accessories that relevant PPE is worn and site health and safety guidelines are followed.



Transporting Swarm Aqua Channels

Swarm Aqua® channels are delivered in tessellated 2m bundles no more than 1.2m wide. When arriving on site it is recommended that the bundles are kept together and a forklift is used to move the bundle to a safe area where the channels can be stored until they are ready to be installed. Preferably this area is covered and in an area where possible damage to the channels is minimal.



Site Off-loading Facilities

Swarm Aqua® channels are delivered on flat lorries without hi-ab or off-loading facilities. It is the responsibility of the site receiving delivery to arrange for mechanical site off-loading facilities.

Recycling & Swarm Aqua®

Swarm Aqua® is manufactured from a variety of components, which when combined provide a product that is recycled, recyclable, sustainable with a long life expectancy.

With the quality of our suppliers and the components that we use, we always make sure that the environmental impact of our products and processes remains as minimal as possible.

Our suppliers are accredited with ISO 9001, ISO 14001, OHAS 18001, BBA, HAPAS Roads & Bridges which is a testament to their respective dedication to quality and the environment.

Ductile Iron

The top casting of Swarm Aqua® channels is manufactured from ductile iron. This iron part once installed should never need to be removed and has a design life of well over 100 years, although it is a 100% recyclable part.

The raw material that goes into manufacturing this part is cast from 75-99% recycled iron from a wide range of sources that could otherwise be sent to landfill.

The foundry where Swarm Aqua® tops are cast like to take things one step further however, they shred and reuse waste paper on-site to be used in packaging, and have installed energy and water saving measures throughout their site.

Galvanised Steel

Steel walls form the sides of the Swarm Aqua® channels. Steel is a 100% recyclable material and generally contains around 25% of recycled materials.

The use of scrap steel saves up to 74% of the energy needed to make steel from virgin materials.

Recycling one tonne of steel cans saves:

- 1.5 tonnes of iron ore
- 0.5 tonnes of coke
- 1.28 tonnes of solid waste
- Reduces air emissions by 86%
- Reduces water pollution by 76%

