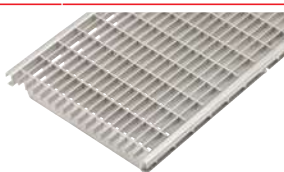


Gratings for use with ACO MultiDrain® M200DS channels with stainless steel edge rails



Grating for Load Class B 125 applications

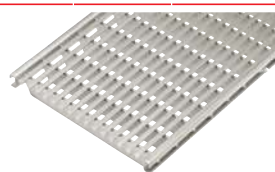
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width /hole Ø (mm)	Heelguard™	Intake area (mm²/m)	Anti shunt feature	Weight (kg)
133615	Heelguard™ mesh stainless steel 133615DL	1000	223	40	29 x 10	Yes	157500	Yes	7.3
133616	Heelguard™ mesh stainless steel 133616DL	500	223	40	29 x 10	Yes	157500	Yes	3.7
133631	Intercept-Profile stainless steel 133631DL	1000	223	39	29 x 8	Yes	84600	Yes	7.4
133632	Intercept-Profile stainless steel 133632DL	500	223	39	29 x 8	Yes	84600	Yes	3.6
133635	Intercept-Bar stainless steel 133635DL	1000	223	35	29 x 6	Yes	86600	Yes	8.0
133636	Intercept-Bar stainless steel 133636DL	500	223	35	29 x 6	Yes	86600	Yes	4.0



133615DL / 133616DL
Heelguard™ mesh stainless steel



133631DL / 133632DL
Intercept-Profile stainless steel

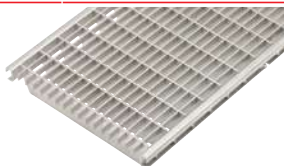


133635DL / 133636DL
Intercept-Bar stainless steel



Grating for Load Class C 250 applications

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width /hole Ø (mm)	Heelguard™	Intake area (mm²/m)	Anti shunt feature	Weight (kg)
133619	Heelguard™ mesh stainless steel 133619DL	1000	223	46	30 x 10	Yes	137700	Yes	10.7
133620	Heelguard™ mesh stainless steel 133620DL	500	223	46	30 x 10	Yes	137700	Yes	5.3

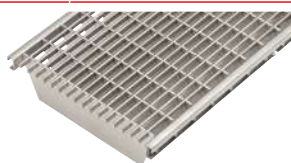


133619DL / 133620DL
Heelguard™ mesh stainless steel



Grating for Load Class D 400* applications

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width /hole Ø (mm)	Heelguard™	Intake area (mm²/m)	Anti shunt feature	Weight (kg)	
133623	Heelguard™ mesh stainless steel 133623DL	6	1000	223	65	30 x 10	Yes	137700	Yes	13.0
133624	Heelguard™ mesh stainless steel 133624DL	6	500	223	65	30 x 10	Yes	137700	Yes	6.5
408998	Brickslot single slot stainless steel	1000	223	105	10	Yes	10000	No	9.8	
408999	Brickslot single slot stainless steel	500	223	105	10	Yes	10000	No	4.8	
409000	Brickslot single slot access unit stainless steel 409000	500	223	105	10	Yes	10000	No	8.5	



133623DL / 133624DL
Heelguard™ mesh stainless steel



408998/408999 Brickslot
single slot stainless steel



409000
Brickslot single slot access unit stainless steel



ACO can manufacture Brickslot grates in a wide range of sizes for specific site requirements. Twinslot grates (as seen in the M100DS section) can also be manufactured for use with M200DS channels. For more information please contact your sales representative.

Grating accessories

Product code	Description	For use with	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
445834	Drainlock™ security locking assembly Mesh**	133615, 133616, 133619, 133620, 133623, 133624	195	20	13	0.1
445836	Drainlock™ security locking assembly Profile**	133631, 133632	195	27	13	0.13
445835	Drainlock™ security locking assembly Bar**	133635, 133636	195	27	13	0.11
1367	Drainlock™ grating lifting tool	all	400	150	6	0.2



445834
Drainlock™ security locking assembly Mesh**



445836
Drainlock™ security locking assembly Profile**



445835
Drainlock™ security locking assembly Bar**



1367
Drainlock™ grating lifting tool 835

6 Indicates security locking available.

*Not suitable for carriageways of public roads or motorways.

**Standard allen key required.

Note: 1m grates require 2pcs of Security locking assemblies and 0.5m grates require 1pc.

These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

Channel footpath drainage



CHANNEL FOOTPATH
DRAINAGE

CHANNEL FOOTPATH
DRAINAGE



Load Class

Channel footpath drainage is specifically used where roof drainage from down pipes is required to cross the footpath into the road gutter. Combining an ACO Downpipe connector and ACO Kerb outlet with ACO MultiDrain® M100D/M100DS channel creates a safer method for water to cross pedestrian areas.

The system can be installed with either a grated channel or solid cover and is suitable for Load Class D 400 applications. The high load class is required as vehicles may occasionally mount the kerb, and ACO's channel footpath drainage has been designed to withstand these loads.



Channel footpath drainage

The ACO MultiDrain® M100D/M100DS system includes a range of accessories which provide a drainage solution ideal for areas where down pipes from roofs and gutters exit on to the pavement. The ACO Channel Footpath drainage system effectively carries water away from paved areas and across into the adjacent carriageway.

The system uses ACO MultiDrain® M100D/M100DS shallow depth channels and has two types of kerb outlets and down pipe connectors to suit application requirements.

