

# ACO Water Management:

Urban + Landscape

Civils + Infrastructure

Uniclass L2123 + L7315	EPIC J3413
Cl/SfB (52.5)	

ACO Channel  
Lighting Systems



*ACO Channel Lighting Systems*

## Technical Data

## Introduction to the ACO Group

Throughout the world, the ACO brand is recognised as a leading supplier in the design, development and manufacture of surface water drainage systems.

An extensive portfolio offers the market quality solutions for every application, including internal and building drainage, landscaping, sports facilities, retail, distribution centres, highways and airports as well as solutions for environmentally sensitive projects.

The ACO Group has been manufacturing and selling market leading drainage systems for over 40 years. During this time the group has made extensive investment in global research and development and manufactures products world wide at 31 modern environmentally-sensitive production sites.



Designed with applications in mind, ACO Group surface water drainage systems are manufactured using a diverse range of materials including:

- Vienite®, ACO's high strength recycled polymer concrete
- Polymer concrete
- Steel
- Plastic
- Ductile iron





# Introduction to ACO Channel Lighting Systems

The ACO Group has developed a range of decorative combined illumination and drainage systems. These are designed to provide distinctive aesthetic accents and enhancements to architectural features and designed open spaces of all types. The systems combine the distinctive lighting feature with the efficient removal of surface water.

Architectural features such as entrances, promenades, courtyards and landscaped areas, whether public or private, can all have their appearance significantly enhanced through the creative use of ACO Channel Lighting Systems.

An overview of ACO Channel Lighting Systems is given here, while a product selector highlighting the key features of the two ranges is provided on the next page.

Additionally, this brochure provides full specification and installation details for each of the two product ranges.

## ACO Eyeleds



ACO Eyeleds is a combined domestic surface water drainage and lighting system for use in pedestrian and light vehicle applications such as patios, drives, and private parking areas.

The system consists of discreet white or blue LED spotlights installed in a durable black composite grating, which fits into a black recycled plastic channel. The ACO Eyeleds system is certified to BS EN 1433:2002 Load Class B 125.

## ACO LightPoint



ACO LightPoint is a high quality combined surface water drainage and lighting system for vehicular traffic and heavy duty applications.

White or blue LED spotlights are installed in high quality ductile iron gratings, which are available in two widths, 100mm and 200mm. A wide choice of ACO MultiDrain™ MD constant depth channels completes the system. The ACO LightPoint System is certified to BS EN 1433:2002 Load Class D 400\*.



### Further lighting systems:

Further lighting products that work in conjunction with ACO channel systems are available. For example InstaLight – a non-draining lighting system which enables clean illuminated lines. The system also utilises LED RGB technology to provide a wide variety of colour sequences to individual designs.

For more information on this system please visit [www.insta-uk.com](http://www.insta-uk.com)



# ACO Channel Lighting Systems product selector

## Making the right product selection

Two systems are available to provide efficient illuminated drainage for a range of external applications.

In order to summarise the options available, the product selector below displays key features for each of the ACO Channel Lighting Systems. The table directs you to the appropriate page once product selection has been made.

CHANNELS WITH TRADITIONAL GRATINGS		
	ACO EYELEDS	ACO LIGHTPOINT
KEY FEATURES		
CHANNEL WIDTH		 
CATCHMENT AREA	100m <sup>2</sup> *	100mm = 830m <sup>2</sup> * 200mm = 2000m <sup>2</sup> *
CHANNEL RANGE		
LOAD CLASS		
LED COLOURS	 	 
RGB TECHNOLOGY OPTION†		
TRANSFORMER SECONDARY VOLTAGE	12V DC	28V DC
LED RATING	0.3W	0.6W
TRANSFORMER CAPACITY	Max. 40 LED	Max. 18 LED
IP PROTECTION	67	67
	GO TO PAGE 5	GO TO PAGE 15

KEY		
CATCHMENT AREA	AVAILABILITY	LOAD CLASS B 125
*EXAMPLE RUN BASED ON 50m LENGTH TO OUTLET	AVAILABLE       NOT AVAILABLE	PEDESTRIAN PRECINCTS, LIGHT VEHICLES, PRIVATE DRIVES AND CAR PARKS
CHANNEL RANGE	LED COLOURS	LOAD CLASS D 400
LIMITED       SMALL       WIDE	WHITE       BLUE	PARKING AREAS FOR ALL VEHICLE TYPES. NOT SUITABLE FOR CARRIAGEWAYS OF PUBLIC ROADS OR MOTORWAYS.

† An explanation of RGB technology is given on page 16.