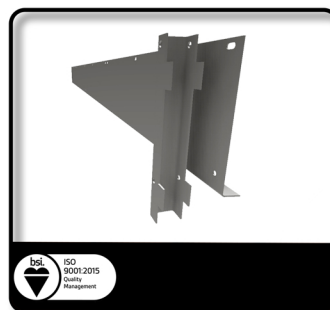
HDPE Pipe

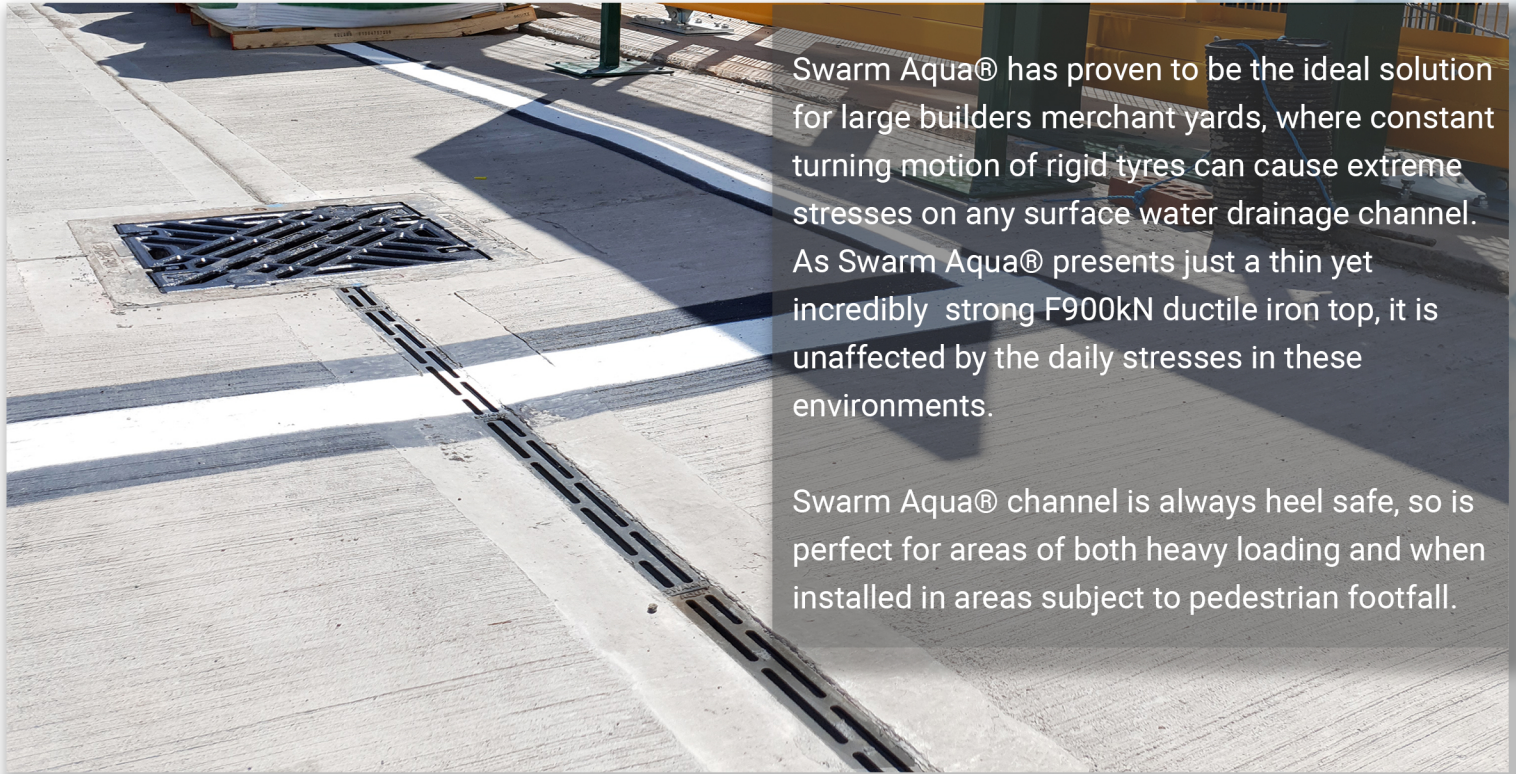
The twinwall channel part of Swarm Aqua® is manufactured from 100% recycled HDPE, which itself is also 100% recyclable as it is one of the easiest plastic polymers to recycle. In addition to its green properties, the twinwall pipe also has a design life of over 60 years, which means that not only is it environmentally conscious, it also doesn't require remedial, repair or replacement works once installed.

Other uses for HDPE include plastic shopping bags, trays, tanks, food containers, pipe fittings, hinges, cutting boards, wear plates and more.

The worldwide market for HDPE plastics is around 30 million tons per year.

Each length of Swarm Aqua uses up to 858 recycled HDPE plastic bottles.





Swarm Aqua® has proven to be the ideal solution for large builders merchant yards, where constant turning motion of rigid tyres can cause extreme stresses on any surface water drainage channel. As Swarm Aqua® presents just a thin yet incredibly strong F900kN ductile iron top, it is unaffected by the daily stresses in these environments.

Swarm Aqua® channel is always heel safe, so is perfect for areas of both heavy loading and when installed in areas subject to pedestrian footfall.

After recently moving to their new home these owners decided they would put a double driveway at the front of their house. The contractor offered them a traditional mesh grating system in their quote but after seeing the quality of Swarm Aqua®, the owners decided that they wanted to use something better. They chose Swarm Aqua® because they wanted a much stronger, discreet yet still pedestrian friendly system that would stand the test of time.

Swarm Aqua® is available in a range of sizes from 100mm to 600mm wide with a loading capability up to F900kN. Suitable for any application and surface finish from a residential driveway through to a major distribution centre.



TORkerb **Combined Kerb Drainage**

TORkerb is a fully recycled and recyclable monolithic, single piece Combined Kerb Drainage system (CKD) certified for loading up to D400kN.