Shallow channels

ACO MultiDrain® MD shallow depth channels are available in two sizes, 75mm and 100mm total depths (ACO M100D / M100DS 075 and ACO M100D / M100DS 0100) and have the option of galvanised or stainless steel edge rails.

Downpipe connectors

Two down pipe connectors are available to suit channel depth. Manufactured from grey polymer concrete the down pipe connector has a clear opening of Ø75mm and connects to down pipes with outside diameters of up to 82mm.

Kerb outlets

Two outlets are available to suit the kerb profile of the application, a CFD half battered kerb outlet to suit standard HB kerbs and a CFD Bull nose kerb outlet to match BN kerbs. Manufactured from grey polymer concrete the kerb outlets allow rainwater to discharge into the road gutter from this system.

Gratings

Traditionally solid ductile iron covers are selected in channel footpath drainage applications but all ACO MultiDrain® M100D/M100DS gratings are suitable for use with this system. The system's load class rating is determined by the grating selected, further information of gratings within the range can be found on pages 21–27 and 32–37.

ACO MultiDrain® M100D shallow depth channels with UltraSTEEL™ galvanised edge rails

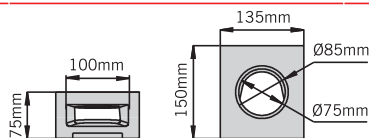
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23075	M100D No. 075	1000	135	75	55	1	9.2
23076	M100D No. 075V	1000	135	75*	55	1	8.9
23110	M100D No. 0100	1000	135	100	80	1	11.0
23111	M100D No. 0100V	1000	135	100*	80	1	10.7

ACO MultiDrain® M100DS shallow depth channels with stainless steel edge rails

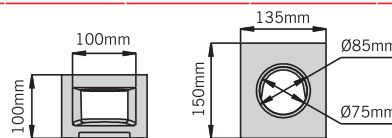
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
24075	M100DS No. 075	1000	135	75	55	1	10.9
24076	M100DS No. 075V	1000	135	75*	55	1	10.6
24110	M100DS No. 0100	1000	135	100	80	1	12.7
24111	M100DS No. 0100V	1000	135	100*	80	1	12.4

Down pipe connectors

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23450	CFD075 downpipe connector grey	150	135	75	n/a	n/a	2.4
23451	CFD0100 downpipe connector grey	150	135	100	n/a	n/a	3.0



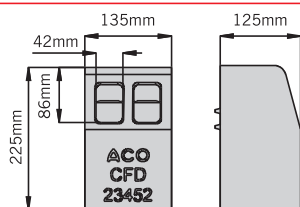
CFD 075 downpipe connector



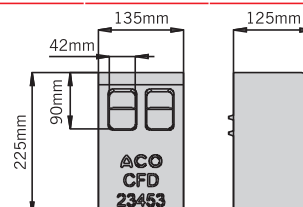
CFD 0100 downpipe connector

Kerb outlet profiles

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23452	CFD kerb outlet half batter grey	125	135	225	n/a	n/a	6.7
23453	CFD kerb outlet bull nose grey	125	135	225	n/a	n/a	7.0



CFD kerb outlet half batter



CFD bull-nose kerb outlet

Note: V Indicates channel with cast in triple lipped seals for water tight connection. See page 41 for further details.

* 075V and 0100V channels have a depth overall around the outlet of 80mm (075V) and 105 (0100V).

These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

ACO Downpipe connectors for use with the MultiDrain systems

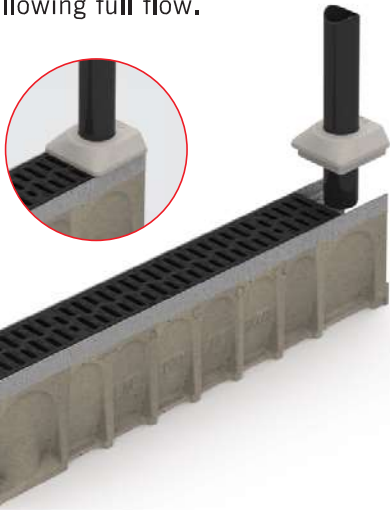
The ACO rainwater downpipe channel connector is an effective method for connecting downpipes directly into the channel body, eliminating the risk of blockages and allowing full flow.

The connector is maintenance friendly and can be easily lifted from the channel to clear localised blockages without the need to lift the entire grating. The connector can be positioned in line or perpendicular to the channel depending on the installation location and has an overhang lip to hide the cut edge of the adjacent grating – resulting in a tidy and safe installation.

The connector is offered in a range of sizes and colours for circular or square downpipes. The connectors can be used on a variety of channels including MultiDrain, MultiDrain PPD and Multiline Sealin.

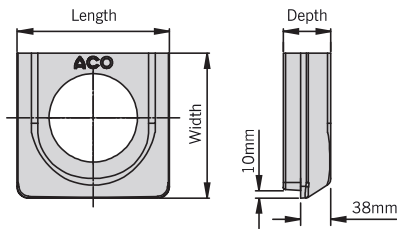
Details of the MultiDrain PPD and Multiline Sealin ranges can be found on the ACO website: www.aco.co.uk

- ▶ Direct connection into the channel eliminating blockages in the grating
- ▶ Quick and simple installation
- ▶ Easy maintenance
- ▶ Sizes, shapes and colours to suit most downpipes and installations