# ACO Eyeleds



ACO Eyeleds

ACO Eyeleds is a combined domestic drainage and lighting system for use in pedestrian and light vehicle applications.

The complete ACO Eyeled channel assembly consists of a 1m drainage channel and two 500mm ACO Eyeled gratings fitted with an LED spotlight, which is available in white or blue. Alternatively, a standard 500mm grating can be fitted to extend the gap between the spotlights.

Channels and gratings are manufactured from high strength black recycled polypropylene, which is a lightweight, robust material. The system incorporates a transformer unit to power the LEDs.

ACO EYELEDS

	Channel width <b>100mm</b>
<b>100m<sup>2</sup>*</b>	Catchment area
	Channel range <b>LIMITED</b>
	Load Class <b>B 125</b>
	LED colours
	RGB technology option
<b>12V DC</b>	Transformer secondary voltage
<b>0.3W</b>	LED rating
<b>Max. 40 LED</b>	Transformer capacity
<b>67</b>	IP protection

\*Example run based on 50m length to outlet

# ACO Eyeleds

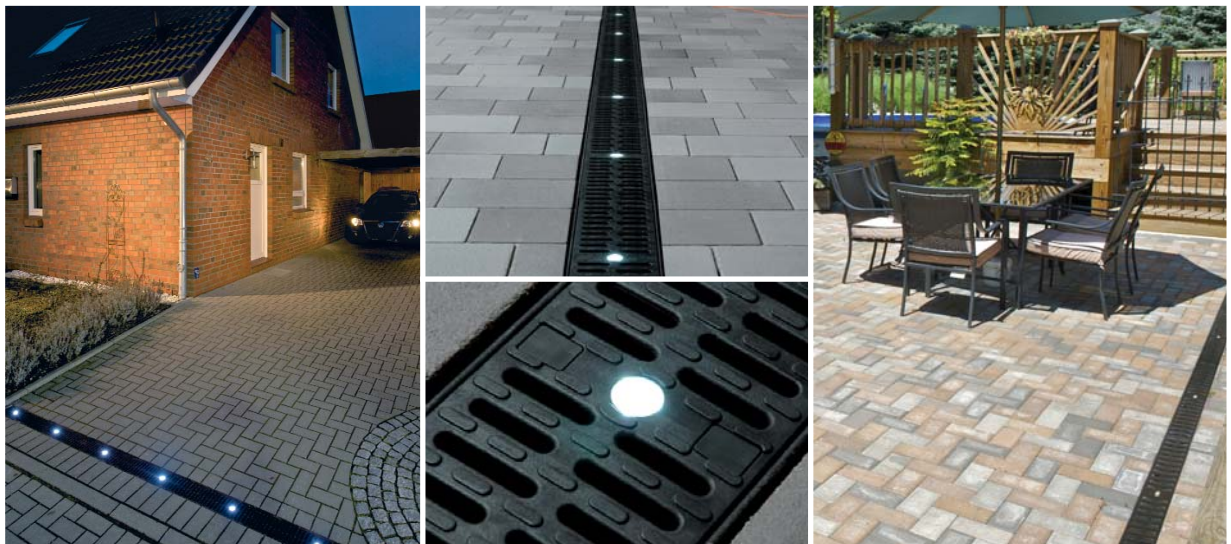
The new ACO Eyeleds channel lighting system combines attractive lighting options with efficient surface water drainage for many domestic and light duty external landscaping projects.

## What is ACO Eyeleds?

The ACO Eyeleds channel lighting system consists of a drainage channel 1m long and 100mm deep fitted with two 500mm ACO Eyeled gratings. Each ACO Eyeled grating is fitted with an LED spotlight which is available in white or blue.

All drainage components are manufactured from high strength black recycled polypropylene.

The ACO Eyeleds gratings are fitted with the ACO Drainlock™ fastening system, which provides simple and quick installation yet prevents traffic displacing the gratings.



6



## Why choose ACO Eyeleds?

The ACO Eyeleds channel lighting system can be used to attractively illuminate and enhance a wide variety of locations, including patios, drives, and private parking areas that are subject only to pedestrian or light vehicle traffic.

The high performance LED spotlights are sealed against the ingress of water and offer long working life of approx 100,000 hours. During this time the intensity of the light remains constant. The nominal voltage of the system is 12V DC and each LED spotlight is rated at 0.3W. The ACO Eyeled grating comes complete with a cable tail and M12 watertight connection, and meets IP 67 protection class.

Different grating choices mean that the system can be adapted to achieve many different lighting configurations. For instance, a standard 500mm B 125 composite grating can be used to extend the distance between individual LED spotlights.