✓ Lightweight

TorKerb has been designed to be as lightweight as possible whilst retaining the required strength for a kerb drain product. The majority of units are below 25kg for manual handling.

✓ Impact Resistant

An advantage to using TorKerb's composite materials over traditional concrete and polymer concrete is its flexural strength. Giving Torkerb great impact resistance before, during and after installation

✓ Strong & Robust

The constituent materials of TorKerb when combined are exceptionally strong and comply with BSEN1433 Group 3 kerbside installations load class D400kN.

✓ Chemically Resistant

TorKerb is resistant to all forms of effluents found in highway situation, such as road salts and expected hydrocarbons.

TORkerb HB

Code	Description	Depth (mm)	Invert (mm)	Length (mm)	Weight (kg)
TKHB305005	TORkerb 305mm Half Batter	305	275	500	15
TKHB385005	TORkerb 385mm Half Batter	385	355	500	18
TKHB480005	TORkerb 480mm Half Batter	480	450	500	24

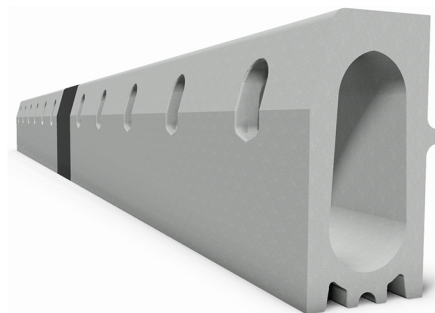
Rodding Access

Code	Description	Depth (mm)	Invert (mm)	Length (mm)
TKHB305020	TORkerb 305mm Access Unit	305	275	250
TKHB385020	TORkerb 385mm Access Unit	385	355	250
TKHB480020	TORkerb 480mm Access Unit	480	450	250



Gully Outfall Top & Riser

Code	Description	Depth (mm)	Invert (mm)
TKHB305045	TORkerb 305mm Outlet Unit	305	275
TKHB385045	TORkerb 385mm Outlet Unit	385	355
TKHB480045	TORkerb 480mm Outlet Unit	480	450



Universal End Caps

Code	Description	Dims (to suit)
TKU005	TORkerb Universal End Cap	305 - 480
TKU005	TORkerb Universal End Cap	305 - 480
TKU005	TORkerb Universal End Cap	305 - 480

All TORkerb units are available in both Half-Battered and Splayed configurations.

Combined Kerb Drainage

Radius Units

Radius units are supplied to site requirements in a wide range of units from 5m to 16m radii.

Code	Description	Depth (mm)	Length (mm)	Weight (kg)
Various	305mm Radius	305	500	17
	385mm Radius	385	500	20
	480mm Radius	480	500	26

90 Degree Angles

Angle units are available for both internal and external corners subject to site requirements. This enables the continuation of hydraulic flow around corners without changing the aesthetic of the project.

Code	Description	Depth (mm)	Length (mm)	Weight (kg)
TKHB305074	305mm 90Deg	305	500	17
TKHB385074	385mm 90Deg	385	500	20
TKHB480074	480mm 90Deg	480	500	26

Solid Faced Units

Kerb units are sometimes required without drainage inlets. Typically around elevated surfaces such as traffic calming humps or raised platforms. Torrent Water Management are able to supply these units for all sizes of CKD.

Code	Description	Depth (mm)	Length (mm)	Weight (kg)
TKHB305010	305mm Solid	305	500	15
TKHB385010	385mm Solid	385	500	18
TKHB480010	480mm Solid	480	500	24

Centre Stones

305, 385, 480mm centre stones with either 25mm upstand or flush/6mm are available as required dependant on the installation detail.

Code	Description	Depth (mm)	Length (mm)	Weight (kg)
TKHB305035	305mm Solid	205-180	458	12
TKHB385035	385mm Solid	285-260	458	15
TKHB480035	480mm Solid	380-355	458	19
TKHB305040	305mm Slotted	205-180	458	12
TKHB385040	385mm Slotted	285-260	458	15
TKHB480040	480mm Slotted	380-355	458	19



Specification Info:

When specifying items specific to your project such as radius units, centre stones or angled units it is important to specify the varying dimensions for each item. For example when specifying a radius unit, a *m radius should be specified. For corner units an internal or external corner should be specified.

