

# ACO Water Management: Civils + Infrastructure

|                   |               |
|-------------------|---------------|
| Uniclass<br>L7315 | EPIC<br>J3413 |
| Cl/SfB<br>(52.5)  |               |

ACO MultiDrain® PPD



*ACO MultiDrain® PPD system*

**Medium duty channel drainage system**



# Introduction to the ACO Group

Throughout the world ACO branded drainage and surface water management systems are recognised for their innovative design, high quality manufacture, environmental excellence and industry leading performance.

Today the ACO Group has a research and production base that reaches across four continents. This unmatched resource pioneers the development of solutions that are tailored to individual applications, meeting the need for high performance, sustainable products that deliver optimum value throughout their operational life.

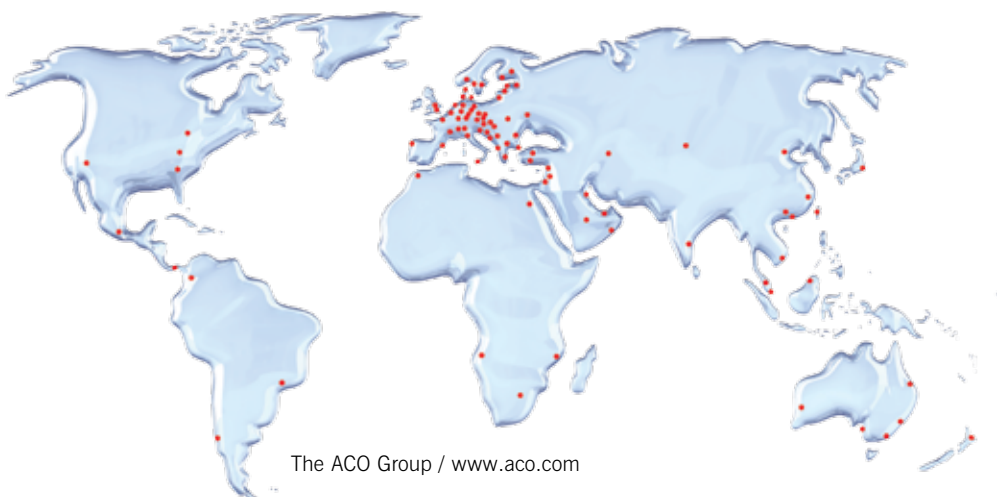
## ACO Technologies plc

ACO operates as ACO Technologies plc in the United Kingdom. Founded over 30 years ago, the company has grown quickly on a reputation for design innovation and customer service.

There are now 2 divisions within ACO Technologies that serve every sector of the construction industry, providing solutions for applications as diverse as rail, highways, airports, landscaping, retail, distribution centres and environmentally sensitive projects.



To help architects, designers and contractors meet the legal requirements that now tightly control the way surface water is managed, ACO has created its unique 'Surface Water Management Cycle' – Collect, Clean, Hold, Release – the four core processes now required for the complete and sustainable management of surface water drainage.



# Contents

|   |    |
|---|----|
| Introduction to ACO MultiDrain® PPD                             | 4  |
| Channel range layout  | 6  |
| Features overview   | 8  |
| Grating styles  | 10 |
| <hr/>   |    |
| <b>ACO MultiDrain® M100PPD</b>                                  |    |
| ACO MultiDrain® M100PPD channels with galvanised edge rails     | 12 |
| ACO MultiDrain® M100PPD accessories                             | 12 |
| ACO Universal Gully   | 14 |
| ACO MultiDrain® M100PPD traditional gratings and Brickslot tops | 16 |
| <hr/>   |    |
| <b>ACO MultiDrain® M150PPD</b>                                  |    |
| ACO MultiDrain® M150PPD channels with galvanised edge rails     | 18 |
| ACO MultiDrain® M150PPD accessories                             | 18 |
| ACO MultiDrain® M150PPD traditional gratings and Brickslot tops | 20 |
| <hr/>   |    |
| <b>ACO MultiDrain® M200PPD</b>                                  |    |
| ACO MultiDrain® M200PPD channels with galvanised edge rails     | 21 |
| ACO MultiDrain® M200PPD accessories                             | 21 |
| ACO MultiDrain® M200PPD traditional gratings                    | 23 |
| <hr/>   |    |
| <b>ACO MultiDrain® PPD: Problem solving solutions</b>           |    |
| Discrete slot drainage  | 24 |
| Preparing the system for installation                           | 29 |
| Designing an ACO MultiDrain PPD® drainage system                | 32 |
| Design method   | 33 |
| Hydraulic performance tables                                    | 34 |
| Installation detail   | 36 |
| Chemical resistance chart                                       | 38 |
| Specification clause/recycled content/CE conformity             | 39 |



# Introduction to ACO MultiDrain® PPD

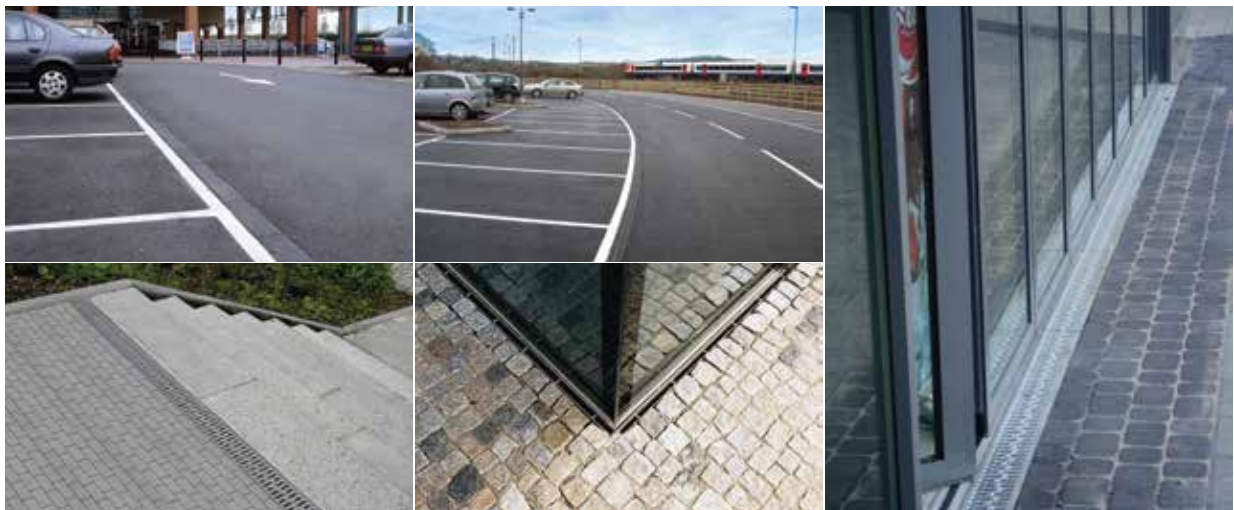
The new ACO MultiDrain® PPD channel and grating system provides versatile and efficient linear drainage for infrastructure and hard landscaping projects.

## What is ACO MultiDrain® PPD?

ACO MultiDrain® PPD 1m constant depth channel elements are available in 3 widths: 100mm, 150mm and 200mm. This gives the designer the means to select the optimum channel size and hydraulic performance required, minimising the number of outlets and keeping installation costs as low as possible.

An extensive choice of grating styles, materials and load classes is available fitted with the ACO Drainlock™ fastening system, which provides simple and quick installation yet prevents traffic displacing the gratings. If there is a risk of unwanted grating removal or theft then security locking systems are available.

Where slot drainage is preferred ACO Brickslot tops are available for the 100mm and 150mm wide channels, providing discreet slot drainage in either block paving or natural stone surfaces. The offset drainage slot also enables ACO Brickslot to be used right up to building façades or for threshold drainage.



4



## Typical applications

The ACO MultiDrain® PPD system can provide a channel drainage solution for many applications by selecting the appropriate channel width, depth and grating type. Typical applications include:

- ▶ Threshold drainage
- ▶ Public landscaping
- ▶ Car parking
- ▶ Light industrial
- ▶ HGV parking
- ▶ Petrol station forecourts
- ▶ SuDS



If you need help with specification, design or installation, or just wish to learn more about this and other Surface Water Management products from ACO, contact our free, no obligation ACO Water Management Design Services Team who can provide advice and dedicated design support for your project – 01462 816666 or visit [www.aco.co.uk](http://www.aco.co.uk).

# Why choose ACO MultiDrain PPD?

The system meets the highest standards for performance and quality, being fully compliant with and independently certified to BS EN 1433:2002 for applications ranging from A 15 up to and including D 400\*, ideal for pedestrians, cars, service vehicles or HGV traffic.

The constant depth 1m recycled polypropylene channels with protective galvanised steel edge rails are extremely robust and durable yet all weigh under 5kg thanks to ACO's unique HexTechnology™ channel structure. ACO MultiDrain® PPD has the performance to withstand the rigours of installation and provide long service life.

Installation and maintenance costs are kept to a minimum with each channel packed with labour saving features, such as clip together end details for rapid channel connection and alignment, knockout panels for outlet pipe work, and the 'V' shaped channel bore that promotes self cleansing. Guidance on preparation, installation and maintenance of this system is given in the ACO MultiDrain® PPD installation manual or visit [www.aco.co.uk](http://www.aco.co.uk).



## System benefits

- ▶ Range of sizes and depths suits many drainage designs
- ▶ Strong, robust channel unit
- ▶ Galvanised edge rail for improved installed strength
- ▶ 100% recyclable
- ▶ Extensive choice of gratings and accessories
- ▶ Easily cut to 500mm lengths
- ▶ Unique ACO Drainlock™ grating fixing improves hydraulic capacity
- ▶ CE marked and fully certified to BS EN 1433:2002 Load Class D 400\*
- ▶ Efficient surface water drainage for a wide variety of applications
- ▶ Channel design improves flow velocity, promotes self cleansing
- ▶ Lightweight design is simple and fast to install



## ACO Hydraulic Design Software

Register online for our free, secure online design software:

- ▶ All designs are securely stored and easily accessed online
- ▶ Data always up-to-date
- ▶ Proven calculation methodology - more accurate and efficient designs
- ▶ Flexible catchment design
- ▶ Integrated rainfall data
- ▶ Automated product optimisation
- ▶ PDF summary documents



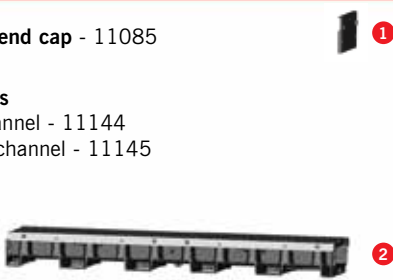



**Register Now - It's Free**  
[www.acodesign.co.uk](http://www.acodesign.co.uk)

\*Not suitable for carriageways of public roads or motorways



## ACO MultiDrain® PPD range layout

The layout diagram below illustrates the channels and accessories available within the ACO MultiDrain® PPD range. Numerical product codes are provided after the product description for quick reference e.g. ❶ Closing end cap – 11085.

| ACO MultiDrain® M100PPD shallow constant depth components   | ACO MultiDrain® M100PPD constant depth components   |
|---|---|
| <p>❶ Closing end cap - 11085</p> <p>❷ Channels<br/>075 channel - 11144<br/>0100V channel - 11145</p>   | <p>❶ Closing end cap - 11086</p> <p>❷ Channel<br/>0.0J channel - 11140</p>  |
| <p>❸ Outlet connectors<br/>Ø110mm connector - 11285<br/>Ø160mm connector - 11286</p>   |   |
| <p>❹ Sump unit* - 11385</p>   |   |
| <p>❺ Foul air traps<br/>Ø110mm foul air trap - 11191<br/>Ø160mm foul air trap - 11192</p>   |   |
| <p><b>Guidance for using the ACO MultiDrain® PPD parts tables</b></p> <p>The ACO MultiDrain® PPD parts tables are shown on the forthcoming pages. The product information is split down by channel widths. This enables quick and simple product identification and selection.</p> <p>All channels within the ACO MultiDrain® PPD range are constant depth units.</p> |   |

\* Sump unit connects to channel via Ø160mm outlet connector which is provided as part of the sump assembly.  
\*\* Sump unit connects to channel via Ø200mm outlet connector which is provided as part of the sump assembly

**ACO MultiDrain® M150PPD  
constant depth components**

**1** Closing end cap - 11093



**2** Channels  
0.0J channel - 11151



**3** Outlet connector  
Ø160mm connector - 11288



**4** Sump unit\* - 11386

**5** Foul air traps  
Ø110mm foul air trap - 11191  
Ø160mm foul air trap - 11192



**ACO MultiDrain® M200PPD  
constant depth components**

**1** Closing end cap - 11098



**2** Channels  
0.0J channel - 11158



**3** Outlet connectors  
Ø200mm connector - 11289



**4** Sump unit\*\* - 11387

**5** Foul air traps  
Ø160mm foul air trap - 11192



**6** ACO Universal Gully  
Gully assembly and bucket - 33401  
Gully assembly no bucket - 33402

For use on all ACO MultiDrain® PPD systems.