The constant depth 1m channel is extremely robust and durable yet weighs less than 4kg thanks to ACO's unique HexTechnology™ manufacturing process. ACO Eyeleds are quick and easy to install, and channel assemblies can be simply clipped together to extend the run of the channel lighting system.

Up to forty ACO Eyeled spotlights can be connected together and powered by a single 12V transformer. A range of cable splitters, extension cables and drainage accessories is available to increase the flexibility of the system's possibilities.

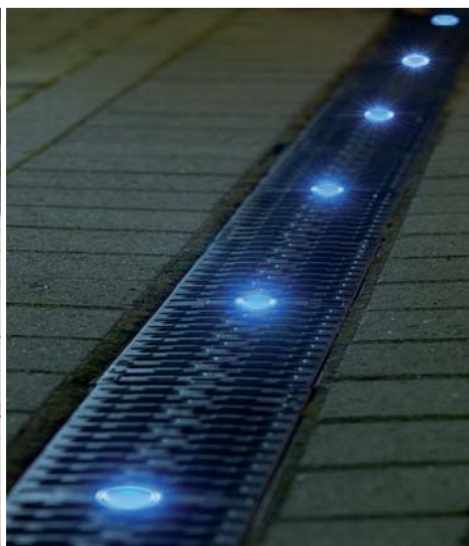
The ACO Eyeleds channel lighting system is certified to BS EN 1433: 2002 Load Class B 125.



## Typical applications

ACO Eyeleds is suitable for use in a range of pedestrian and light vehicle applications including:

- ▶ Block paved areas
- ▶ Drives
- ▶ Patios
- ▶ Paths
- ▶ Private parking areas



## Key features and benefits

- ▶ Combined domestic drainage and lighting system for a wide variety of external applications
- ▶ Suitable for use in pedestrian and light traffic areas
- ▶ Choice of white or blue LED spotlights
- ▶ Strong, robust channel and grating assembly
- ▶ Up to 40 LED spotlights per transformer
- ▶ Can enhance the aesthetic appearance of many locations
- ▶ Efficient surface water drainage system
- ▶ Grating permutations allow design versatility
- ▶ Lightweight design is simple and fast to install



If you need help with specification, design or installation, or just wish to learn more about this and other ACO Surface Water Management products, 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).

ACO EYELED FEATURES OVERVIEW



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

One LED spotlight provided per  
500mm ACO Eyed grating

Heelguard™ grating  
with 8mm slots

Channels available with 2 Eyed  
gratings or with 1 Eyed and  
1 standard B125 composite grating

100mm overall  
channel depth

Male and female channel  
connections clip together for  
quick and easy installation

Vertical knockout for  
connection to U-PVC  
pipe or sump via  
outlet connectors





Approx 100,000  
hours working life

Each ACO Eyedled grating  
comes complete with a  
watertight cable  
connection (IP67)

System CE marked and fully certified to  
BS EN 1433:2002 Load Class B 125

Full range of channel accessories  
available including end caps,  
outlet connectors and sump units

ACO Drainlock™ grating – the  
barless locking system  
improves hydraulic capacity  
and provides quick and  
simple installation of gratings

Choice of white or  
blue LED spotlights

#### LOAD CLASSES



A 15 Pedestrian, cycleways  
and domestic drives.



B 125 Pedestrian precincts,  
light vehicles, private  
car parks and drives.

## Components of the ACO Eyeleds system layout

The first layout diagram below illustrates the channel assemblies and drainage accessories available within the ACO Eyeleds range. Numerical product codes are provided after the product description for quick reference e.g. ❶ Closing end cap – 11085.

The second diagram provides a connection guide for the ACO Eyeleds lighting components.

### ACO Eyeleds channel components

❶ **Closing end cap** - 11085

❷ **Channel assemblies**

- ▶ Channel with 2 Eyeled gratings (white LED) – 11404
- ▶ Channel with 1 Eyeled grating and 1 B 125 grating (white LED) – 11405
- ▶ Channel with 2 Eyeled gratings (blue LED) – 11406
- ▶ Channel with 1 Eyeled grating and 1 B 125 grating (blue LED) – 11407