K-Form Screed Railing

K-Form Concrete Formwork Systems offer a revolutionary and efficient shuttering product that saves the contractor time and money with less labour. Swarm suggest the use of the K-Form Screed Railing system in conjunction with Swarm Aqua channels and gratings, this can increase the installation speed, quality and ensures that expansion of the slab is allowed for.

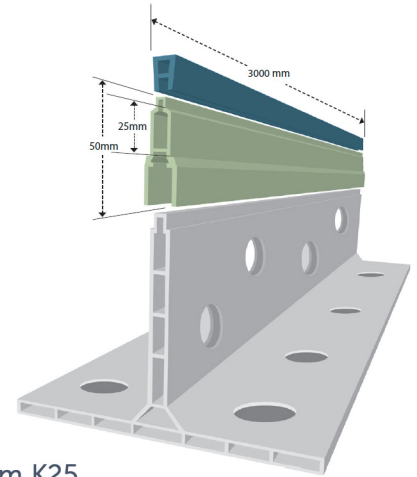
K-Form plastic shuttering systems are a light weight, uPVC cast in place screed rail, strong enough to handle all types of mechanical screeds as well as providing control, construction and isolation joints. Straight quality joints are achieved every time while being versatile for all types of concrete slabs.

uPVC is sourced from landfill diverted double glazing window frames making K-Form a completely recycled product which has the same UV and temperature stability as the original frame it came from.

Key Benefits

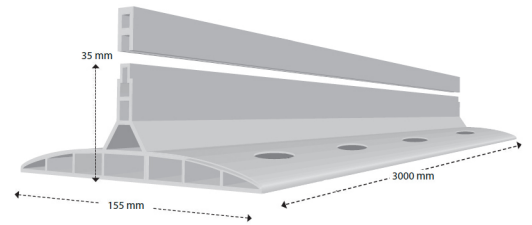
- No specialist tools required.
- All types of power screeds are suitable to use with K-Form.
- K-Form is strong enough to handle all types of leveling equipment.
- Resistant to petrol, diesel and oil.
- K-Form stays in place without backfilling or holding with stakes.
- Enables adjoining bays to be poured consecutively.
- Pre-drilled anchoring holes.
- Fixing to steel decks possible.
- No need to remove and clean.
- Separate wear strip can be removed for sealing.

Would you like to know more?
Visit our website www.swarmwm.co.uk



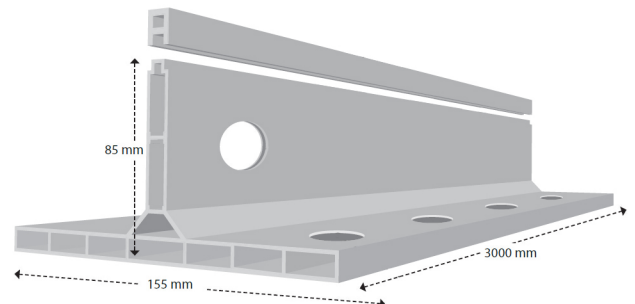
K-Form K25

- To increase screed height by 25mm.



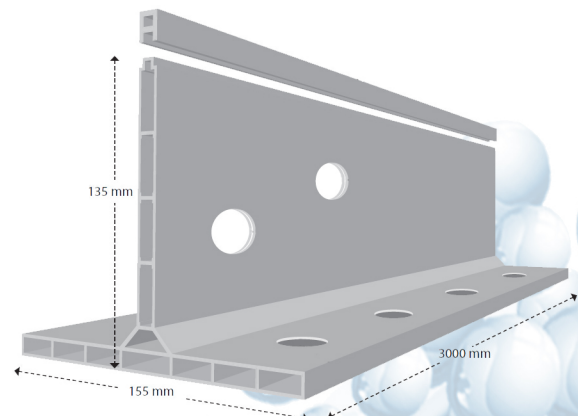
K-Form K35

- For pours of 50-100mm thick concrete or screed



K-Form K85

- For pours of 100-140mm thick concrete or screed



K-Form K135

- For pours of 150-225mm thick concrete or screed



K-Form and screeds

K-Form is intended to be used with all types of screeds including Twin Beams, Bunyan Rollers, Vibro Strikes etc. K-Form's K135, K85, and K35 sacrificial railing replaces steel forms where joints are needed.