ACO MULTIDRAIN PPD FEATURES OVERVIEW



ACO MultiDrain® PPD gratings are fitted with the ACO Drainlock™ fastening system for quick installation



Anti shunt feature holds grating securely in place



Security locking option available to restrict unwanted grating removal

Durable galvanised steel edge rail protects channel from traffic damage

Channels clip together easily

Sealant groove for simple watertight installations

V shaped channel bore improves speed of water flow and promotes self cleansing

Environmentally friendly product – manufactured from recycled polypropylene and 100% recyclable

Constant depth channels are provided with a 90° channel connection

LOAD CLASSES



**A 15**  
Pedestrian, cycleways, minimally trafficked areas (light domestic vehicles only).



**B 125**  
Pedestrian precincts, car parks and drives.



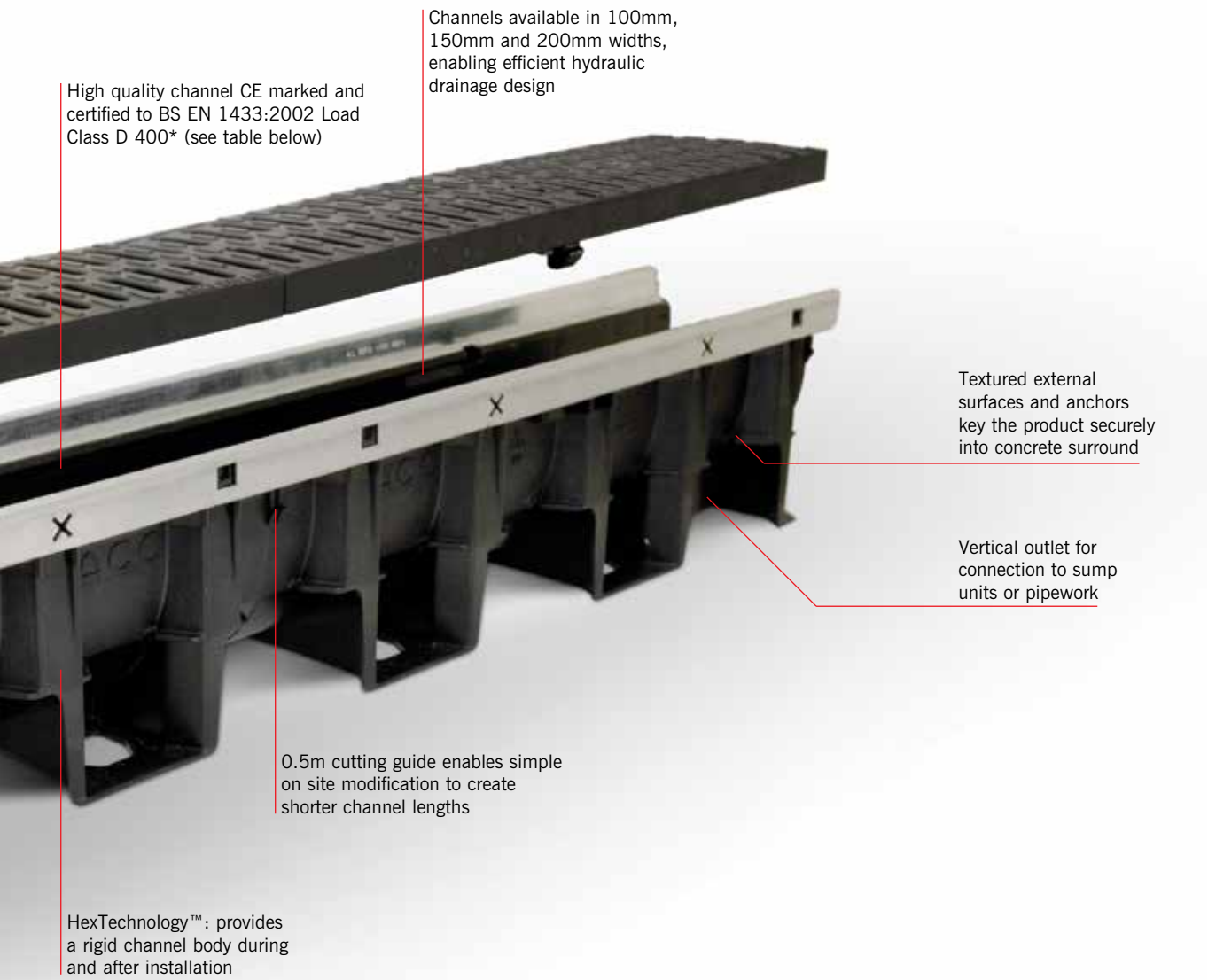
**C 250**  
Parking areas, service stations (cars) and slow-moving light commercial vehicles.



**D 400**  
Parking areas for all types of vehicles\*

\*Not suitable for carriageways of public roads or motorways





**Gratings**

ACO MultiDrain® PPD System has a wide variety of gratings available that include cast iron, stainless steel and plastic slotted gratings, heelguard options (including the new ATec coated heelguard grating), solid covers and brickslot gratings. See pages 10 and 11 for further details.

# EXPLORE THE WORLD'S LARGEST RANGE OF GRATING STYLES

Style, aesthetics, performance and reliability are all important factors when specifying surface water management systems. Globally recognised as the no. 1 choice in managing surface water, ACO provide designers with the widest range of channel and grating styles to choose from.

By using a range of different design options including light, form, texture, material and colour, ACO's grating and channel styles can be used to complement or enhance many landscape designs.



## Multi applications provided for by ACO MultiDrain® PPD

The breadth of the ACO MultiDrain grating range provides designers with a wide choice of styles to complete their surface water drainage system.

Depending on the application requirement, Architects, Designers and Planners can choose from variety of popular, long establish designs in ductile iron, high tech composites of galvanised steel materials.

For applications which require discreet drainage to blend subtly with the design of the landscape, ACO Brickslot can provide an aesthetically-pleasing finish.

Supplied as standard with ACO Drainlock boltless locking, the range of grating styles is available in load classes A 15 – D 400 making them the idea choice for both pedestrian and vehicular applications.

To suit a range of hydraulic requirements, these grating styles are available for use with 100mm, 150mm and 200mm wide channels.

10  
■■■



Technical information for these gratings is provided on page 15 onwards

## Lighting & bespoke solutions

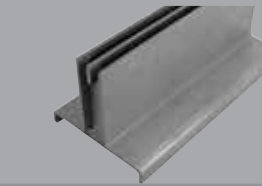
### Lighting Solutions

Enhance and add definition to a space - see ACO Lighting Systems brochure for details.



### Bespoke Slot Solutions

Our Brickslot gratings can be provided in a range of bespoke heights and widths. Contact our Design Services Team for details.



### Bespoke Freestyle Solutions

Realise your own design ideas. ACO Freestyle cast iron gratings offer you individual solutions for every project. Contact our design services team for more details.



## 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](http://www.aco.co.uk/gratingvisualiser)

## New grating styles

A new range of contemporary, elegant designs will add character and style to any landscape project.

### Intercept Profile Galvanised steel



High quality linear profile design provides a stylish option for those looking for an alternative to stainless steel.

### Heelguard™ Mesh Galvanised Steel



The stylish tight mesh design has special Heelguard™ technology for pedestrian safety.'

### Mosaic



The unique pattern of the Mosaic design provides an ideal finish to heritage or traditional landscapes.

### Leaf



The leaf grating can provide a pleasing alternative design to many urban landscape designs.

### Flag



The unusual character of the Flag design provides a fun alternative to traditional slotted gratings.



### Gratings

ACO MultiDrain® PPD System has a wide variety of gratings available that include cast iron, stainless steel and plastic slotted gratings, heelguard options (including the new ATec coated heelguard grating), solid covers and brickslot gratings.



# ACO MultiDrain® M100PPD channels with UltraSTEEL™ galvanised edge rails

ACO MultiDrain® M100PPD channels are manufactured from recycled polypropylene and are 100% recyclable.

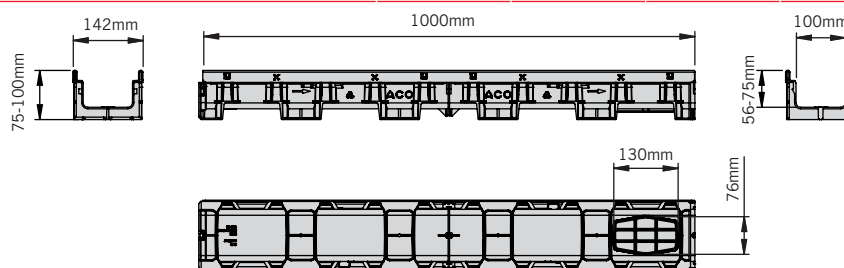
ACO MultiDrain® M100PPD channels listed below are provided with integral galvanised steel protective edge rails. For enhanced durability these rails are manufactured from UltraSTEEL™, a unique material that has improved strength over plain steel.

The added benefit of UltraSTEEL™ is that its greater surface area improves the bond between rail and adjacent material where a sealed system is required.

For the ACO MultiDrain® M100PPD range of gratings to suit these channels please refer to page 16.

## Shallow constant depth channels with UltraSTEEL™ galvanised edge rails

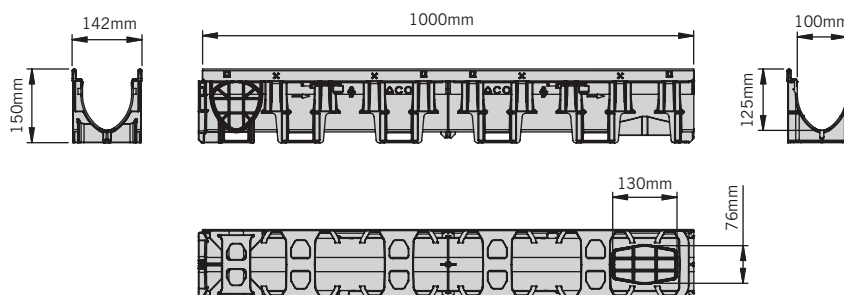
| Product code | Description       | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|-------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11144        | M100PPD No. 075*  | 1000        | 142                | 75                 | 56                | 2.6         |
| 11145        | M100PPD No. 0100* | 1000        | 142                | 100                | 75                | 2.9         |



M100PPD 075 – 0100 1m shallow depth channel

## Constant depth channel with UltraSTEEL™ galvanised steel edge rails

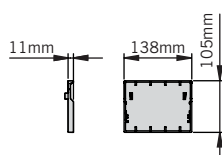
| Product code | Description       | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|-------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11140        | M100PPD No. 0.0J* | 1000        | 142                | 150                | 125               | 3.5         |



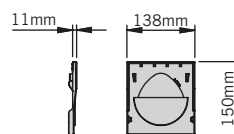
M100PPD 1m constant depth channel

## Universal closing end cap

| Product code | Description                                       | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|-------------------|-------------|
| 11085        | M100PPD shallow channel universal closing end cap | 11          | 138                | 105                | -                 | 0.1         |
| 11086        | M100PPD universal closing end cap                 | 11          | 138                | 150                | -                 | 0.1         |



M100PPD shallow channel universal closing end cap



M100PPD universal closing end cap

J Indicates side knockout for 90° channel connection. Knockout on both sides of the channel.

\* Indicates channels supplied with vertical outlet knockout for use with Ø160mm outlet connectors. Outlet connectors supplied separately, see table above for details.

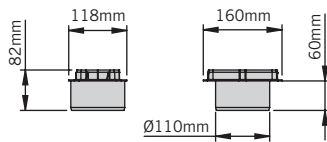
***These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.***



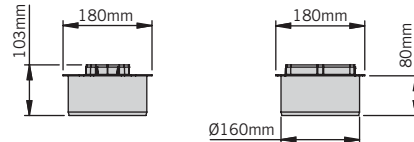
# ACO MultiDrain® M100PPD components

## Outlet connectors

| Product code | Description                      | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|----------------------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11285        | Ø110mm vertical outlet connector | -           | Ø110               | 60                 | -                 | 0.1         |
| 11286        | Ø160mm vertical outlet connector | -           | Ø160               | 80                 | -                 | 0.1         |



M100PPD Ø110mm vertical outlet connector  
 Max flow from channel 075 = 4.8 l/s  
 0100 = 5.5 l/s  
 0.0 = 7.1 l/s



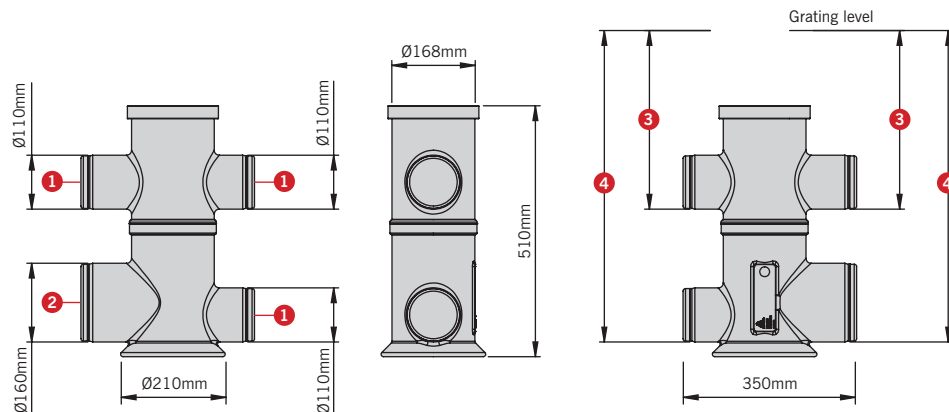
M100PPD Ø160mm vertical outlet connector  
 Max flow from channel 075 = 6.1 l/s  
 0100 = 7.1 l/s  
 0.0 = 9.2 l/s

## M100PPD sump unit

| Product code | Description  | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|-------------------|-------------|
| 11385        | Black plastic sump unit with plastic silt bucket and Ø160mm outlet connector | 350         | Ø210               | 510                | -                 | 3.0         |

Standard sump outlets

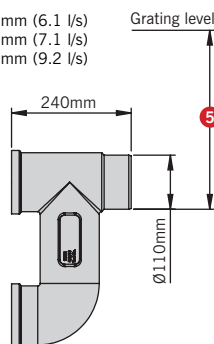
- 1 = Ø110mm outlet
- 2 = Ø160mm outlet
- 3 = Invert depth including channel:  
 075 = 287mm (6.1 l/s)  
 0100 = 312mm (7.1 l/s)  
 0.0 = 362mm (9.2 l/s)
- 4 = Invert depth:  
 075 = 557mm (6.1 l/s)  
 0100 = 582mm (7.1 l/s)  
 0.0 = 632mm (9.2 l/s)



## Foul air trap

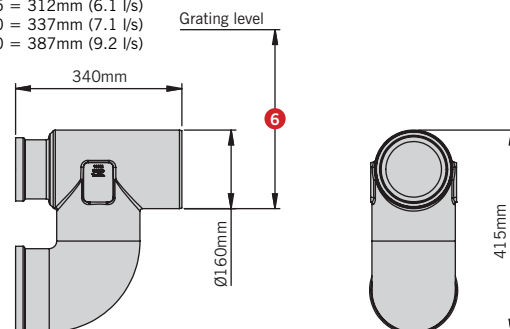
| Product code | Description          | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|----------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11191        | Ø110mm foul air trap | 240         | Ø110               | 400                | 422               | 1.2         |
| 11192        | Ø160mm foul air trap | 340         | Ø160               | 415                | 447               | 1.4         |

- 5 = Invert depth:  
 075 = 287mm (6.1 l/s)  
 0100 = 312mm (7.1 l/s)  
 0.0 = 362mm (9.2 l/s)



Roddable foul air trap LLDPE Ø110mm

- 6 = Invert depth:  
 075 = 312mm (6.1 l/s)  
 0100 = 337mm (7.1 l/s)  
 0.0 = 387mm (9.2 l/s)



Roddable foul air trap LLDPE Ø160mm

Note: For ACO Universal Gully details please refer to page 14.