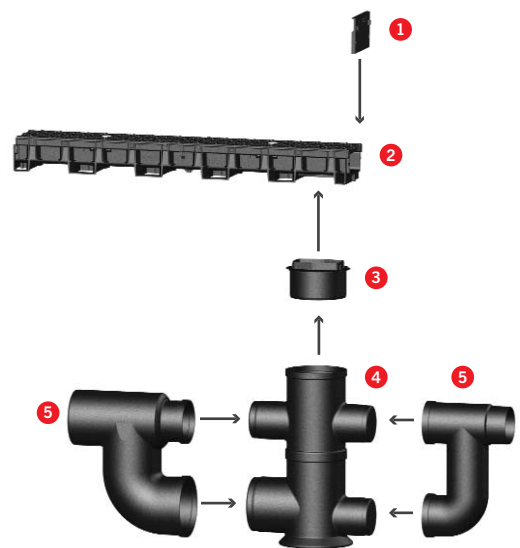
❸ **Outlet connector**

- Ø110mm connector - 11285
- Ø160mm connector – 11286

❹ **Sump unit\*** - 11385

❺ **Foul air traps**

- Ø110mm foul air trap - 11191
- Ø160mm foul air trap - 11192

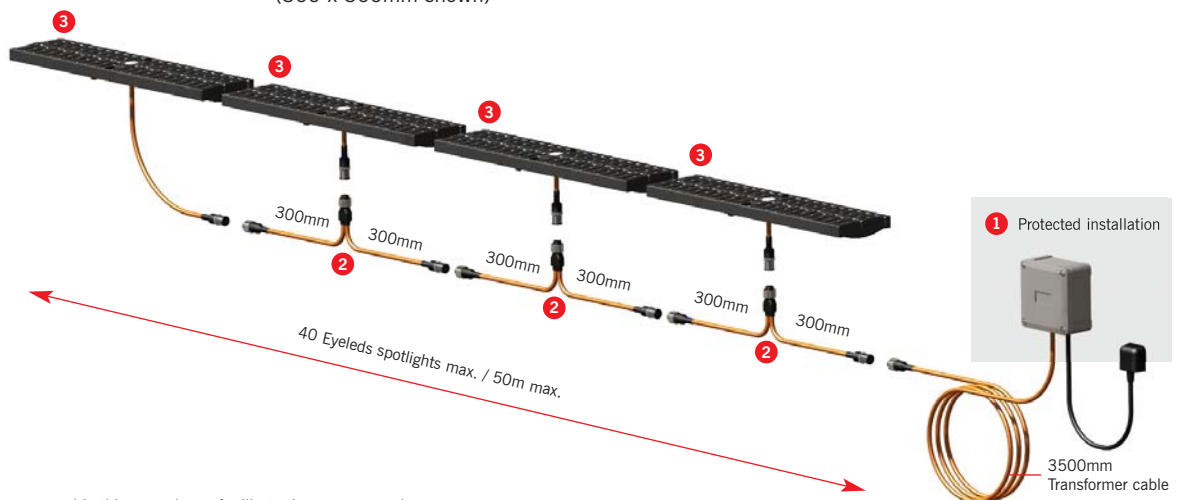


### ACO Eyeleds connection guide example

❶ **Transformer unit**

❷ **Cable splitter**  
(300 x 300mm shown)

❸ **Eyeleds 500mm long grating**



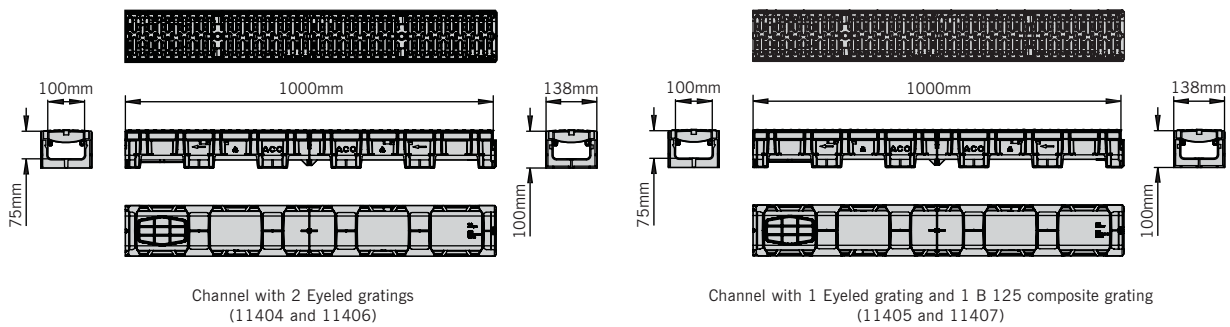
Images used in this example are for illustration purposes only