These products are supplied by us through our partner K-Form.

Our Partners

K-Form



Founded in Northamptonshire in 2003, Bridgend Extrusion Limited is a privately owned limited company that produces the K-Form cast in 100% recycled uPVC plastic shuttering system for the concrete road forms sector of the construction industry. With an integral joint system and a removable top strip, K-Form's easy to use concrete shuttering system is a patented design.

In 2010, Bridgend Extrusion Limited moved to South Wales to manufacture the range of K-Form formwork systems and plastic screed rails.

K-Form has now been sold to all corners of the globe including: USA, Australia, Scandinavia, Middle East, Caribbean, Europe, and South America.

Bridgend Extrusion Limited

K-Form is a 100% recycled PVC formwork and shuttering system used in the construction industry for Screed Rail, Concrete Slab Forming work & Concrete Paving / Forming.

K-Form undertake Concrete Paving, Decorative Concrete, Pavement, Driveway, Flatwork, Foundation, Floor & all Concrete Pouring work.

JFC Civils



JFC is a specialist manufacturer of plastic drainage pipe and water management solutions for the civil engineering and construction sectors. Our CorriPipe twinwall drainage pipe has been used in numerous large scale projects throughout Ireland and the UK. Offering expert advice and a comprehensive range of fittings and accessories JFC is the brand of choice for leading contractors and project managers.

JFC also offer an extensive portfolio of Attenuation & Stormwater Management solutions ideal for surface water drainage applications. We have also extended our expertise to offer Fat, Oil & Grease Management systems for domestic and commercial applications. Our domestic grease trap and commercial grease separators provide a simple solution to solving the problems associated with waste grease (fat/oil) build-up which causes major problems in drainage systems.

As part of the multi-national JFC Group we have achieved a leading market position by continually developing trend setting products that meet and exceed the ever-changing needs of our customers. Through continuous investment in our people, R&D and pioneering technology JFC has become a global specialist in plastic manufacturing. Our products are also quality approved to the internationally recognized ISO 9001 – 2008 standard.

We pride ourselves in nurturing strong, trusted relationships with our customers. Our blend of market knowledge and technical expertise allows us to deliver distinctive customer service from initial project specification through to completion. We endeavor to respond quickly to changing customer needs and market developments and consistently refine our products to bring new and innovative solutions to market.

Swarm Aqua® Channels

Code	Description	Product Information					
		Loading	Weight	Length	Height	Width	Invert
SA01	100mm Swarm Aqua®	F900	24kg	2.0m	282mm	112mm	262mm
SA02	150mm Swarm Aqua®	F900	25kg	2.0m	348mm	178mm	328mm
SA03	225mm Swarm Aqua®	F900	28kg	2.0m	435mm	265mm	415mm
SA04	300mm Swarm Aqua®	F900	31kg	2.0m	524mm	354mm	504mm
SA05	375mm Swarm Aqua®	F900	37kg	2.0m	596mm	426mm	576mm
SA06	450mm Swarm Aqua®	F900	41kg	2.0m	682mm	512mm	662mm
SA07	600mm Swarm Aqua®	F900	56kg	2.0m	850mm	680mm	830mm



Swarm Aqua® Combined Boxes

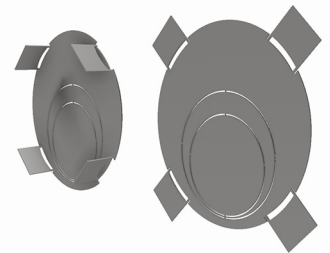
Code	Description	Product Information				
		Loading	Weight	Length	Height	Width
SD01	Small Combined Box	D400*	31kg	524mm	610mm	450mm
SD02	Large Combined Box	D400*	48kg	605mm	750mm	675mm