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



Accessories

| Product code | Description                 | Weight (kg) |
|--------------|-----------------------------|-------------|
| 32599        | Polymer concrete repair kit | 1.0†        |

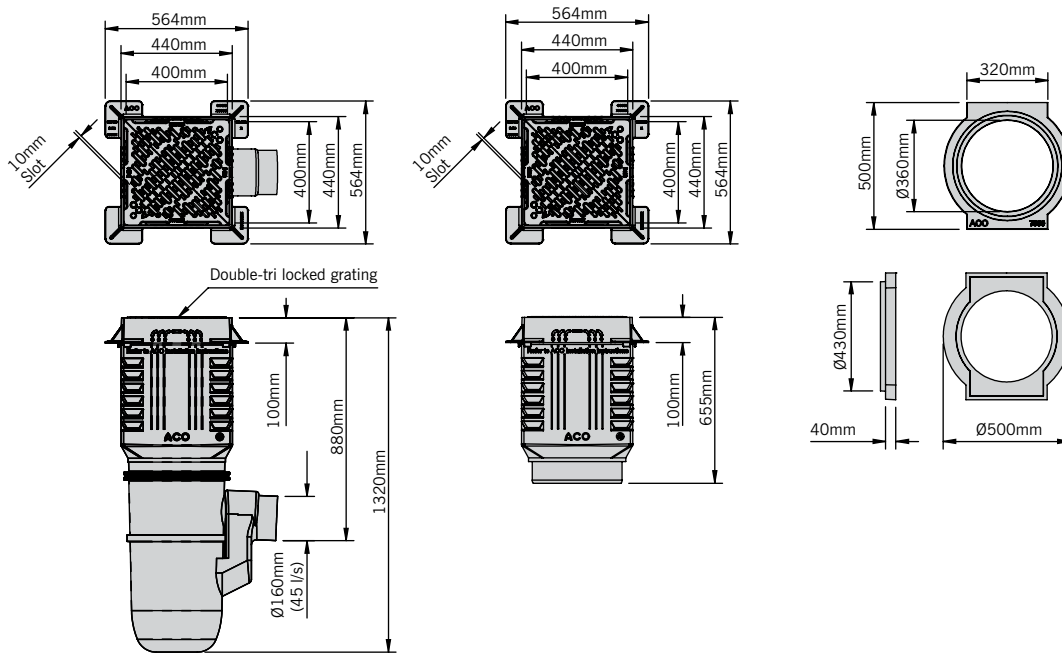


†Repair kit includes 0.5kg tin of natural colour polyester concrete repair resin, grey and black pigment, hardener paste, mixing instructions and material safety data sheets.



Universal gully and components

| Product code | Description                    | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Invert Type | Weight (kg) |
|--------------|--------------------------------|-------------|--------------------|--------------------|-------------------|-------------|-------------|
| 33401        | Gully assembly and bucket 601D | 440         | 440                | 1315               | 870               | -           | 52.5        |
| 33402        | Gully assembly no bucket 602D  | 440         | 440                | 1315               | 870               | -           | 51.0        |
| 33407        | Gully top assembly 607D        | 440         | 440                | 655                | -                 | -           | 45.0        |
| 33605        | Gully base unit 605            | -           | Ø375               | 750                | 310               | -           | 4.3         |
| 33603        | Gully intermediate unit 603    | 440         | 440                | 515                | -                 | -           | 5.1         |
| 44355        | Gully grating and frame 600D   | 400*        | 564††              | 100                | -                 | -           | 40.0        |
| 7060         | Gully connector 615            | 500         | Ø500               | 40                 | -                 | -           | 7.0         |
| 33606        | Bucket polyethylene 606        | -           | Ø275               | 245                | -                 | -           | 1.4         |



Product code: 33401 and 33402

Product code: 33407

Product code: 7060

Note. Plain U-PVC 150mm - 160mm Supersleeve adaptor supplied with 601D, 602D and 605 assemblies. For information on universal gully functionality see page 31. \*Clear opening size. ††Over frame size.

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



# ACO Drainlock™ Gratings

Fitted as standard to ACO MultiDrain® PPD gratings, ACO Drainlock™ is a fastening system which removes the need for bolts and bars and improves the channel's hydraulic capacity. The ACO Drainlock™ mechanism simply clips into the channel for rapid installation. Some gratings are also fitted with an anti-shunt mechanism that restricts unwanted grating movement when installed.

The load class application of the channel system once installed, is determined by the load class of the gratings fitted e.g. Load Class C 250 gratings fitted to a ACO MultiDrain® PPD channel equals C 250 channel system.

## ACO Drainlock™ security locking system

In areas such as schools and prisons, where unwanted grating removal needs to be restricted, the ACO Drainlock™ security locking system can be used in conjunction with a number of gratings\*.

The system is fitted to the gratings by two M6 security screws, and clamps the grating in place preventing removal. Security locking key for installation and removal supplied separately.

## Fitting the grating



**Step 1:** Place the grating onto the channel making sure that the anti shunt detail is aligned within the recess.



**Step 2:** Push or stand on the grating until the ACO Drainlock™ locking device clips into the channel.

## Security locking



**Step 1:** Fix the M6 security screws and clamp to the grating as shown in the image above.



**Step 2:** Place grating into the channel and tighten the screws using the security locking key.

## Removal of the grating



Insert tool as shown and pull upwards to unlock grating. Drainlock™ lifting tool available, part no 1367.



Heelguard™ applies to ACO's 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.



# Gratings for use with ACO MultiDrain® M100PPD channels with UltraSTEEL™ galvanised edge rails

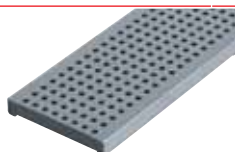


## Gratings for Load Class A 15 applications

| Product code | Description                         | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|-------------------------------------|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 12610        | Slotted galvanised steel 400DL      | 1000        | 123                | 21                 | 10                        | Yes        | 25300                            | n/a                | 2.0         |
| 12611        | Slotted galvanised steel 402DL      | 500         | 123                | 21                 | 10                        | Yes        | 25300                            | n/a                | 1.0         |
| 12666        | Perforated galvanised steel 12666DL | 1000        | 123                | 21                 | 6                         | Yes        | 16300                            | n/a                | 2.6         |
| 12667        | Perforated galvanised steel 12667DL | 500         | 123                | 21                 | 6                         | Yes        | 16300                            | n/a                | 1.3         |



400DL / 402DL  
Slotted galvanised steel



12666DL / 12667DL  
Perforated galvanised steel



## Gratings for Load Class B 125 applications

| Product code | Description                                 | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 132555       | Intercept Profile galvanised steel 132555DL | 1000        | 123                | 21                 | 29 x 8                    | Yes        | 44500                            | Yes                | 4.1         |
| 132550       | Intercept Profile galvanised steel 132550DL | 500         | 123                | 21                 | 29 x 8                    | Yes        | 44500                            | Yes                | 2.0         |



132555DL / 132550DL  
Intercept Profile galvanised steel

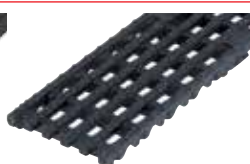


## Traditional gratings for Load Class C 250 applications

| Product code | Description                                    | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 132720       | Heelguard™ composite - black 522DL <b>6</b>    | 500         | 123                | 21                 | 8                         | Yes        | 28500                            | Yes                | 1.0         |
| 12673        | Intercept ductile iron 507DL                   | 500         | 123                | 21                 | 31 x 12                   | No         | 40100                            | Yes                | 3.7         |
| 12614        | Slotted galvanised steel 423DL                 | 1000        | 123                | 21                 | 10                        | Yes        | 25300                            | n/a                | 5.0         |
| 12615        | Slotted galvanised steel 424DL                 | 500         | 123                | 21                 | 10                        | Yes        | 25300                            | n/a                | 2.5         |
| 12656        | Perforated galvanised steel 12656DL            | 1000        | 123                | 21                 | 6                         | Yes        | 16300                            | n/a                | 4.8         |
| 12657        | Perforated galvanised steel 12657DL            | 500         | 123                | 21                 | 6                         | Yes        | 16300                            | n/a                | 2.4         |
| 132880       | Heelguard™ mesh galvanised steel grating 410DL | 1000        | 123                | 21                 | 29 x 9.5                  | Yes        | 80000                            | Yes                | 4.2         |
| 132881       | Heelguard™ mesh galvanised steel grating 412DL | 500         | 123                | 21                 | 29 x 9.5                  | Yes        | 80000                            | Yes                | 2.1         |



522DL  
Heelguard™ composite



507DL  
Intercept ductile iron



423DL / 424DL  
Slotted galvanised steel



12656DL / 12657DL  
Perforated galvanised steel



410DL / 412DL  
Mesh galvanised steel

**6** Indicates security locking available.

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





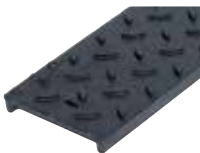


## Gratings for Load Class D 400\* applications

| Product code | Description                               | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm²/m) | Anti shunt feature | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|---------------------------|------------|---------------------|--------------------|-------------|
| 23405        | Heelguard™ ductile iron 23405DL <b>6</b>  | 500         | 123                | 21                 | 8                         | Yes        | 23900               | Yes                | 4.1         |
| 23406        | Ductile iron solid cover 23406DL          | 500         | 123                | 21                 | n/a                       | No         | n/a                 | Yes                | 4.5         |
| 23408        | Slotted ductile iron 23408DL              | 500         | 123                | 21                 | 12                        | No         | 35700               | Yes                | 3.8         |
| 132042       | Flag ductile iron 132042DL                | 500         | 123                | 21                 | 8                         | Yes        | 30400               | Yes                | 4.9         |
| 132043       | Leaf ductile iron 132043DL                | 500         | 123                | 21                 | 10                        | Yes        | 34700               | Yes                | 4.7         |
| 132885       | Heelguard™ mesh galvanised steel 132885DL | 1000        | 123                | 21                 | 28 x 8.5                  | Yes        | 69100               | Yes                | 5.1         |
| 132886       | Heelguard™ mesh galvanised steel 132886DL | 500         | 123                | 21                 | 28 x 8.5                  | Yes        | 69100               | Yes                | 2.5         |



23405DL  
Heelguard™ ductile iron



23406DL  
Ductile iron solid cover



23408DL  
Slotted ductile iron



132042DL  
Flag ductile iron



123043DL  
Leaf ductile iron



132885DL/132886DL  
Heelguard™ mesh galvanised steel

## ACO ATec high performance finish



### Gratings for Load Class D 400\* applications with ACO ATec corrosion resistant coating

| Product code | Description  | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm²/m) | Anti shunt feature | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|---------------------|--------------------|-------------|
| 23409        | ATec coated Heelguard™ ductile iron 23409DL <b>6</b> | 500         | 123                | 21                 | 8                         | 23900               | Yes                | 4.1         |
| 23417        | ATec coated Mosaic ductile iron 23417DL <b>6</b>     | 500         | 123                | 21                 | 10                        | 28000               | Yes                | 4.1         |



23409DL  
Heelguard™ ductile iron



23417  
Mosaic ductile iron



ACO ATec coating is a high performance finish designed for the most demanding of environments. The black corrosion resistant coating provides a strong durable finish which maintains the overall aesthetics of the grating. ACO ATec provides up to 10 times longer protection against corrosion than standard water-based surface coatings

## Grating accessories

| Product code | Description                         | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Invert Type | Weight (kg) |
|--------------|-------------------------------------|-------------|--------------------|--------------------|-------------------|-------------|-------------|
| 23415        | Drainlock™ security locking system  | n/a         | n/a                | n/a                | n/a               | n/a         | 0.1         |
| 23416        | Drainlock™ security key             | n/a         | n/a                | n/a                | n/a               | n/a         | 0.01        |
| 1367         | Drainlock™ grating lifting tool 835 | n/a         | n/a                | n/a                | n/a               | n/a         | 0.2         |



23415  
Drainlock security locking assembly



23416  
Drainlock security key



1367  
Drainlock grating lifting tool 835

**6** Indicates security locking available.

\*Not suitable for carriageways of public roads or motorways.

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



# ACO MultiDrain® M150PPD channels with UltraSTEEL™ galvanised edge rails

ACO MultiDrain® M150PPD channels are manufactured from recycled polypropylene and are 100% recyclable.

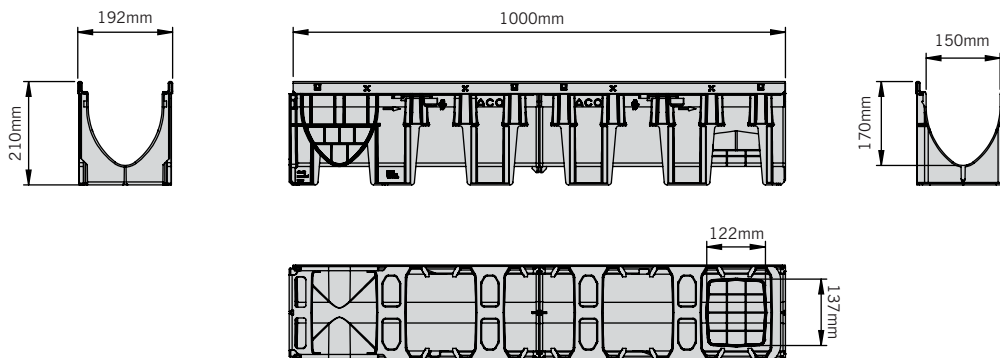
ACO MultiDrain® M150PPD channels listed below are provided with integral galvanised steel protective edge rails. For enhanced durability these rails are manufactured from UltraSTEEL™, a unique material that has improved strength over plain steel.

The added benefit of UltraSTEEL™ is that its greater surface area improves the bond between rail and adjacent material where a sealed system is required.

For the ACO MultiDrain® M150PPD range of gratings to suit these channels please refer to page 20.