Black Downpipe connectors

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
27132	Downpipe connector, M100D/PPD Ø68mm*	142	133	60	1.07
27138	Downpipe connector, M100D/PPD Ø 65mm*	142	133	60	1.04
27150	Downpipe connector, M150D/PPD Ø110mm	192	183	60	1.65
27152	Downpipe connector, M150D/PPD Ø 100mm	192	183	60	1.66
27155	Downpipe connector, M200D/PPD Ø110mm	242	233	60	2.58



Grey Downpipe connectors

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
27133	Downpipe connector, M100D/PPD Ø68mm*	142	133	60	1.07
27139	Downpipe connector, M100D/PPD 65mm*	142	133	60	1.04
27151	Downpipe connector, M150D/PPD Ø110mm	192	183	60	1.65
27153	Downpipe connector, M150D/PPD 100mm	192	183	60	1.66
27154	Downpipe connector, M200D/PPD Ø110mm	242	233	60	2.58



*Also compatible with ACO HexDrain Pro and ACO CivicDrain

These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

Preparing the system for installation

Channel base knockout details

All ACO MultiDrain® MD constant depth channels in the height range 0.0 to 30.0 are supplied with a pre formed knockout detail in the base of the channels. This knockout detail positioned at the male end of the channel allows a vertical connection to be made from the channel to a Ø110mm (100mm wide bore) or Ø160mm (150mm and 200mm wide bore) PVC-U pipe system. The knockout detail on the base of the channel is indicated by a "hammer" symbol. The method of removal and pipe connection is described below.



Knockout detail.

FUNCTIONS:

Step 1: Pre formed knockout detail



Step 2: Support channel around knockout detail by placing the channel on sand or soft earth for example. Tap the knockout panel from the side indicated by the Hammer symbol to remove panel.



Step 3: Push fit pipe into recess provided and seal as required. For recommended sealants refer to the section headed "watertight sealing".



Channel side wall connection detail

An additional feature provided on all 500mm long channels are removable side wall panels, which allow channel runs to be connected together to form "T" or "L" junctions for continuous water flow through the system. Where channel connections are to be made to the side wall of these units a female joint detail is provided to aid alignment and fast installation.



Removable side wall panel.

FUNCTIONS:

Step 1: Using a disc cutter as shown, cut a cross into the panel provided. Ensure cuts extend to but not beyond the perimeter recess surrounding the removable panel.



Step 2: Tap segments of panel between the cuts to remove the panel.



Step 3: Use a chisel to tidy up any remaining material. Channel connection can now be made and sealed as required.



Shallow Channels

The ACO MultiDrain® MD shallow channels are available in either 75mm or 100mm overall depths. These units are ideal for use where installation depths are restricted such as in structural slabs, bridge decks and roofs. All units can be sealed for watertight installations as each unit is supplied with a preformed sealant groove (see section headed watertight sealing for further details).

The shallow channels identified with a "V" such as the 075V and 0100V units have a cast-in triple lipped seal in their base for push fit watertight connections to Ø110mm PVC-U pipe. These triple lipped seals are manufactured from SEBS-TPE have excellent chemical, UV and weather resistance.



FUNCTIONS:

Step 1: Ensure Triple lipped seal and pipe spigot are clean and free from debris



Step 2: Lubricate joint faces as required and push fit pipe into the seal. The pipe is fully fitted when the end of the pipe is flush with the internal base of the channel.



Step connector

Each width of MultiDrain® MD has available a Step connector manufactured from polymer concrete. This unit is used between constant depth channel joints where a stepped fall channel installation is required and takes up the 50mm height difference between units. The Step connector ensures a smooth water flow within the channel system.



Watertight sealing

ACO MultiDrain® MD channels are generally installed without a particular water seal. Once butt jointed and with a concrete surround a fairly watertight installation is achieved. If however a watertight system is required each MultiDrain® MD channel is provided with a sealant groove allowing the system to be sealed by the application of a flexible sealant either during or following installation. For rainwater applications we recommend a single component, polyurethane based elastomeric joint sealant such as BASF Masterflex 472 or Sika Sikaflex 11FC or similar.



Application of sealant to be in accordance with the sealant manufacturers recommendations, but for guidance a typical method of application is as follows.

Multifunctional endcap

A Multifunctional endcap is provided for each channel width that is designed to be used with all channel heights in each range. Manufactured from polypropylene these versatile endcaps can be adjusted on site to perform the function of a closing endcap or as an inlet/outlet endcap for connection to Ø110mm (100mm wide bore) or Ø160mm (150mm and 200mm wide bore) PVC-U pipe.

Cutting guide

Removable knockout panel



FUNCTIONS:

Step 1: Place Step connector into the base of the deeper channel to be jointed as shown.



Step 2: Push channel joint together to lock Step connector in place forming a smooth transition between units as shown.



FUNCTIONS:

Step 1: Jointing faces of the channels to be sound and cleaned to remove all loose material, dust, oil and grease. This can be done by the use of a wire brush.



Step 2: Butt joint the channels & install as per ACO installation instructions. Ensuring joints are still clean (surfaces can be damp but no water droplets should be evident) apply sealant with a cartridge gun approximately 5mm thick to the end face of the channel & completely fill the sealant groove. Note this type of channel can be sealed either at or following installation.



Step 3: Wipe excess sealant from the inside faces of the channel & inspect sealant groove to ensure it has been fully filled with sealant. Leave sealant to cure before use as per the sealant manufacturers recommendations.



FUNCTIONS:

Closing endcap: The endcap supplied fits directly to the deepest channel within the system. All other channel heights can be accommodated by simply cutting the endcap to suit. A cutting guide is printed on the front of the endcap plate. The endcap is fastened to the channel by two clips and can be connected to either male or female channel end.