*Swarm combined boxes are supplied with D400kN covers as standard



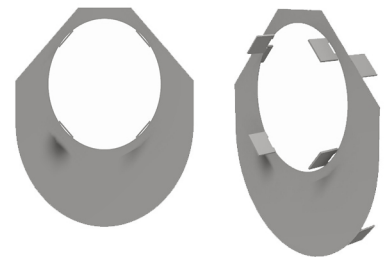
Swarm Aqua® End Caps

Code	Description	Product Information					
		Loading	Weight	Length	Height	Width	Invert
SB01	100mm End Cap	N/A	1kg	1.5m	112mm	112mm	Channel
SB02	150mm End Cap	N/A	1kg	1.5m	178mm	178mm	Channel
SB03	225mm End Cap	N/A	1kg	1.5m	265mm	265mm	Channel
SB04	300mm End Cap	N/A	2kg	1.5m	354mm	354mm	Channel
SB05	375mm End Cap	N/A	2kg	1.5m	426mm	426mm	Channel
SB06	450mm End Cap	N/A	2kg	1.5m	512mm	512mm	Channel
SB07	600mm End Cap	N/A	3kg	1.5m	680mm	680mm	Channel



Swarm Aqua® Transition Pieces

Code	Description	Product Information					
		Loading	Weight	Length	Height	Width	Invert
SC01	100/150 Transition	N/A	1kg	1.5m	198mm	178mm	Channel
SC02	150/225 Transition	N/A	1kg	1.5m	285mm	265mm	Channel
SC03	225/300 Transition	N/A	1kg	1.5m	374mm	354mm	Channel
SC04	300/375 Transition	N/A	2kg	1.5m	446mm	426mm	Channel
SC05	375/450 Transition	N/A	2kg	1.5m	532mm	512mm	Channel
SC06	450/600 Transition	N/A	3kg	1.5m	700mm	680mm	Channel



Swarm Aqua® Chamber Connectors

Code	Description	Product Information					
		Loading	Weight	Length	Height	Width	Invert
SS01	100mm Connector	N/A	1kg	450mm	112mm	112mm	Channel
SS02	150mm Connector	N/A	1kg	450mm	178mm	178mm	Channel
SS03	225mm Connector	N/A	1kg	450mm	265mm	265mm	Channel
SS04	300mm Connector	N/A	2kg	450mm	354mm	354mm	Channel
SS05	375mm Connector	N/A	2kg	450mm	426mm	426mm	Channel
SS06	450mm Connector	N/A	2kg	450mm	512mm	512mm	Channel
SS07	600mm Connector	N/A	3kg	450mm	680mm	680mm	Channel



Reinforcement

In order to meet some loading criteria, Swarm Aqua channels may require reinforcement within the concrete surround. The responsibility to design the reinforcement is that of the project engineer, however Swarm can provide independently generated structural guidelines for these scenarios.

SWARM *Hive*

Project Lead Specification

At Swarm we are looking from a new and exciting perspective. We don't want to offer products for the sake of selling products, rather we want to generate the optimal solution for any given project.

By working together with companies that have expertise in each of their fields we are able to identify the needs of each project as they arise and provide a solution.

Swarm Water Management as a company are a supplier of surface water management products to cater for anything from low to High Capacity Drainage Products. We focus on providing an all-encompassing solution to contractors in order to bring value and efficiency to every project.

We have created our own product to compliment the ranges available through our partners who use tried and tested industry standard components.

By working in collaboration with respected suppliers we offer products to suit most projects.

Find out how using Swarm Aqua® can save you time and money, visit: www.swarmwm.co.uk

SWARM
WATER MANAGEMENT

Swarm Aqua® is a hybrid surface water drainage system that combines the benefits of proven materials and robust manufacturing techniques to create an exceptional surface water drainage product for external use. With a focus on strength, rigidity and lighter weight, Swarm Aqua® provides the perfect solution.