## Constant depth channel with UltraSTEEL™ edge rails

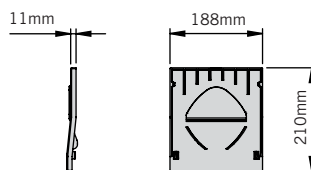
| Product code | Description      | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11151        | M150PPD No.0.0J* | 1000        | 192                | 210                | 170               | 4.0         |



M150PPD 1m constant depth channel

## Universal closing end cap

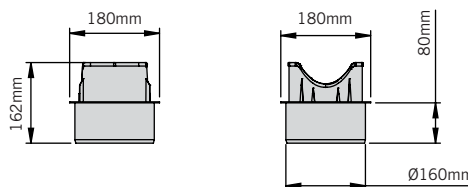
| Product code | Description                       | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|-----------------------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11093        | M150PPD universal closing end cap | 11          | 188                | 210                | -                 | 0.1         |



M150PPD universal closing end cap

## Outlet connector

| Product code | Description                      | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|----------------------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11288        | Ø160mm vertical outlet connector | -           | Ø160               | 80                 | -                 | 0.3         |



M150PPD Ø160mm vertical outlet connector (max flow 18 l/s)

J Indicates side knockout for 90° channel connection. Knockout on both sides of the channel.

\* Indicates channels supplied with vertical outlet knockout for use with Ø160mm outlet connectors. Outlet connectors supplied separately, see table above for details.

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

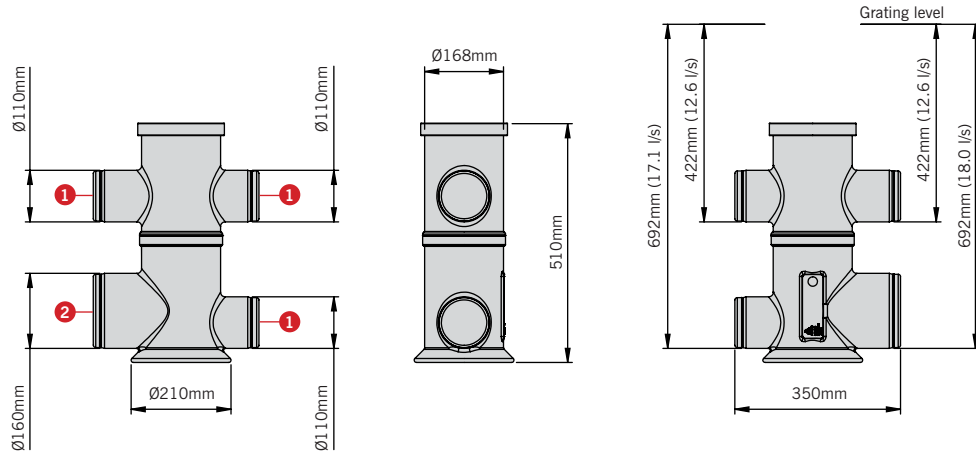


## M150PPD sump unit

| Product code | Description   | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|-------------------|-------------|
| 11386        | Black plastic sump unit with galvanised steel silt bucket and Ø160mm outlet connector | 350         | Ø210               | 510                | -                 | 3.7         |

Standard sump outlets

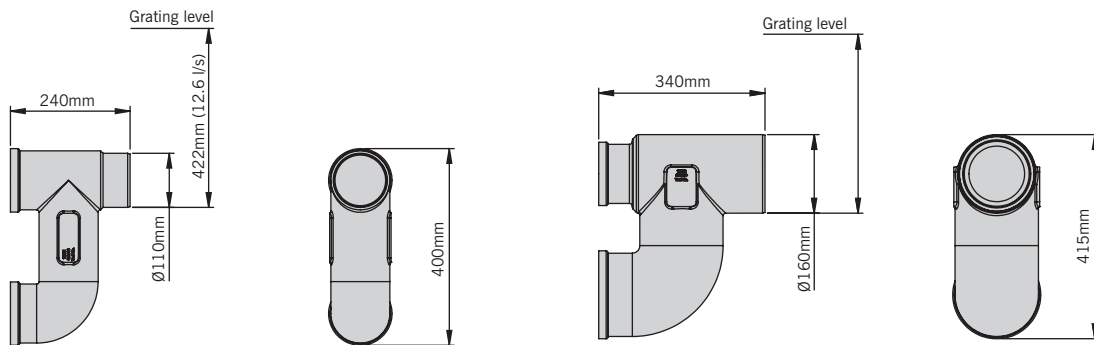
- ① = Ø110mm outlet
- ② = Ø160mm outlet



Note: For guidance on the installation of the sump unit please refer to the ACO MultiDrain® PPD installation manual or visit [www.aco.co.uk](http://www.aco.co.uk).

## Foul air trap

| Product code | Description          | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|----------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11191        | Ø110mm foul air trap | 240         | Ø110               | 400                | 422               | 1.2         |
| 11192        | Ø160mm foul air trap | 340         | Ø160               | 415                | 447               | 1.4         |



Roddable foul air trap LLDPE Ø110mm

Roddable foul air trap LLDPE Ø160mm

Note: For ACO Universal Gully details please refer to page 14.

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

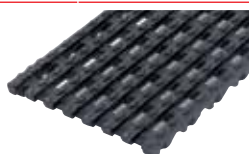


# Gratings for use with ACO MultiDrain® M150PPD channels with UltraSTEEL™ galvanised edge rails

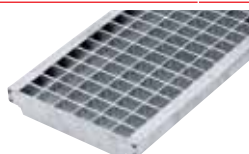


## Gratings for Load Class C 250 applications

| Product code | Description                    | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|--------------------------------|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 13073        | Intercept ductile iron 13073DL | 500         | 173                | 21                 | 30 x 12                   | No         | 59500                            | Yes                | 5.3         |
| 13018        | Mesh galvanised steel 13018DL  | 1000        | 173                | 30                 | 23 x 17                   | No         | 115100                           | Yes                | 7.4         |
| 13019        | Mesh galvanised steel 13019DL  | 500         | 173                | 30                 | 23 x 17                   | No         | 115100                           | Yes                | 3.7         |



13073DL  
Intercept ductile iron



13018DL / 13019DL  
Mesh galvanised steel



## Traditional gratings for Load Class D 400\* applications

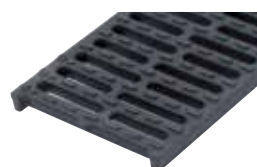
| Product code | Description                              | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 23161        | Heelguard™ ductile iron 23161DL <b>6</b> | 500         | 173                | 28                 | 8                         | Yes        | 40000                            | Yes                | 6.8         |
| 23160        | Solid cover ductile iron 23160DL         | 500         | 173                | 28                 | n/a                       | No         | n/a                              | Yes                | 6.7         |
| 23164        | Slotted ductile iron 23164DL             | 500         | 173                | 28                 | 12                        | No         | 57664                            | Yes                | 6.4         |



23161DL  
Heelguard™ ductile iron



23160DL  
Solid cover ductile iron



23164DL  
Slotted ductile iron

## ACO ATec high performance finish

### Gratings for Load Class D 400\* applications with ACO ATec corrosion resistant coating



| Product code | Description   | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 23169        | ATec coated Heelguard ductile iron 23169DL <b>6</b> | 500         | 173                | 28                 | 8                         | Yes        | 40000                            | Yes                | 6.8         |



23161DL  
Heelguard™ ductile iron



ACO ATec coating is a high performance finish designed for the most demanding of environments. The black corrosion resistant coating provides a strong durable finish which maintains the overall aesthetics of the grating. ACO ATec provides up to 10 times longer protection against corrosion than standard water-based surface coatings

## Grating accessories

| Product code | Description                         | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Invert type | Weight (kg) |
|--------------|-------------------------------------|-------------|--------------------|--------------------|-------------------|-------------|-------------|
| 23165        | Drainlock™ security locking system  | n/a         | n/a                | n/a                | n/a               | n/a         | 0.1         |
| 23416        | Drainlock™ security key             | n/a         | n/a                | n/a                | n/a               | n/a         | 0.01        |
| 1367         | Drainlock™ grating lifting tool 835 | n/a         | n/a                | n/a                | n/a               | n/a         | 0.1         |

**6** Indicates security locking available.

\*Not suitable for carriageways of public roads or motorways.

# ACO MultiDrain® M200PPD channels with UltraSTEEL™ galvanised edge rails

ACO MultiDrain® M200PPD channels are manufactured from recycled polypropylene and are 100% recyclable.

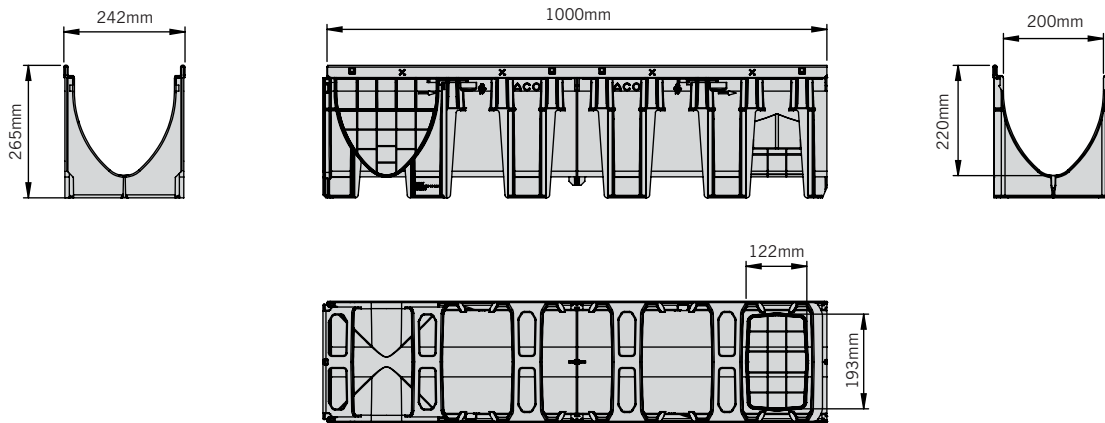
ACO MultiDrain® M200PPD channels listed below are provided with integral galvanised steel protective edge rails. For enhanced durability these rails are manufactured from UltraSTEEL™, a unique material that has improved strength over plain steel.

The added benefit of UltraSTEEL™ is that its greater surface area improves the bond between rail and adjacent material where a sealed system is required.

For the ACO MultiDrain® M200PPD range of gratings to suit these channels please refer to page 23.

## Constant depth channel unit with UltraSTEEL™ edge rails

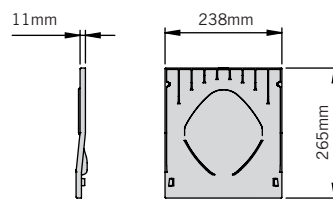
| Product code | Description      | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11158        | M200PPD No.0.0J* | 1000        | 242                | 265                | 220               | 4.9         |



M200PPD 1m constant depth channel

## Universal closing end cap

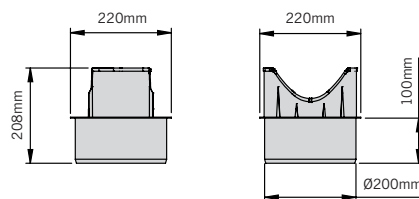
| Product code | Description                       | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|-----------------------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11098        | M200PPD universal closing end cap | 11          | 238                | 265                | -                 | 0.2         |



M200PPD universal closing end cap

## Outlet connector

| Product code | Description                      | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|----------------------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11289        | Ø200mm vertical outlet connector | -           | Ø200               | 100                | -                 | 0.4         |



M200PPD Ø200mm vertical outlet connector (max flow 26.7 l/s)

J Indicates side knockout for 90° channel connection. Knockout on both sides of the channel.

\* Indicates channels supplied with vertical outlet knockout for use with Ø200mm outlet connectors. Outlet connectors supplied separately, see table above for details.

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

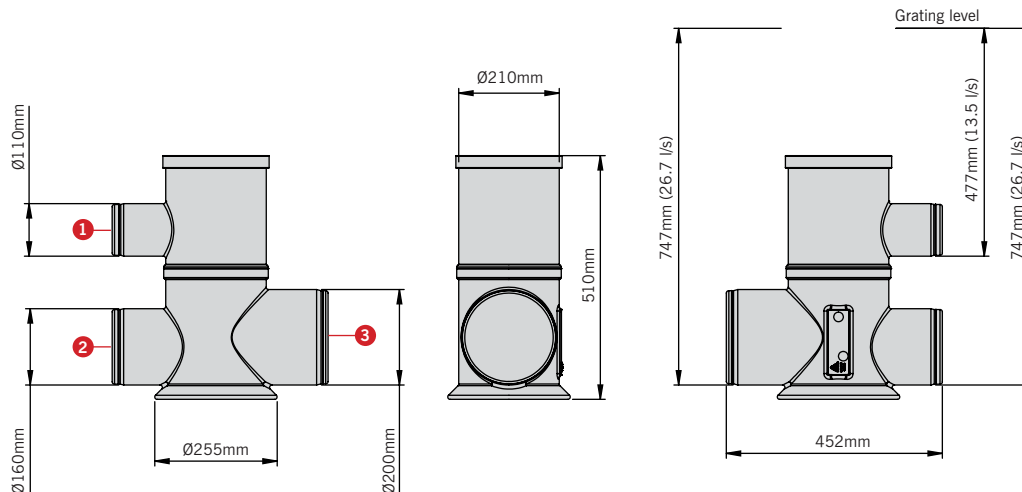


### M200PPD sump unit

| Product code | Description   | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|-------------------|-------------|
| 11387        | Black plastic sump unit with galvanised steel silt bucket and Ø200mm outlet connector | 452         | Ø255               | 510                | -                 | 4.9         |

Standard sump outlets

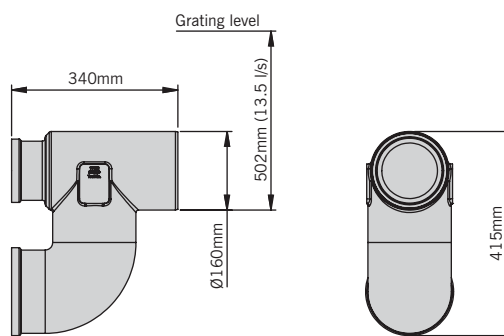
- 1 = Ø110mm outlet
- 2 = Ø160mm outlet
- 3 = Ø200mm outlet



Note: For guidance on the installation of the sump unit please refer to the ACO MultiDrain® PPD installation manual or visit [www.aco.co.uk](http://www.aco.co.uk).