Adjusting endcap.

Fitting endcap to channel

Inlet & Outlet endcap: The endcap has a knockout panel which can be removed with a hammer. Once fitted to the channel the endcap performs either an inlet or outlet function and is designed to provide a connection to Ø110mm (100mm wide bore) or Ø160mm (150mm and 200mm wide bore) PVC-U pipes.

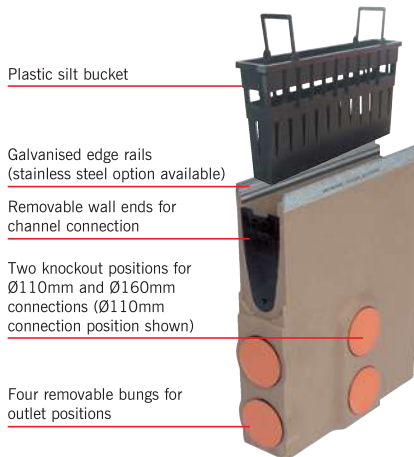


Adjusting endcap.

Fitting endcap to channel

Sump unit

A polymer concrete chamber unit which provides the capacity to hold water and silt, and also provides an outlet for the channel system.



Roddable foul air traps

A drain connector available in Ø110mm and Ø160mm for connection to foul or combined drainage. Foul air traps come complete with removable bung for rodding and are manufactured from highly durable recyclable MDPE.



ACO Universal gully

A recycled plastic & ductile iron modular system purposely designed for use with ACO channel drainage systems up to 200mm internal width. The system provides a high capacity for retaining water and also an outlet for the drainage system.



FUNCTIONS:

Step 1: Triple lipped seals for watertight connections.



Step 2: Unit wall ends can easily be removed using knife or saw.



Step 3: Two knockouts for Ø110mm and Ø160mm pipe connections. For knockout removal refer to method stated on page 45 headed 'Channel side wall connection detail'.



FUNCTIONS:

Step 1: Push the foul air trap into place.



Step 2: Bung can be removed for rodding



FUNCTIONS:

Step 1: Once installed ACO Universal gully can be cut to match channel depth



Step 2: The cut ACO Universal gully matches the profile of the ACO MultiDrain® MD channel.



Note: Full installation details are available to download from www.aco.co.uk



ACO's Polymer concrete repair kit is available for bonding applications, for instance where a mitred channel joint is to be made or for the repair of small areas of aesthetic damage. For further product details please see page 17.



ACO Drainlock™ Gratings

ACO Drainlock™

Fitted as standard to ACO MultiDrain® MD gratings, this fast locking device removes the need for bolts and bars and improves the channels hydraulic capacity. The Drainlock™ mechanism simply clips into the channel edge rail for rapid installation. An installation guide is shown opposite.



FUNCTIONS:



Push or stand on the grating until it clicks into place

Anti-shunt mechanism

A selection of the ACO Drainlock™ gratings are fitted with an anti-shunt mechanism that restricts unwanted grating movement when installed.



FUNCTIONS:



The anti-shunt lines the grate up to the channel and prevents the grates ability to move linearly. When cutting channels to required lengths, remember to also align the grate to the channel so the anti-shunt engages

Removal of grating

It is recommended that all ACO gratings are lifted with our Drainlock™ lifting tool, which allows quick and easy lifting of the grate close to the Drainlock™ mechanism.



FUNCTIONS:



Insert tool as shown. Drainlock™ lifting tool available part no 1367



To install, align the grating onto the channel
Align anti-shunt detail with recess



If your installation requires the channel to be cut or mitred, ensure the grate still aligns with the anti-shunt. Photo shows a bad installation where the grate overlaps the channel junction



Pull upwards to unlock grating



ACO Drainlock™ locking mechanism fastens into the channel. Gratings should be fitted in the channels before the installation concrete is installed

Security Locking

In areas such as schools and prisons, where unwanted grating removal needs to be restricted, a security locking can be used in conjunction with the following gratings; and options are available for most styles of galvanised and stainless steel grates. The system is fitted to the gratings by one or two M5/M6 screws and clamps the grating in place preventing removal. Security locking key for installation and removal supplied separately.

Grating selection

All channels within the ACO MultiDrain® MD range are certified to BS EN 1433: 2002 Load Class D 400. The system has a wide range of gratings suitable for use in a variety of applications from Load Class A15 to D 400*. Refer to the information on page 8 for load classes and typical applications. Please note when selecting a grating careful consideration should be given to the application requirement. Each grating has a certified load class which, once installed with the channel determines the system's load class.

FUNCTIONS:



For ductile iron grates, fix the security screws and clamp the grating as shown.



Place grating into the channel and tighten the fixing using the security locking key. Galvanised and stainless steel grate's security locking must be expanded rather than tightened to press against the Drainlock™ mechanism. Please refer to the Drainlock™ tables for more information.

Surface + Grating Visualiser

A clever, yet easy to use software program that visualises how our range of grating designs could enhance your project.



To make specification easier, the software will suggest our most suitable ranges based on the project requirements.

You can then select from the available options and visualise how these may look in different surface finishes. Once a choice is made, a simple, yet detailed specification sheet provides full product information.



To launch the visualiser scan the QR code or visit www.aco.co.uk/gratingvisualiser



Heelguard™ applies to ACOs range of 'Heel-friendly' products with slot widths up to and including 10mm. Suitable for most pedestrian applications and compliant to BS EN1433:2002. For specific widths please refer to grating details.

*Not suitable for carriageways of public roads or motorways

Design Software

ACO QuAD Hydraulic Design Software

TRY OUR FREE DESIGN TOOL

The new free-to-use ACO QuAD Hydraulic Design software has unprecedented levels of choice and flexibility built-in, to enable the efficient and accurate hydraulic design of any surface water management scheme.

The hydraulic engine has been robustly tested and is the tool used by ACOs own internal Design Services team in modelling surface water solutions for customers.

ACO QuAD Hydraulic Design software uses differential equations for spatially varied flow that online alternative solutions cannot accurately match. For example the Manning's equation for steady uniform flow does not work with level channels and is grossly inaccurate on shallow gradients.



Here are some of the features it includes:

- Powerful project-based software
- Create catchment models that are fully editable
- PDF summary document output
- Cloud based – All designs are stored securely on our server against your login
- Integrated rainfall data for the whole of the UK

To use the QuAD Hydraulic Design software visit: www.aco.co.uk/quad-hydraulic-design-2.0

QUAD FEATURES OVERVIEW

Cloud based

The software means increased efficiency providing design resources you need when you need it, allowing you to deploy the same design capability consistently, with the same consistency in results every time.



Flexible download format

Output can be generated for all or parts of the project and can be generated in pdf or CSV formats.



Secure scheme filing

All designs created by registered users are stored on a secure server and are password protected. Past projects are easily retrieved from the personalised menu.



Flexible catchment design

QuAD is designed to support designers in the creation of catchment areas. Supplementary catchment areas can easily be added upstream and downstream of any previously designed channel run.



Application

Application selection ensure designers are able to get quick and accurate guidance in selection of the most suitable products based on the type of application the catchment is to cater for.



Knowledge database

There is support available either through a query submission or through self-help made possible by the comprehensive Knowledge database.



Product optimiser

Optimising the specific channel runs can be done with the optimiser feature selecting the smallest product suitable. Excavation and concrete requirements are also provided.



Attenuation assessments

Calculate the attenuation required for the project and compare it with the storage available in the channel design. Attenuation volume is presented along with suitable options for storage.



Rainfall assist

Rainfall intensity by location matters in design. QuAD provides a site locator map enabling the most accurate intensity to be input.



Resilience assessment

By inputting anticipated sedimentation rates and sedimentation density the QuAD software enables the designer to test their suggested maintenance schedules.



Register Now - It's Free

www.aco.co.uk/quad-hydraulic-design-2.0

Design Support Services

Surface water management system design can often be a complex task. Success in combining products and processes requires a thorough understanding of how these different elements work together.

The ACO Design Services Team is able to work closely with you through the entire design process to ensure accurate and cost-effective product selection is made.

Services we offer include (free and without obligation):

- Whole system design, from collection to the attenuation of surface water
- Hydraulic calculations and AutoCAD detailing
- Parts schedules

ACO has embraced the concept of value engineering as an approach to on-site construction that saves both time and money.

ACO will review any design to minimise the total scheme and life cost of a proposal. The team can suggest the most appropriate range depending on your requirements.

Some ranges like MultiDrain or MonoDrain allow water to be contained and conveyed close to the surface, which accords with the principles advocated for Sustainable Drainage (SuDS Manual, 2015), by removing the need for pumping. Other ranges like Qmax allow attenuation – the storage of large volumes of water during storm events, reducing overall site costs.

For detailed designs using the ACO Hydraulic Design Software, please contact the ACO Water Management Design Services Team.

If manual calculations are preferred to using our QUAD software, hydraulic tables and instructions for manual calculations can be provided.

ACO Water Management Design Services Team

Tel: 01462 816666

Email: technical@aco.co.uk

ACO BIM MODELS

BIM is the process of generating and managing data, and developing collaborative behaviours that will unlock new and more efficient ways of working at all stages of the project life-cycle. These files will help contractors specify and optimise drainage systems in line with the overall benefits of BIM-enabled

working, including faster project delivery, reduced costs, reduced waste and greater project predictability.

Depending on the product range Civils3D, IFC or Revit files are available for download.

www.aco.co.uk/aco-bim-models



Professional Development

Helping create knowledge champions

In today's ever-changing construction industry, it has never been more important to ensure you are up to date with current industry trends and new innovations. Surface water management is one of the most dynamic sectors of the construction industry with new legislation, innovative products and ground-breaking materials constantly emerging.

Depending on your professional body or employer, you may be required to undertake between 20 and 30 hours CPD per year. ACO understands this can be a daunting task and has developed a series of professional

development courses that can be accessed in a number of ways including online, in-office or at our state-of-the-art training facility at ACO UK office headquarters in Bedfordshire.

The courses have been carefully developed to provide essential learning and knowledge and are delivered by ACO's UK wide experienced Business Development Team ensuring that only the highest quality content is delivered.