### Foul air trap

| Product code | Description                   | Length (mm) | Width overall (mm) | Depth overall (mm) | Invert depth (mm) | Weight (kg) |
|--------------|-------------------------------|-------------|--------------------|--------------------|-------------------|-------------|
| 11192        | Ø160mm roddable foul air trap | 340         | Ø160               | 415                | 502               | 1.4         |



Roddable foul air trap LLDPE Ø160mm

Note: For ACO Universal Gully details please refer to page 14.

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

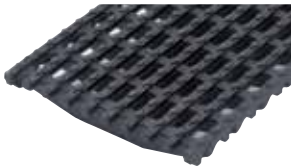


# Gratings for use with ACO MultiDrain® M200PPD channels with UltraSTEEL™ galvanised edge rails

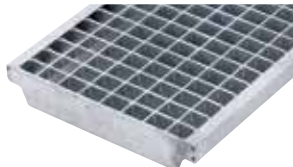


## Gratings for Load Class C 250 applications

| Product code | Description                    | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|--------------------------------|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 13473        | Intercept ductile iron 13473DL | 500         | 223                | 35                 | 30 x 14                   | No         | 90500                            | Yes                | 7.5         |
| 13418        | Mesh galvanised steel 13418DL  | 1000        | 223                | 40                 | 23 x 17                   | No         | 154100                           | Yes                | 12.0        |
| 13419        | Mesh galvanised steel 13419DL  | 500         | 223                | 40                 | 23 x 17                   | No         | 154100                           | Yes                | 6.0         |



13473DL  
Intercept ductile iron



13418DL / 13419DL  
Mesh galvanised steel

## Gratings for Load Class D 400\* applications



| Product code | Description                              | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 23221        | Heelguard™ ductile iron 23221DL <b>6</b> | 500         | 223                | 32                 | 8                         | Yes        | 47300                            | Yes                | 10.3        |
| 23220        | Ductile iron solid cover 23220DL         | 500         | 223                | 32                 | n/a                       | No         | n/a                              | Yes                | 11.0        |
| 23224        | Slotted ductile iron 23224DL             | 500         | 223                | 32                 | 12                        | No         | 72400                            | Yes                | 9.8         |



23221DL  
Heelguard™ ductile iron



23220DL  
Solid cover ductile iron



23224DL  
Slotted ductile iron

## ACO ATec high performance finish

### Gratings for Load Class D 400\* applications with ACO ATec corrosion resistant coating



| Product code | Description   | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Heelguard™ | Intake area (mm <sup>2</sup> /m) | Anti shunt feature | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|---------------------------|------------|----------------------------------|--------------------|-------------|
| 23229        | ATec coated Heelguard ductile iron 23229DL <b>6</b> | 500         | 223                | 32                 | 8                         | Yes        | 47300                            | Yes                | 10.3        |



23229DL  
Heelguard™ ductile iron



ACO ATec coating is a high performance finish designed for the most demanding of environments. The black corrosion resistant coating provides a strong durable finish which maintains the overall aesthetics of the grating. ACO ATec provides up to 10 times longer protection against corrosion than standard water-based surface coatings

## Grating accessories

| Product code | Description                         | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|-------------------------------------|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23225        | Drainlock™ security locking system  | n/a         | n/a                | n/a                | n/a                       | n/a                              | 0.1         |
| 23416        | Drainlock™ security key             | n/a         | n/a                | n/a                | n/a                       | n/a                              | 0.01        |
| 1367         | Drainlock™ grating lifting tool 835 | n/a         | n/a                | n/a                | n/a                       | n/a                              | 0.1         |

**6** Indicates security locking available.

\*Not suitable for carriageways of public roads or motorways.

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



## Problem solving drainage solutions: Discrete slot drainage gratings



ACO MULTIDRAIN PPD  
BRICKSLOT



Galvanised steel



Access units



Load Class

ACO MultiDrain® PPD has a range of gratings to complement installations which require discreet slot drainage.

Designed as standard with a heelguard 10mm off set drainage inlet, ACO Brickslot is a subtle and unobtrusive grating which when combined with an ACO MultiDrain® PPD channel, can be used as a solution to complement discreet drainage applications and is ideal for use against buildings facades.

Compatible with most paving materials, the vertical sides of the grating enable pavements to be laid directly to the unit's edge. Once installed the system is totally secure and not vulnerable to vandalism or loose grates making it a suitable for applications such as schools and playgrounds where grating removal can become a hazard.

The channel and ACO Brickslot grating together provide an unobtrusive continuous slot drainage system, with high hydraulic efficiency for fast removal of surface water. ACO Brickslot gratings are available in galvanised steel and suitable for use with the 100mm, 150mm and 200mm wide channels in the ACO MultiDrain® PPD range.

The system includes an ACO Brickslot access unit to ensure easy maintenance and access to the drainage system, and is also fully compatible with the range of ACO MultiDrain® PPD accessories.

The system is suitable for applications up to and including Load Class D 400 (This product is not suitable for carriageways of public roads or motorways).

### Applications

- Threshold drainage
- Public landscaping
- Car parking
- Light industrial
- HGV parking
- Petrol station forecourts
- SuDS





# Discreet slot drainage gratings

The ACO Brickslot gratings are available in a hot-dipped galvanised steel (Grade 304), to suit the ACO MultiDrain® M100PPD, M150PPD and M200PPD.

The off set grating has an heelguard 10mm drainage inlet, which is compatible with most types of pavements, setts, block and flags up to a maximum of 100mm depth.

The ACO Brickslot gratings are listed in the charts below and are sold separately to the channel units.

For information on the ACO MultiDrain® M100PPD, M150PPD, M200PPD wide channels. Please refer to pages xx.

## ACO Brickslot gratings suitable for use with ACO MultiDrain® M100PPD

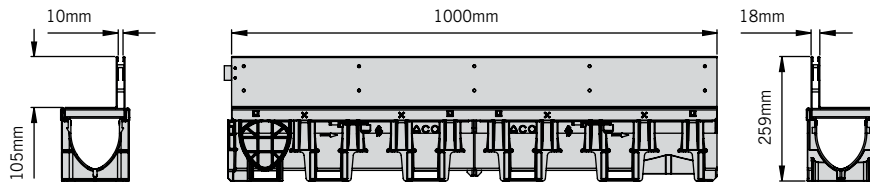
### Gratings for Load Class C 250 applications



| Product code | Description                          | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|--------------------------------------|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23460        | Brickslot top galvanised steel 23460 | 1000        | 135                | 105                | 10                        | 10000                            | 6.5         |
| 23461        | Brickslot top galvanised steel 23461 | 500         | 135                | 105                | 10                        | 10000                            | 3.4         |



23460 / 23461  
Brickslot top galvanised steel



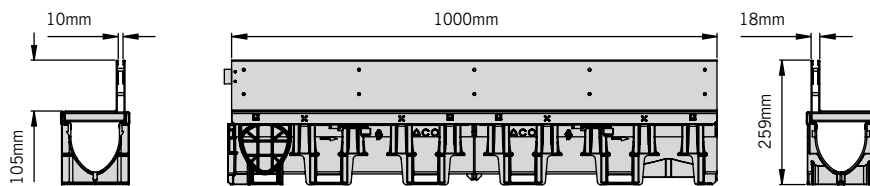
### Gratings for Load Class D 400\* applications



| Product code | Description                          | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|--------------------------------------|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23465        | Brickslot top galvanised steel 23465 | 1000        | 135                | 105                | 10                        | 10000                            | 6.7         |
| 23466        | Brickslot top galvanised steel 23466 | 500         | 135                | 105                | 10                        | 10000                            | 3.4         |



23460 / 23461  
Brickslot top galvanised steel



\*Not suitable for carriageways of public roads or motorways.

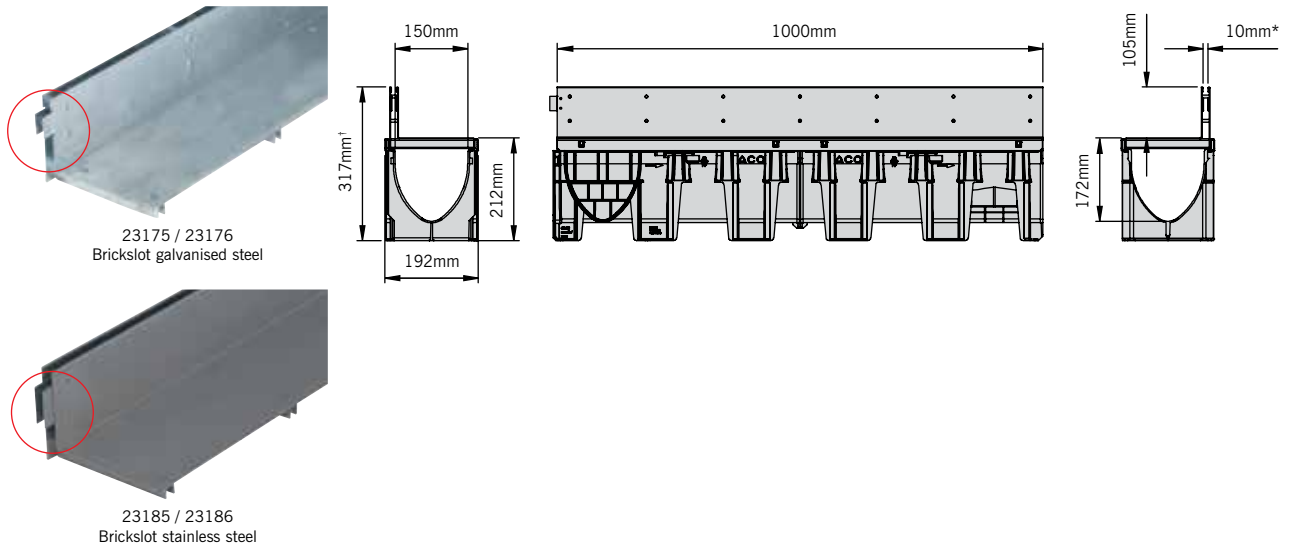


**ACO Brickslot gratings suitable for use with ACO MultiDrain® M150PPD**



**Gratings for Load Class D 400\* applications**

| Product code | Description                      | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|----------------------------------|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23175        | Brickslot galvanised steel 23175 | 1000        | 173                | 105                | 10                        | 10000                            | 7.7         |
| 23176        | Brickslot galvanised steel 23176 | 500         | 173                | 105                | 10                        | 10000                            | 3.9         |

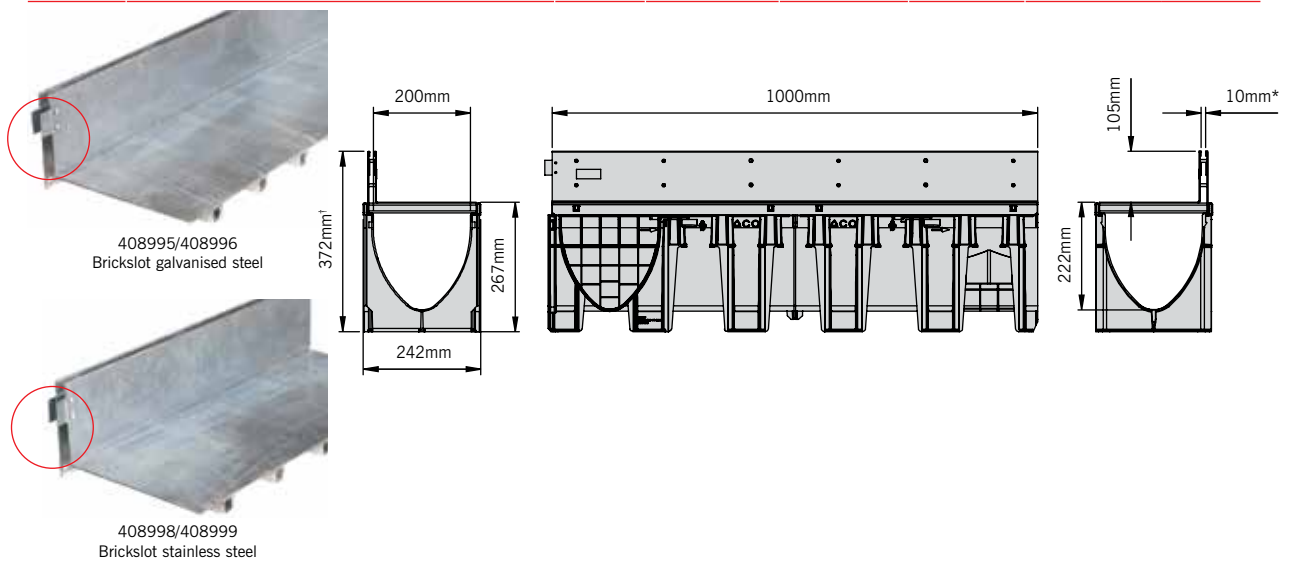


**ACO Brickslot grating suitable for use with ACO MultiDrain® M200PPD**



**Gratings for Load Class D 400\* applications**

| Product code | Description                | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|----------------------------|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 408995       | Brickslot galvanised steel | 1000        | 223                | 105                | 10                        | 10000                            | 9.8         |
| 408996       | Brickslot galvanised steel | 500         | 223                | 105                | 10                        | 10000                            | 4.8         |



**Note:** To obtain the overall height (marked †) add 105mm to the overall channel depth.  
 The overall depth of each channel can be found in the channel tables in this brochure.  
 \*Not suitable for carriageways of public roads or motorways.



# Discreet slot drainage access units

The ACO Brickslot grating system has an access unit for easy maintenance and cleaning of the drainage system. The access unit is positioned within the channel; it has a removable tray section which is lifted out of the frame by a lifting tool to gain access to the system.

The access unit is 0.5m in length and is available in the galvanised and stainless steel finishes and is suitable for use with any ACO MultiDrain® M100PPD, M150PPD and M200PPD wide channels.

The unit has a heelguard 10mm off set drainage inlet, providing continuous aesthetic and drainage performance once installed with the drainage system.