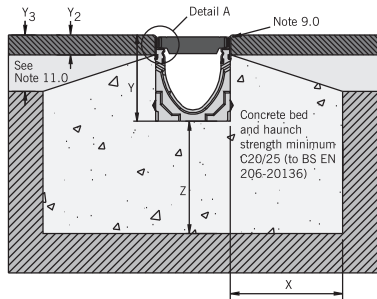


To find out more and book a professional development course, visit: www.aco.co.uk/professional_development

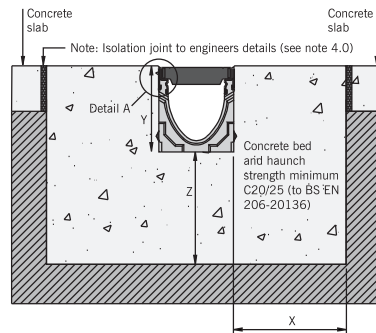
Installation detail

CHANNELS WITH TRADITIONAL GRATINGS

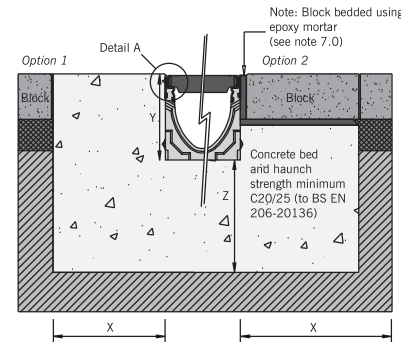
Asphalt pavement



Concrete pavement



Block pavement



1.0 Load Class

Installation recommendations shown are ACO minimum recommendations for BS EN 1433:2002 load class requirements.

2.0 Ground Conditions

The long term performance of a channel installation to sustain vertical and lateral loads depends upon a) ground conditions, b) stability of the adjacent pavement and c) a durable concrete bed and surround. The recommended installation detail may require the minimum dimensions to be revised to achieve site specific load class requirements (referred to in 1.0 above).

3.0 Cutting and Jointing

Mitre joints are formed by cutting the channels to the required angle and butting them together with the appropriate sealant (e.g. Sikaflex 11FC or similar) or ACO Repair Kit. Where possible 90° joints and T's should be formed so that gratings do not have to be cut. Angles can be formed by connecting them using proprietary PVCu pipework attached to the ACO inlet/outlet endcaps. For further details please contact ACO Design Services Team. Note: For load classes higher than C 250, mitred joints are not recommended in vehicular areas. Where requested ACO can custom manufacture angled joints to order.

4.0 Isolation Joints

The channel must be isolated from the surrounding environment. An isolation joint must be positioned up to 1500mm from the channel wall. Any dowel bars must be located no nearer than 150mm from the channel wall. Other isolation joints in surrounding slab must be continued through the channel. Additional crack control may be required to comply with specifier requirements.

5.0 installation into in-situ slab

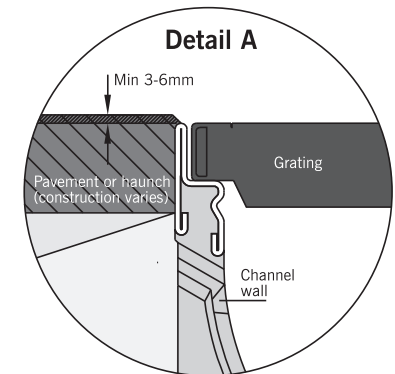
Where a channel is to be installed into an existing concrete slab it is necessary to cut a suitably sized pocket in the slab. The channel will then need to be bedded in polymer modified mortar of 25mm minimum thickness (this may vary depending on the type of mortar used). Engineering advice may be necessary.

6.0 Temporary installation

A channel installation is not complete until the final surfacing is laid. In any temporary condition, i.e., the channel walls projecting above adjacent ground, site traffic should not cross channels. Loose boards, stone fill or cover plates will not protect the channel walls or grating. A temporary channel crossing should be formed by raising the ground level locally, to 3-6mm above top of edge rail, either side of a channel for a distance of 750 to 1000mm, to form ramps. Note that the channel load class should be adequate to carry the site traffic.

7.0 Block pavements

The channel must be supported laterally. Blocks laid directly against the channel must be laid as a soldier course and restrained from movement by bedding securely on the concrete haunch e.g. by using a polymer modified mortar for bed and perpendicular joints (e.g.. RONAFIX mortar mix C or similar). Blocks or slabs bedded on sand remote from the channel should be set at a higher level to compensate for possible settlement of the paving in service.



8.0 Grate locking system

Gratings should be securely fixed to the channel, where required, using an appropriate grate lock system (where available).

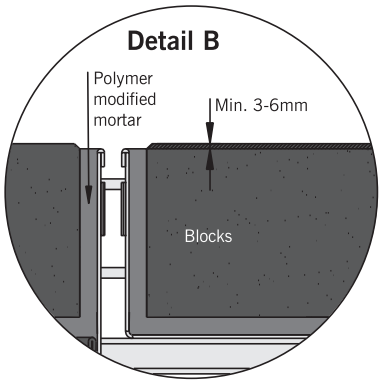
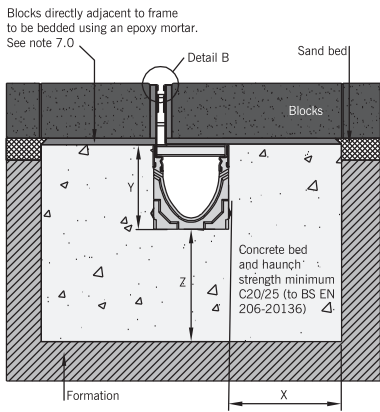
9.0 Channel protection

Avoid contact between compaction equipment and top of ACO channel edge rail. The installer must ensure that the finished surface level lies above the top of the edge rail (by at least 3-6mm). Covering or protecting the grating, before concreting the haunch or laying blocks, removes the time and cost associated with cleaning the channel and grating of cement material and embedded stones. (Please note that ACO channels must be installed with the grating in place to prevent deformation of the channel.)

Installation detail

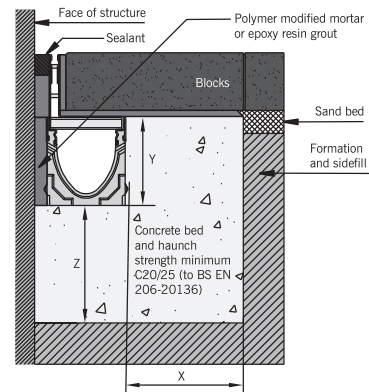
CHANNELS WITH BRICKSLOT GRATINGS

Block pavement

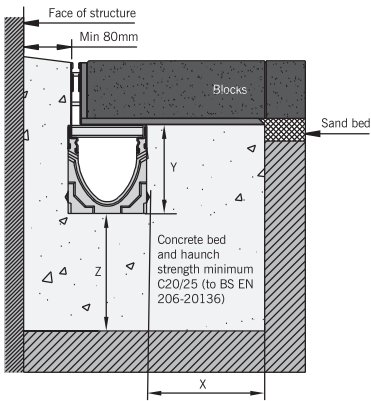


An electronic version of the ACO MultiDrain® MD installation detail is available to download from the ACO website. Visit www.aco.co.uk.

Adjacent to a structure - option 3



Adjacent to a structure - option 4



10.0 Watertight installation to BS EN 1433:2002

Where ACO channel joints/fittings and channel/pavement interfaces are to be sealed, an appropriate sealant must be used (e.g., Silkaflex 11FC or similar). Guidance on the necessary surface preparation and/or priming should be sought from the sealant manufacturer.

See page 46 for typical method of water tight sealing.

Best practice and workmanship

ACO can give guidance with respect to the most suitable methods of installation for each of the products in the ACO MultiDrain® MD range. ACO MultiDrain® MD should be installed using acceptable levels of workmanship and according

to the National Code of Practice (UK: BS8000: Part 14: 1989) in keeping with EN 1433:2002 (Drainage channels for vehicular and pedestrian areas).

Detailed installation statements and methodologies will vary for all sites as each will have different aspects deserving particular consideration, consequently the relevant approvals should be sought from the consulting engineer and/or the installer.

Note: Galvanised iron and steel products have good corrosion resistance to concrete and mortar products but may experience corrosion if high chloride an/or sulphate content is present. Use only good quality concrete and consider using corrosion inhibitors where necessary. The use of protective coatings, such as paint, can minimise the risk of corrosion.

11.0 Minimum Dimensions of Concrete Surround

Load Class	A 15	B 125	C 250	D 400*
Minimum Dimensions (mm)				
x	100	150	150	200
y	Full channel height (less Y2 where necessary)			
z	15 100 0	150	150	200
Y2	35	35	35	35
Maximum Dimensions (mm)	35	35	35	35
Asphalt pavement only	Y3	100	60	60

*E.g., Parking areas for all types of road vehicle. Not suitable for carriageways of public roads or motorways.



For further information please contact our Design Services Team (technical@aco.co.uk) or the ACO website www.aco.co.uk

Chemical resistance chart

Vienite®, ACO's sustainable high strength material, has a high resistance to dilute acids and alkalis, and are unaffected by road salt, fuel and oil, and other commonly encountered chemicals. Further details of the chemical resistance can be obtained from the ACO Water Management Design Services team or, for particular chemicals, samples of the polymer concrete can be supplied to customers for their own testing. The chemical resistance will also depend on the temperature of the effluent. Clean water should not exceed 80°C.

The resistance of the gratings and edge rails should also be considered, and stainless steel gratings and edge rails are available in the ACO MultiDrain® MD system for aesthetically pleasing installations and for specific chemical resistance.

This chemical resistance chart refers to chemicals at ambient temperatures (20°C) and the results are for general guidance only.

Chemical medium	% conc	Resistance: Polyester concrete
Acetic acid, glacial	100	No
Acetic acid	10	Yes
Acetic anhydride	100	No
Acetone	10	No
Acetone	100	No
Alum	100	Yes
Aluminium sulphate	100	Yes
Ammonium chloride	100	Yes
Ammonium nitrate	100	Yes
Ammonium phosphate	65	Yes
Ammonium sulphate	100	Yes
Aniline (aminobenzene)	100	No
Barium chloride	100	Yes
Benzaldehyde	100	No
Benzene	100	No
Benzyl alcohol	100	Yes
Benzyl chloride	100	No
Borax	100	Yes
Boric acid	100	Yes
Bromine	100	No
Bromine water	Saturated	No
Butyl acetate	100	No
Butyric acid	100	Yes
Calcium carbonate	100	Yes
Calcium chloride	100	Yes
Calcium chlorate	8	Yes
Calcium hydroxide	100	Yes
Calcium nitrate	100	Yes
Carbon disulphide	100	No
Carbon tetrachloride	100	Yes
Castor oil	100	Yes
Chlorine gas, wet	100	No
Chlorine water	Saturated	No
Chlorobenzene	100	Yes
Chloroform (trichloro-methane)	100	No
Chromic acid	12	Yes
Citric acid	100	Yes
Copper chloride	100	Yes
Copper nitrate	100	Yes
Cyclohexane	100	Yes
Diesel fuel (DERV)	100	Yes
Dimethyl formamide	100	No
Dimethyl phthalate	100	Yes
Diethyl phthalate	100	Yes
Ethanol	95	No
Ethanolamine	100	Yes
Ethyl acetate	100	No
Ethylene glycol	100	Yes
Ferrous chloride	100	Yes
Ferric chloride	100	Yes
Ferrous sulphate	100	Yes
Formaldehyde	30	Yes
Formic acid	10	Yes
Formic acid	100	No
Fuel oil	100	Yes
Gasoline	100	Yes
Glycerine	100	Yes
Hydrazine	50	No