The ACO Brickslot access units are listed in the charts below and are sold separately to the channel units. For information on the ACO MultiDrain® M100PPD, M150PPD and M200PPD wide channels. Please refer to pages xx”

## ACO Brickslot access unit suitable for use with ACO MultiDrain® M100PPD

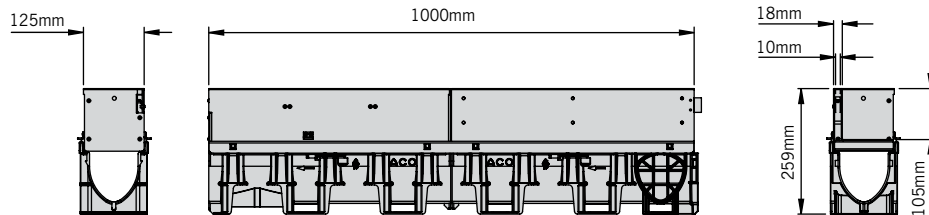
### Access covers of Load Class C 250 applications



| Product code | Description                                  | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23462        | Brickslot access unit galvanised steel 23462 | 500         | 135                | 105                | 10                        | 10000                            | 6.6         |



23462 Brickslot access unit galvanised steel.



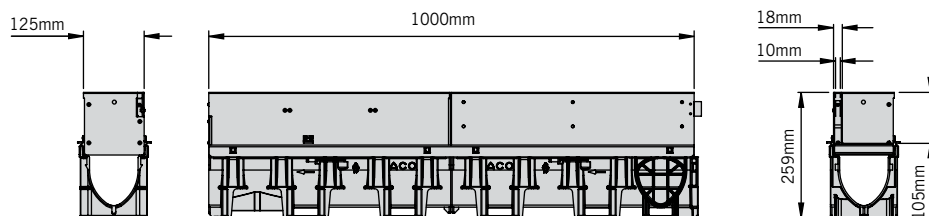
### Access Covers for Load Class D 400\* applications



| Product code | Description                                  | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23467        | Brickslot access unit galvanised steel 23467 | 500         | 135                | 105                | 10                        | 10000                            | 6.4         |



23467 Brickslot access unit galvanised steel.



\*Not suitable for carriageways of public roads or motorways.



**ACO Brickslot access unit for use with ACO MultiDrain® M150D**

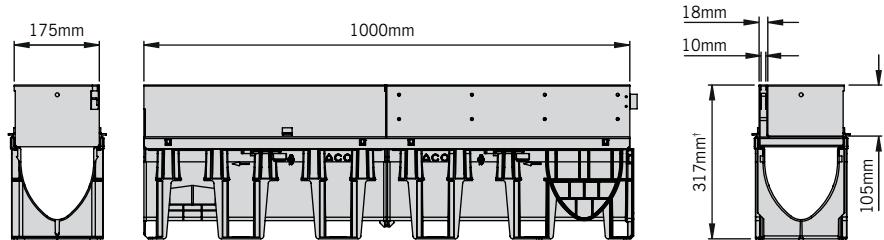


**Access Covers for Load Class D 400\* applications**

| Product code | Description                            | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|--|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 23177        | Brickslot access unit galvanised steel | 500         | 185                | 105                | 10                        | 10000                            | 7.5         |



23177 Brickslot access unit galvanised steel.



**ACO Brickslot access unit for use with ACO MultiDrain® M200D**

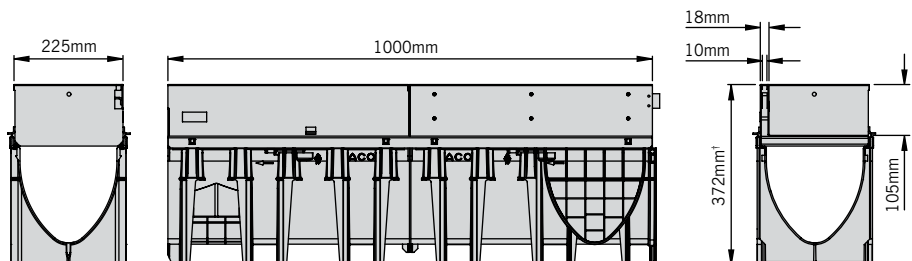


**Access Covers for Load Class D 400\* applications**

| Product code | Description                                   | Length (mm) | Width overall (mm) | Depth overall (mm) | Slot width /hole dia (mm) | Intake area (mm <sup>2</sup> /m) | Weight (kg) |
|--------------|---|-------------|--------------------|--------------------|---------------------------|----------------------------------|-------------|
| 408997       | Brickslot access unit galvanised steel 408997 | 500         | 223                | 105                | 10                        | 10000                            | 8.5         |



408997 Brickslot access unit galvanised steel.



**Removal instructions.**

To remove the ACO Brickslot access unit tray, insert the lifting tools as shown in figure 1. Then lift the tray vertically from the frame (figure 2). Details on the lifting tools can be found on page 17.



Figure 1



Figure 2

**Note:** To obtain the overall height (marked †) add 105mm to the overall channel depth. The overall depth of each channel can be found in the channel tables in this brochure.  
 \*Not suitable for carriageways of public roads or motorways.



# Preparing the system for installation

## Channel base knockout details

ACO MultiDrain® PPD channels are supplied with a pre-formed knockout in the base of the channels. This detail at the male end of the channel allows vertical connection to Ø110mm, Ø160mm and Ø200mm U-PVC pipes and sump via outlet connectors. The knockout on the base of the channel is indicated by a “hammer” symbol. The method of removal and pipe connection is described below.



### METHOD:

**Step 1:** 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 2:** Push fit outlet connector with integral EPDM seal into recess. Connect ongoing pipework onto connector as required.



## 90° channel connection detail

An additional feature provided on the channels\* is removable side wall panels. This feature allows 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 joint profile is provided to aid alignment and fast installation.



### METHOD:

**Step 1:** Insert the grating to support channel. Tap segments of the knockout panel as indicated to remove.



**Step 2:** Tidy up any remaining material. Channel connection can now be made.



\*This feature does not apply to shallow depth channels.

## Creating 0.5m channels

The ACO MultiDrain® PPD 1m channels can be cut down to form 0.5m units.

A cutting guide is provided on the channel body.

Once cut, connection profiles are provided to enable simple and fast installation. The method of cutting the channels is described below.



### METHOD:

**Step 1:** Place saw into the cutting guide as shown. Cut channel ensuring the saw blade follows the guide provided.



**Step 2:** Once the channel is cut tidy up edges as required. Channels can now be used as 0.5m units.



### Watertight sealing

Channels are generally installed without a water seal. Once butt jointed and with a concrete surround a fairly watertight installation can be achieved.

If however, a more definite seal is required, this channel has a groove allowing a flexible sealant to be applied either during or following installation. For rainwater applications we recommend a single component, polyurethane based elastomeric joint sealant such as Masterflex 472 or Sikaflex 11FC or similar.

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



Sealant groove

#### METHOD:

**Step 1:** Jointing faces of the channels to be sound and cleaned to remove all loose material, dust, oil and grease.

**Step 2:** Butt joint the channels & install as per ACO installation instructions. Ensure 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.

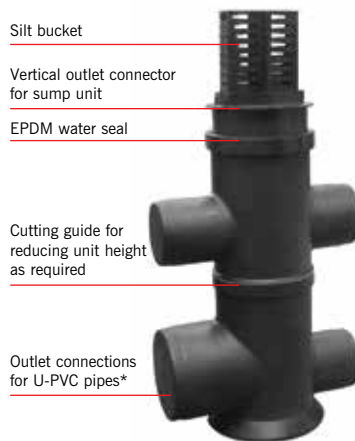
**Step 3:** Wipe excess sealant from the inside faces of the channel & inspect sealant groove to ensure it has been fully filled with sealant.



Leave sealant to cure before use as per the sealant manufacturer's recommendations.

### Sump unit

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



ACO MultiDrain® PPD sump unit

#### METHOD:

**Step 1:** Remove pre-formed knockout in channel as described on page 7 and fit outlet connector provided with sump to channel.



**Step 2:** Place channel with outlet connector over sump unit and push fit to required height. Lubricate seals if necessary. Insert silt bucket into the sump body as shown.



\*Please see Specification manual for outlet dimensions

### Sump cutting guide

The LLDPE chamber unit can be reduced in height to 280mm if a compact sump is required. A cutting guide is provided and the method is described below.



Cutting guide for reducing sump height

#### METHOD:

**Step 1:** Cut sump body and silt bucket in positions shown (Only M100PPD silt bucket can be cut down).



**Step 2:** Remove EPDM seal from upper part of sump body and lifting handle from sump bucket. Re-fit in positions shown.



**Step 3:** Compact sump unit is now ready for fitting to channel as previously described.



## Sump outlet connections

The LLDPE chamber unit is provided with outlet connections\*. Outlet connections are supplied closed, and need to be opened prior to connection to ongoing pipework or foul air traps. The method is described below.



Sump outlet connections

### METHOD:

**Step 1:** To remove closed section of outlet, simply cut in position shown. For connection to foul air traps remove upper and lower closed sections of outlets provided. For pipework connection, remove closed section of outlet as required.



**Step 2:** Lubricate seals of pipework or foul air trap as required and push fit onto unit

(image shows fitting of Ø110mm foul air trap).



## 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 LLDPE.



Ø110mm foul air trap



Ø160mm foul air trap

ACO MultiDrain® PPD foul air traps

### METHOD:

**Step 1:** Remove upper and lower closed sections of the outlets provided (Ø110 or Ø160). Lubricate foul air trap as required and push fit onto unit (image shows fitting of Ø110mm foul air trap).



**Step 2:** Insert bung into sump body in position shown. Bung can be removed for rodding.



## ACO Universal Gully

The ACO Universal Gully provides fast and simple connection between any channel sizes up to 200mm width in the ACO channel drainage range. It also provides an outlet to connect to traditional underground drainage. The ACO Universal Gully is a recycled plastic modular system with a ductile iron frame and grating.

Ductile iron hinged gully frame and grating



Cutting guide to suit most ACO channels



Silt bucket



Gully base including roddable foul air trap



ACO Universal Gully

### METHOD:

#### Cutting gully intermediate unit

Once installed ACO Universal Gully can be cut to match channel depth.



#### Cutting gully frame

**Step 1:** Using a disc cutter, make two vertical cuts in the frame following the relevant channel bore guide provided. Panels only need to be removed when channels have an overall depth of 150mm or less.



**Step 2:** Make a cut parallel to the top edge of the frame following the cutting guide provided until it converges with the two previous cuts made in Step 1.



**Note:** Cuts should not be made outside of the area demarked by the cutting guides.

For further instructions on the installation of ACO Universal Gully please refer to page 6.

# Designing an ACO MultiDrain® PPD drainage system

ACO Technologies online Hydraulic Design Software has been developed to give specifying engineers the option of designing and selecting the most appropriate channel drainage system for themselves, or using the tool in partnership with our dedicated Technical and Design Service. Using differential equations for spatially varied flow, this free online tool calculates the hydraulic capacity of channels accepting flow along their entire length. The software accurately analyses flow in the selected channel system to ensure it has sufficient capacity. The software user can also optimise the design and potentially downsize all or part of the channel system if the initial channel selection was oversized.



## Designing a drainage system

The designer must input the rainfall intensity and total catchment area draining to each run of channel to calculate inflow to that channel system.

For normal situations Building Regulations (Approved Document Part H, 2015) suggests a default value of 50 mm/hour rainfall intensity should be an appropriate for catchments <4,000m<sup>2</sup>. For larger drainage areas the designer should refer to BS EN 752.

Where a specifier seeks to design their project in accordance with National Planning Policy Framework and to Sewers for Adoption (7th edition) they will need to manage rainfall runoff at source, and consider incorporating a Sustainable Drainage System in their design. They will also need to consider the effects of climate change on changing rainfall patterns and intensities over the lifetime of the development.

**i** It should be noted that other calculation methods will not give the correct results for channel drainage systems. In particular the use of equations of steady uniform flow, such as Manning's equation, is not appropriate for channel drainage design. They will not work with level channels and give grossly inaccurate results at shallow gradients.

Using Flood Studies Report procedures to analyse rainfall frequency, intensity and duration, the Design Software allows the specifier to change the selected storm intensity and duration to the required standard (e.g. to the 1 in 30 and 1 in 100 year return periods), and to make allowance for the effects of climate change on rainfall over the lifetime of the development.

The design software also allows the end user to estimate alternative storage requirements.

ACO can also provide specifiers with conduit files for use in proprietary software like Micro Drainage. Please contact the Design Services Team if you require any further information.

## ACO Water Management Design Services Team

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. By using ACO MultiDrain® PPD water can 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.

For detailed designs using the ACO Hydraulic Design Software, please contact the ACO Water Management Design Services Team. The team should also be consulted for advice where the inflow is not uniformly distributed along the channel.

To enable the designer to complete manual calculations ACO has published hydraulic performance tables within this document to facilitate a quick manual design method for the determination of your drainage requirements.

### ACO Water Management Design Services Team

Tel: 01462 816666  
Email: [technical@aco.co.uk](mailto:technical@aco.co.uk)



### ACO Hydraulic Design Software

Register online for our free, secure online design software:

- ▶ All designs are securely stored and easily accessed online
- ▶ Data always up-to-date
- ▶ Proven calculation methodology - more accurate and efficient designs
- ▶ Flexible catchment design
- ▶ Integrated rainfall data
- ▶ Automated product optimisation
- ▶ PDF summary documents



**Register Now - It's Free**  
[www.acodesign.co.uk](http://www.acodesign.co.uk)





# Design method

All channels within the ACO MultiDrain® PPD range are constant depth units. ACO MultiDrain® PPD is available in three width and depth configurations with two additional shallow channel options on the 100mm wide system.

These channel drainage systems should be laid level to the surface, with gratings located just below finished ground level. Where a longitudinal fall exists along the length of a system the hydraulic performance of that system, and hence the hydraulic capacity, will be enhanced. Improved hydraulic performance will enable the designer to increase the spacing between adjacent outfalls.

The hydraulic capacity of channels accepting lateral inflow all along their length can be calculated by the analysis of the differential equations for spatially varied flow, a procedure that requires a computer program such as the proprietary ACO Hydro software or ACO's new online design software.

For more information or help with detailed designs requiring ACO's Hydro software please contact the ACO Water Management Design Services team, or visit us at [www.aco.co.uk](http://www.aco.co.uk).

The team may also be consulted for advice where the inflow is not uniformly distributed along the channel and for channels with pre-sloped inverts.

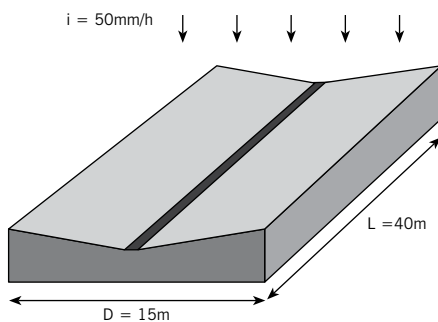
The tables on the following page have been produced from the ACO Hydro software to facilitate a quick manual design method for the determination of the drainage requirements.

The columns showing catchment area (A m<sup>2</sup>) are based on the standard rainfall intensity of 50 mm/hour and should be revised accordingly where other rainfall intensities are to be employed. The columns of maximum flow rate (Q l/s) and maximum lateral inflow (q l/s/m) hold true for all rainfall intensities and do not need revision with different design criteria.

## ACO Water Management Design Services Team

Tel: 01462 816666  
Email: [technical@aco.co.uk](mailto:technical@aco.co.uk)

### DESIGN EXAMPLE



For a design of ACO MultiDrain® M100PPD, assume the following figures:

- D = 15m (depth of catchment area)
- L = 40m (length of channel run = length of catchment)
- i = 50mm/h (design rainfall intensity)
- Ground slope = 0%

Note that any other rainfall intensity may be used. Typical intensities (from BS EN 752) are 50mm/h for areas where some ponding could be tolerated for a few minutes after heavy rainfall, or 75mm/h where ponding cannot normally be tolerated.

#### 1. Determine the area

$$\text{Area} = L \times D = 40 \times 15 = 600\text{m}^2$$

For a quick analysis, see the tables and the columns for area on page 16.

600m<sup>2</sup> is too large for one 40m run of ACO MultiDrain® M100PPD.

However a 20m run can drain 302m<sup>2</sup>, so one central outlet will work, with 20m of channel each side, each draining 300m<sup>2</sup>.

Or for a more detailed analysis, determine the total flow rate, as follows:

#### 2. Determine total flow (Q)

$$Q = (\text{area} \times i) / 3600 = (600 \times 50) / 3600 = 8.33 \text{ l/s}$$

#### 3. Determine lateral inflow (q)

$$q = Q / L = 8.33 / 40 = 0.208 \text{ l/s/m}$$

#### 4. Determine suitable channel sizes and lengths

For ACO MultiDrain® M100PPD interpolation between the value at 20m and 30m, a maximum length of 21m could carry 0.208 l/s/m. Alternatively use ACO MultiDrain® M150PPD to an end outlet, where the tables show that 40m can carry 9.8 l/s and drain 704m<sup>2</sup>.

#### 5. Check Outlet capacity

Ensure that the proposed outlet has sufficient hydraulic capacity by reference to the product technical pages.



## Hydraulic Performance Tables (for lateral flow)

### Notes for ACO MultiDrain® M100PPD Hydraulic tables

The table opposite shows the maximum capacity of the channel, assuming uniform lateral inflow to the channel. The capacity will depend on the length of channel to the outlet and on any slope along the channel.

Q (l/s) is the maximum total flow that the channel can carry.

q (l/s/m) is the maximum possible lateral inflow.

A (m<sup>2</sup>) is the maximum area that can be drained and will depend on the design rainfall intensity chosen. The tabulated areas are for a rainfall intensity of 50 mm/h (0.014 l/s/m<sup>2</sup>).

At other rainfall intensities, the area can be determined by proportion, e.g. at 75mm/h, the maximum area drained will be the tabulated area x 50/75.

### ACO Water Management Design Services Team

Please contact the ACO Water Management Design Services Team on 01462 816666 for advice on channels with non-uniform inflow, or channels receiving point inflows at the end or at intermediate locations.

The ACO Water Management Design Services Team will be pleased to assist with any technical queries, scheme designs or parts schedules.

### ACO MultiDrain® M100PPD 075 shallow depth channel

| Length to Outlet (m) | 0%      |           |                     | 0.5%    |           |                     | 1%      |           |                     |
|----------------------|---------|-----------|---------------------|---------|-----------|---------------------|---------|-----------|---------------------|
|                      | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) |
| 10                   | 1.4     | 0.14      | 98                  | 1.6     | 0.16      | 114                 | 2.0     | 0.20      | 141                 |
| 20                   | 1.3     | 0.06      | 91                  | 1.7     | 0.09      | 124                 | 2.2     | 0.11      | 158                 |
| 30                   | 1.2     | 0.04      | 85                  | 1.8     | 0.06      | 128                 | 2.3     | 0.08      | 167                 |
| 40                   | 1.1     | 0.03      | 80                  | 1.8     | 0.04      | 128                 | 2.4     | 0.06      | 173                 |
| 50                   | 1.0     | 0.02      | 75                  | 1.8     | 0.04      | 129                 | 2.4     | 0.05      | 175                 |
| 60                   | 1.0     | 0.02      | 73                  | 1.8     | 0.03      | 129                 | 2.5     | 0.04      | 177                 |

### ACO MultiDrain® M100PPD 0100 shallow depth channel

| Length to Outlet (m) | 0%      |           |                     | 0.5%    |           |                     | 1%      |           |                     |
|----------------------|---------|-----------|---------------------|---------|-----------|---------------------|---------|-----------|---------------------|
|                      | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) |
| 10                   | 2.2     | 0.22      | 161                 | 2.7     | 0.27      | 194                 | 3.1     | 0.31      | 224                 |
| 20                   | 2.1     | 0.11      | 152                 | 2.9     | 0.15      | 210                 | 3.6     | 0.18      | 259                 |
| 30                   | 2.0     | 0.07      | 144                 | 3.0     | 0.10      | 216                 | 3.8     | 0.13      | 275                 |
| 40                   | 1.9     | 0.05      | 138                 | 3.0     | 0.08      | 218                 | 3.9     | 0.10      | 280                 |
| 50                   | 1.8     | 0.04      | 129                 | 3.0     | 0.06      | 219                 | 4.0     | 0.08      | 285                 |
| 60                   | 1.7     | 0.03      | 121                 | 3.1     | 0.05      | 220                 | 4.0     | 0.07      | 289                 |

### ACO MultiDrain® M100PPD No 0.0J constant depth channel

| Length to Outlet (m) | 0%      |           |                     | 0.5%    |           |                     | 1%      |           |                     |
|----------------------|---------|-----------|---------------------|---------|-----------|---------------------|---------|-----------|---------------------|
|                      | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) |
| 10                   | 4.7     | 0.47      | 338                 | 5.2     | 0.52      | 375                 | 6.2     | 0.62      | 446                 |
| 20                   | 4.2     | 0.21      | 302                 | 5.6     | 0.28      | 403                 | 7.0     | 0.35      | 504                 |
| 30                   | 3.9     | 0.13      | 281                 | 5.9     | 0.20      | 423                 | 7.5     | 0.25      | 539                 |
| 40                   | 3.7     | 0.09      | 264                 | 6.0     | 0.15      | 432                 | 7.7     | 0.19      | 556                 |
| 50                   | 3.5     | 0.07      | 252                 | 6.1     | 0.12      | 437                 | 7.9     | 0.16      | 569                 |
| 60                   | 3.3     | 0.06      | 238                 | 6.1     | 0.10      | 441                 | 8.1     | 0.13      | 582                 |
| 70                   | 3.1     | 0.04      | 224                 | 6.2     | 0.09      | 443                 | 8.2     | 0.12      | 590                 |
| 80                   | 2.9     | 0.04      | 212                 | 6.2     | 0.08      | 445                 | 8.3     | 0.10      | 595                 |
| 90                   | 2.8     | 0.03      | 204                 | 6.2     | 0.07      | 447                 | 8.3     | 0.09      | 598                 |
| 100                  | 2.8     | 0.03      | 200                 | 6.2     | 0.06      | 448                 | 8.3     | 0.08      |                     |



**Notes for ACO MultiDrain®  
M150PPD and M200PPD  
Hydraulic tables**

The table opposite shows the maximum capacity of the channel, assuming uniform lateral inflow to the channel. The capacity will depend on the length of channel to the outlet and on any slope along the channel.

Q (l/s) is the maximum total flow that the channel can carry.

q (l/s/m) is the maximum possible lateral inflow.

A (m<sup>2</sup>) is the maximum area that can be drained and will depend on the design rainfall intensity chosen. The tabulated areas are for a rainfall intensity of 50 mm/h (0.014 l/s/m<sup>2</sup>).

At other rainfall intensities, the area can be determined by proportion, e.g. at 75mm/h, the maximum area drained will be the tabulated area x 50/75.

**ACO Water Management Design  
Services Team**

Please contact the ACO Water Management Design Services Team on 01462 816666 for advice on channels with non-uniform inflow, or channels receiving point inflows at the end or at intermediate locations.

The ACO Water Management Design Services Team will be pleased to assist with any technical queries, scheme designs or parts schedules.

**ACO MultiDrain® M150PPD No 0.0J constant depth channel**

| Length to Outlet (m) | 0%      |           |                     | 0.5%    |           |                     | 1%      |           |                     |
|----------------------|---------|-----------|---------------------|---------|-----------|---------------------|---------|-----------|---------------------|
|                      | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) |
| 10                   | 11.6    | 1.16      | 835                 | 12.9    | 1.29      | 929                 | 15.2    | 1.52      | 1094                |
| 20                   | 10.9    | 0.55      | 787                 | 14.0    | 0.70      | 1008                | 17.4    | 0.87      | 1253                |
| 30                   | 10.3    | 0.34      | 743                 | 14.8    | 0.49      | 1066                | 18.8    | 0.63      | 1352                |
| 40                   | 9.8     | 0.24      | 704                 | 15.4    | 0.39      | 1110                | 19.6    | 0.49      | 1412                |
| 50                   | 9.3     | 0.19      | 671                 | 15.9    | 0.32      | 1141                | 20.3    | 0.41      | 1462                |
| 60                   | 8.9     | 0.15      | 639                 | 16.2    | 0.27      | 1165                | 20.8    | 0.35      | 1500                |
| 70                   | 8.5     | 0.12      | 609                 | 16.4    | 0.23      | 1183                | 21.3    | 0.30      | 1530                |
| 80                   | 8.2     | 0.10      | 593                 | 16.6    | 0.21      | 1196                | 21.6    | 0.27      | 1558                |
| 90                   | 8.1     | 0.09      | 583                 | 16.7    | 0.19      | 1205                | 21.9    | 0.24      | 1575                |
| 100                  | 8.0     | 0.08      | 576                 | 16.8    | 0.17      | 1210                | 22.0    | 0.22      | 1584                |

**ACO MultiDrain® M200PPD No 0.0J constant depth channel**

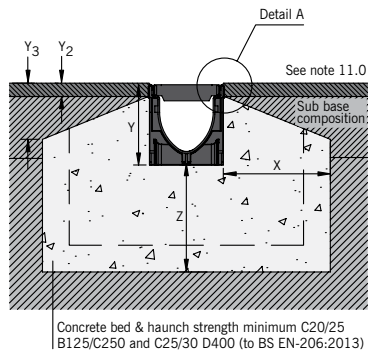
| Length to Outlet (m) | 0%      |           |                     | 0.5%    |           |                     | 1%      |           |                     |
|----------------------|---------|-----------|---------------------|---------|-----------|---------------------|---------|-----------|---------------------|
|                      | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) | Q (l/s) | q (l/s/m) | A (m <sup>2</sup> ) |
| 10                   | 22.5    | 2.25      | 1620                | 24.2    | 2.42      | 1740                | 25.8    | 2.58      | 1860                |
| 20                   | 22.0    | 1.10      | 1584                | 27.8    | 1.39      | 2000                | 32.6    | 1.63      | 2350                |
| 30                   | 21.3    | 0.71      | 1530                | 29.6    | 0.99      | 2130                | 35.6    | 1.19      | 2560                |
| 40                   | 20.8    | 0.52      | 1498                | 30.6    | 0.76      | 2200                | 37.5    | 0.94      | 2700                |
| 50                   | 20.0    | 0.40      | 1440                | 31.5    | 0.63      | 2270                | 39.0    | 0.78      | 2810                |
| 60                   | 19.5    | 0.33      | 1406                | 32.4    | 0.54      | 2335                | 39.9    | 0.66      | 2870                |
| 70                   | 18.8    | 0.27      | 1350                | 33.1    | 0.47      | 2380                | 40.8    | 0.58      | 2940                |
| 80                   | 17.9    | 0.22      | 1288                | 33.5    | 0.42      | 2410                | 42.5    | 0.53      | 3057                |
| 90                   | 17.4    | 0.19      | 1250                | 33.9    | 0.38      | 2440                | 42.9    | 0.48      | 3090                |
| 100                  | 17.2    | 0.17      | 1235                | 34.4    | 0.34      | 2480                | 43.8    | 0.44      | 3150                |
| 120                  | 16.3    | 0.14      | 1175                | 35.3    | 0.29      | 2540                | 45.1    | 0.38      | 3249                |
| 140                  | 15.5    | 0.11      | 1118                | 35.8    | 0.26      | 2574                | 46.1    | 0.33      | 3320                |
| 160                  | 14.9    | 0.09      | 1075                | 36.3    | 0.23      | 2616                | 47.1    | 0.29      | 3390                |
| 180                  | 14.4    | 0.08      | 1040                | 36.5    | 0.20      | 2625                | 47.6    | 0.26      | 3430                |
| 200                  | 14.2    | 0.07      | 1022                | 36.6    | 0.18      | 2635                | 47.9    | 0.24      | 3450                |



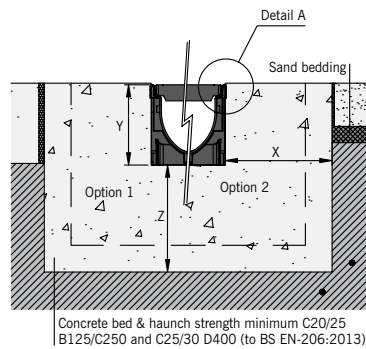
# Installation detail

## CHANNELS WITH TRADITIONAL GRATINGS

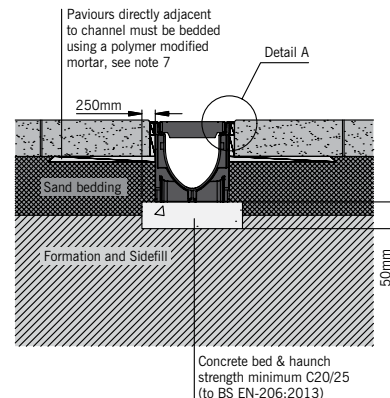
### Asphalt pavement



### Concrete pavement or block paving



### Installation Load Class A 15



### 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 appropriate sealant (e.g. Sikaflex 11FC or similar). 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 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 junctions 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.