Chemical medium	% conc	Resistance: Polyester concrete
Hydrobromic acid	48	Yes
Hydrochloric acid	10	Yes
Hydrofluoric acid	10	No
Hydrogen peroxide	30	Yes
Lactic acid	100	Yes
Lead acetate	100	Yes
Magnesium chloride	100	Yes
Magnesium sulphate	100	Yes
Maleic acid	100	Yes
Methyl ethyl ketone (MEK)	100	No
Motor oil	100	Yes
Nickel chloride	100	Yes
Nickel sulphate	100	Yes
Nitric acid	5	No
Nitrobenzene	100	No
Oleic acid	100	Yes
Oxalic acid	100	Yes
Perchloric acid	10	Yes
Perchloroethylene	100	Yes
Phosphoric acid	20	Yes
Phosphorus trichloride	100	No
Potassium carbonate	50	Yes
Potassium chloride	100	Yes
Potassium dichromate	100	Yes
Potassium hydroxide	10	Yes
Potassium nitrate	100	Yes
Potassium permanganate	10	No
Potassium sulphate	100	Yes
Pyridine	100	No
Sodium acetate	100	Yes
Sodium bromide	100	Yes
Sodium carbonate	35	Yes
Sodium chlorate	100	Yes
Sodium chloride	100	Yes
Sodium hydroxide (caustic soda)	50	No
Sodium hypochlorite	18	No
Sodium nitrate	100	Yes
Sodium nitrite	100	Yes
Sodium phosphate	10	Yes
Sodium sulphate	100	Yes
Sodium sulphide	100	Yes
Sodium sulphite	100	Yes
Sodium thiosulphate	100	Yes
Stearic acid	100	Yes
Styrene	100	No
Sulphuric acid	75	No
Sulphuric acid	50	Yes
Sulphuric acid at up to 40°C	10	Yes
Tetrachloroethylene	100	Yes
Thioglycolic acid	80	Yes
Thionyl chloride	100	No
Toluene	100	Yes
Toluene sulphononic acid (aqueous solution)	Saturated	Yes
Trichloroacetic acid	50	Yes
Turpentine	100	Yes
Water	100	Yes
Xylene	100	Yes
Zinc sulphate	100	Yes

Specification clause

The surface drainage system shall be ACO MultiDrain® (Insert channel description as appropriate e.g. ACO M100D) channel system as supplied by ACO Technologies plc; all materials and components within the scope of this channel system shall be obtained from this manufacturer. The system shall be CE marked and fully compliant with BS EN 1433:2002, certificated to Load Class (*) as defined in BS EN 1433:2002.

Declarations of Performance (DoP) shall be supplied to the Supervising Officer upon request. The system shall be of (100mm†, 150mm†, 200mm†) nominal internal width, manufactured in Vienite®, ACO's sustainable high strength material with cast-in (galvanised/stainless†) steel edge rails. The channels shall be installed with manufacturer's grating appropriate to the specified Load Class and locked securely in place using the manufacturer's Drainlock® boltless locking system.

The system shall be installed in accordance with the manufacturer's printed instructions, and the work carried out as specified in drawing no. (... ..) and in accordance with recognised good practice. Standards of workmanship shall generally be as specified in BS EN 752 and BS 8000:Part 14:1989.

† delete non-appropriate information.

* insert information C 250 or D 400 as appropriate.

Recycled content

ACO Technologies aim to incorporate as much recycled material or waste material as is practicable in their manufactured products. Typically, cast iron materials contain 40% to 90 % recycled iron, and steel products contain 25% to 33% recycled steel. The total recycled content of each product in the ACO MultiDrain® MD system will vary as the proportion of the different materials (in channels, edge rails, gratings etc) varies. As an example, ACO MultiDrain® MD channels with Heelguard™ ductile iron gratings will contain approximately 27% by weight recycled material.

The ACO MultiDrain® MD products are themselves intended for a long life with low maintenance, to reduce the need to recycle, but when eventually they are no longer needed, much of their content can be readily recycled with a very low risk of pollution to the environment.

NBS Specifications

ACO MultiDrain® MD should be specified in section Q10:180. Assistance in completing this clause can be found in the ACO Water Management entry in NBS Plus, or please contact the ACO Water Management Design Services Team.

Note: A specification in NBS format is available to download from www.thenbs.com or www.aco.co.uk

Conformity

The ACO MultiDrain® MD System is fully certified to BS EN 1433:2002 and CE marked in accordance with the Construction Products Regulation.

Declarations of Performance are available via the CPR Zone on our website (www.aco.co.uk), or on request. Please contact ACO Water Management Design Services Team on 01462 816666 for further information.

BS EN 1433:2002



General information

ACO products are subject to weight and dimensional tolerances. The weights and dimensions shown in this document are for guidance purposes only. ACO products are made from naturally occurring materials and may be subject to variations in colour, texture and marking. These aesthetic variations do not affect the performance or functionality of our Goods. The appearance of products shown in our company documentation are for illustration purposes only.

ACO Technologies plc

- ACO Water Management
Civils + Infrastructure
Building + Landscape
- ACO Building Drainage
- ACO Sport
- ACO Wildlife



ISO 9001
FM 13502



ISO 14001
EMS 538781



OHSAS 18001
OHS 524145

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ACO. creating the future of drainage

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