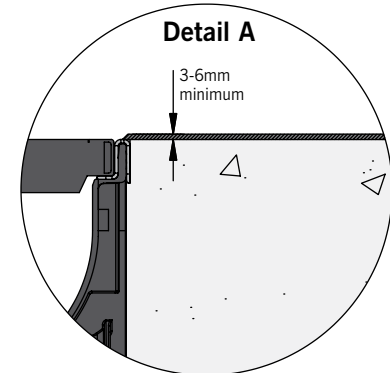
Additional crack control may be required to comply with specifier requirements.

### 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. with 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 a 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

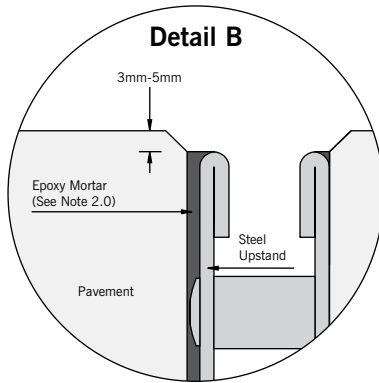
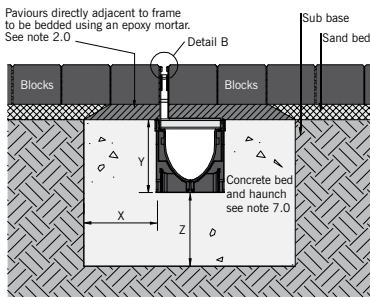
Gratings should be securely fixed to the channel, where required, using an appropriate grate lock system (where available).



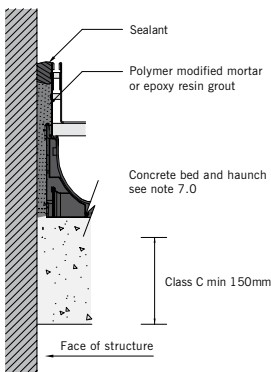
# Installation detail

## CHANNELS WITH BRICKSLOT GRATINGS

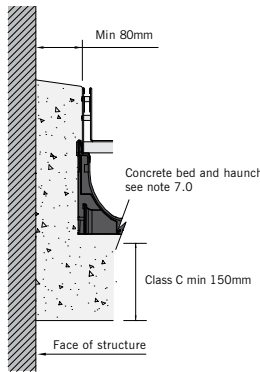
### Standard Brickslot top



### Adjacent to a structure - option 3



### Adjacent to a structure - option 4



**i** An electronic version of the ACO MultiDrain® PPD installation detail is available to download from the ACO website. Visit [www.aco.co.uk](http://www.aco.co.uk).

## 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).

## 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 should be used (e.g. Sikaflex 11FC or similar). Guidance on the necessary surface preparation and/or priming should be sought from the sealant manufacturer.

## 11.0 Minimum Dimensions of Concrete Surround

| Load Class      |                | B 125  | C 250 | D 400* |
|-----------------|----------------|--|-------|--------|
| Minimum         | x              | 150  | 150   | 200    |
| Dimensions (mm) | y              | Full channel height (Less Y2 where applicable) |       |        |
|                 | z              | 150  | 150   | 200    |
| Maximum         | Y <sub>2</sub> | 80   | 25    | 25     |
| Dimensions (mm) | Y <sub>3</sub> | 105  | 60    | 60     |

\* e.g. parking areas for all types of road vehicle. Not suitable for carriageway of roads or industrial areas.

## 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® PPD range. ACO MultiDrain® PPD should be installed using levels of workmanship that accord with the National Code of Practice (UK: BS8000-0:2014) and in keeping with BS 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 steel and iron products have good corrosion resistance to concrete and mortar products but may experience corrosion if high chloride and/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.**

For further information please contact our Design Services Team ([technical@aco.co.uk](mailto:technical@aco.co.uk)) or the ACO website [www.aco.co.uk](http://www.aco.co.uk).



# Chemical resistance chart

ACO polypropylene has a high resistance to dilute acids and alkalis, and is 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 polypropylene channels can be supplied to customers for their own testing. The chemical resistance will also depend on the temperature of the effluent.

The resistance of the gratings and edge rails should also be considered.

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

## Important considerations for chemical environments

When reviewing potential applications for ACO MultiDrain® PPD in chemical environments, the following issues should be considered;

- ▶ Type(s) & mixture of chemical(s).
- ▶ Concentration percentages.
- ▶ Contact time with drainage system.
- ▶ Temperatures of chemicals flowing into the drainage system (82°C max).
- ▶ Flushing system employed to clear chemicals from the drainage system.
- ▶ Cleaning agents should be checked for compatibility with channel materials.
- ▶ ACO samples can be used for final determination of chemical resistance.
- ▶ Grating, locking mechanism, edge rail, outlet and sump unit materials should be checked for chemical resistance.
- ▶ Check sealant for compatibility.

| Chemical medium         | % conc     | Resistance: Polypropylene |
|-------------------------|------------|---------------------------|
| Acetic acid, glacial    | 100        | Fair                      |
| Acetic acid             | 80         | Yes                       |
| Acetic anhydride        | 100        | Fair                      |
| Acetone                 | 100        | Yes                       |
| Aluminium sulfate       | 100        | Yes                       |
| Ammonium chloride       | 100        | Yes                       |
| Ammonium nitrate        | 100        | Yes                       |
| Ammonium phosphate      | 100        | Yes                       |
| Ammonium sulfate        | 100        | Yes                       |
| Aniline (aminobenzene)  | 100        | Yes                       |
| Aniline hydrochloride   | 100        | No                        |
| Aromatic hydrocarbons   |            | No                        |
| Aqua regia              |            | Yes                       |
| Barium chloride         | 100        | Yes                       |
| Beer                    | 100        | Yes                       |
| Benzene                 | 100        | No                        |
| Benzyl alcohol          | 100        | Yes                       |
| Benzyl chloride         | 100        | Fair                      |
| Bleaching liquors       |            | Yes                       |
| Borax                   | 100        | Fair                      |
| Butanol (butyl alcohol) | 100        | Yes                       |
| Butyl acetate           | 100        | Fair                      |
| Butyric acid            | 100        | Fair                      |
| Calcium carbonate       | 100        | Yes                       |
| Calcium chloride        | 100 (48°C) | Yes                       |
| Calcium hydroxide       | 100 (48°C) | Yes                       |
| Calcium nitrate         | 100 (48°C) | Yes                       |
| Carbon disulfide        |            | No                        |
| Carbon tetrachloride    |            | No                        |
| Carbonic acid           |            | Yes                       |
| Castor oil              | 100        | Yes                       |
| Chlorine water          | Saturated  | No                        |
| Chlorobenzene           | 100        | Poor                      |
| Chloroform              | 100        | Poor                      |
| (trichloro-methane)     |            |                           |
| Chromic acid            | 5          | No                        |
| Citric acid             | 100        | Yes                       |
| Copper chloride         | 100        | Yes                       |
| Copper nitrate          | 100        | Yes                       |
| Copper sulfate          |            | Yes                       |
| Cyclohexane             |            | No                        |
| Diesel fuel (DERV)      | 100        | Yes                       |
| Dimethyl formamide      | 100        | No                        |
| Ethanol (Ethyl Alcohol) | 95         | Yes                       |
| Ethanolamine            | 100        | No                        |
| Ethyl acetate           | 100        | Yes                       |
| Ethyl ether             |            | No                        |
| Ethylene glycol         | 100        | Yes                       |
| Fatty acids             |            | Yes                       |
| Ferrous chloride        | 100        | Yes                       |
| Ferrous sulfate         | 100        | Yes                       |
| Ferric chloride         | 100        | Yes                       |
| Ferric sulfate          |            | Yes                       |
| Formaldehyde            | 40         | Yes                       |
| Formic acid             | 100        | Yes                       |
| Fruit juice             |            | Yes                       |
| Fuel oil                | 100        | Yes                       |
| Gasoline (petrol)       | 100        | Fair                      |
| Glycerine               | 100        | Yes                       |
| Hydrazine               | 50         | Fair                      |
| Hydrobromic acid        | 20 / 100   | Yes / Fair                |

| Chemical medium                 | % conc     | Resistance: Polypropylene |
|---------------------------------|------------|---------------------------|
| Hydrochloric acid               | 100        | Yes                       |
| Hydrofluoric acid               | 20 / 100   | Yes / Fair                |
| Hydrogen peroxide               | 100        | Yes                       |
| Lactic acid                     | 100        | Yes                       |
| Lead acetate                    | 100        | Yes                       |
| Magnesium chloride              | 100 (48°C) | Yes                       |
| Magnesium sulfate               | 100        | Yes                       |
| Maleic acid                     | 100        | Yes                       |
| Methyl ethyl ketone (MEK)       | 100        | Yes                       |
| Motor oil                       | 100        | Yes                       |
| Nickel chloride                 | 100        | Yes                       |
| Nickel sulfate                  | 100        | Yes                       |
| Nitric acid                     | 50 / 100   | Yes / No                  |
| Nitrobenzene                    | 100        | Yes                       |
| Oleic acid                      | 100        | Yes                       |
| Oxalic acid                     | 100        | Fair                      |
| Perchloroethylene               | 100        | No                        |
| Perchloric acid                 | 10         | Yes                       |
| Phosphoric acid                 | 40         | Yes                       |
| Plating liquors                 |            | Yes                       |
| Potassium carbonate (Potash)    | 100        | Yes                       |
| Potassium chloride              | 100        | Yes                       |
| Potassium dichromate            | 100        | Yes                       |
| Potassium hydroxide             | 10         | Yes                       |
| Potassium nitrate               | 100        | Yes                       |
| Potassium permanganate          | 10         | No                        |
| Potassium sulfate               | 100        | Yes                       |
| Pyridine                        | 100 (48°C) | Yes                       |
| Sodium acetate                  | 100        | Yes                       |
| Sodium benzoate                 | 100 (48°C) | Yes                       |
| Sodium carbonate                | 35         | Yes                       |
| Sodium chlorate                 | 100        | Yes                       |
| Sodium chloride                 | 100        | Yes                       |
| Sodium hydroxide (caustic soda) | 80         | Yes                       |
| Sodium hypochlorite             | 100        | Fair                      |
| Sodium nitrate                  | 100        | Yes                       |
| Sodium peroxide                 | 100        | Yes                       |
| Sodium silicate                 | 100        | Yes                       |
| Sodium sulfate                  | 100        | Yes                       |
| Sodium sulfide                  | 100        | Yes                       |
| Sodium sulfite                  | 100 (48°C) | Yes                       |
| Sodium thiosulfate              | 100 (48°C) | Yes                       |
| Stearic acid                    | 100 (48°C) | Yes                       |
| Sulfur dioxide                  | 100        | Yes                       |
| Sulfuric acid                   | 75         | Yes                       |
| Sulfuric acid                   | >75        | No                        |
| Sulfuric acid at up to 48°C     | 10         | Yes                       |
| Tetrachloroethylene             | 100        | Yes                       |
| Tannic acid                     | 100        | Yes                       |
| Tanning liquors                 |            | Yes                       |
| Toluene                         | 100        | Fair                      |
| Trichloroacetic acid            |            | Yes                       |
| Turpentine                      | 100        | No                        |
| Urea                            |            | Yes                       |
| Urine                           |            | Yes                       |
| Water                           | (at 100°C) | Yes                       |
| Xylene                          | 100        | Yes                       |
| Zinc sulfate                    | 100        | Yes                       |



## Specification clause

The surface drainage system shall be ACO MultiDrain® (Insert channel description as appropriate e.g. ACO M100PPD) 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® PPD system will vary as the proportion of the different materials (in channels, edge rails, gratings etc) varies.

The ACO MultiDrain® PPD 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® PPD 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](http://www.thenbs.com) or [www.aco.co.uk](http://www.aco.co.uk)**

## Conformity

The ACO MultiDrain® PPD 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/DoP.php](http://www.aco.co.uk/DoP.php)), 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  
Urban + Landscape
- ACO Building Drainage
- ACO Sport
- ACO Wildlife



ISO 9001  
FM 13502



ISO 14001  
EMS 538781



OHSAS 18001  
OHS 524145

### ACO Water Management

A division of ACO Technologies plc  
ACO Business Park,  
Hitchin Road,  
Shefford,  
Bedfordshire  
SG17 5TE

Tel: 01462 816666

Fax: 01462 815895

e-mail Enquiries: [awmenquiries@aco.co.uk](mailto:awmenquiries@aco.co.uk)

e-mail Sales: [customersupport@aco.co.uk](mailto:customersupport@aco.co.uk)

e-mail Technical: [technical@aco.co.uk](mailto:technical@aco.co.uk)

website: [www.aco.co.uk](http://www.aco.co.uk)

**The ACO Group: A strong family you can depend on.**

© July 2016 ACO Technologies plc. All reasonable care has been taken in compiling the information in this document. All recommendations and suggestions on the use of ACO products are made without guarantee since the conditions of use are beyond the control of the Company. It is the customer's responsibility to ensure that each product is fit for its intended purpose, and that the actual conditions of use are suitable. This brochure and any advice is provided by ACO Technologies plc (the Company) free of charge and accordingly on terms that no liability including liability for negligence will attach to the Company or its servants or agents arising out of or in connection with or in relation to this brochure or any such advice. Any goods supplied by the Company will be supplied solely upon its standard conditions of sale, copies of which are available on request. The Company's policy of continuous product development and improvement renders specifications liable to modification. Information provided in this brochure is therefore subject to change without prior notification.

#### ACO CARES ABOUT THE ENVIRONMENT

Printed on material certificated in accordance with the rules of the FSC who provide a means of assuring that products come from responsibly managed forest.