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

# ACO Eyeleds

## ACO Eyeleds channel assemblies

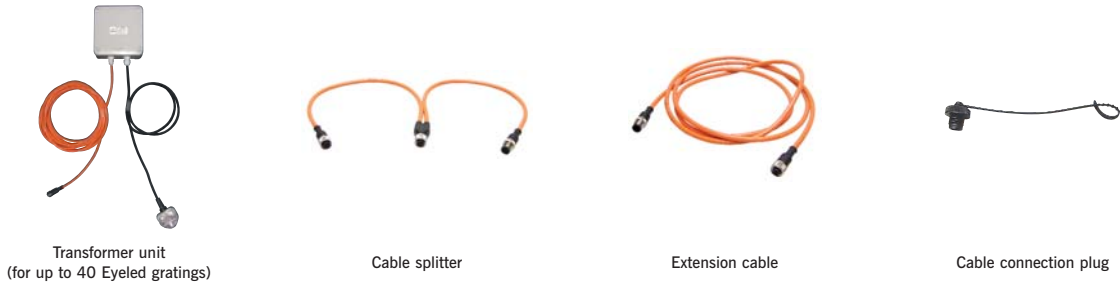
Product Code	Description	Length (mm)	Width Overall (mm)	Depth Overall (mm)	Invert depth (mm)	Weight (kg)
11404	Channel with 2 Eyeled gratings (white LED)	1000	138	100	75	3.2
11405	Channel with 1 Eyeled grating and 1 B 125 composite grating (white LED)	1000	138	100	75	3.05
11406	Channel with 2 Eyeled gratings (blue LED)	1000	138	100	75	3.2
11407	Channel with 1 Eyeled grating and 1 B 125 composite grating (blue LED)	1000	138	100	75	3.05



## ACO Eyeleds lighting accessories

Product Code	Description	Weight (kg)
12736	Transformer unit	0.51
12714	Cable splitter 300 x 300mm	0.06
12726	Cable splitter 600 x 600mm	0.08
12713	Cable splitter 300 x 1500mm	0.11
12716	Extension cable 2000mm	0.10
12715	Extension cable 5000mm	0.23
12724	Cable connection plug	0.003

Nominal voltage: 12V DC, 0.3W, Protection Class IP 67. Each LED grating comes complete with cable tail and M12 watertight connection.



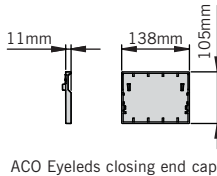
These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.



# ACO Eyeleds

## ACO Eyeleds closing end cap

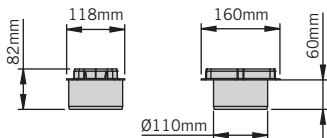
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
11085	ACO Eyeleds closing end cap	11	138	105	-	-	0.10



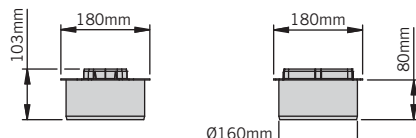
ACO Eyeleds closing end cap

## Outlet connectors

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
11285	Ø110mm vertical outlet connector	-	Ø110	60	-	-	0.10
11286	Ø160mm vertical outlet connector	-	Ø160	80	-	-	0.10



Ø110mm vertical outlet connector  
(max flow from channel 5.5 l/s)



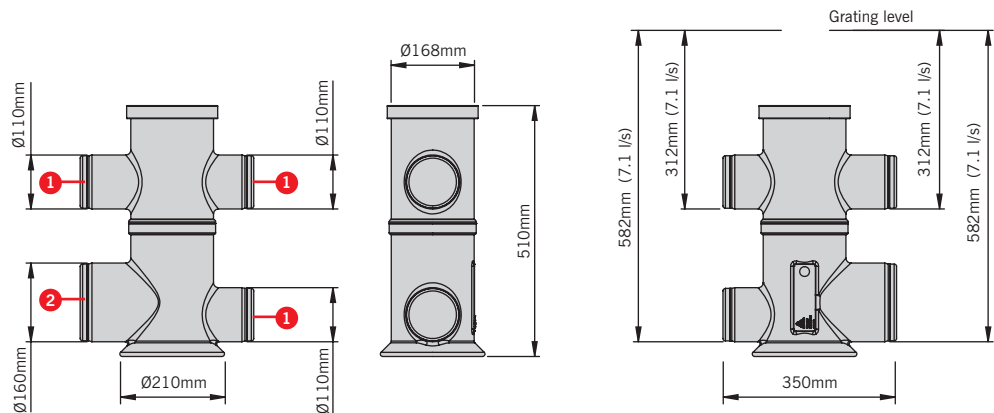
Ø160mm vertical outlet connector  
(max flow from channel 7.1 l/s)

## 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	-	3.00

Standard sump outlets

- 1 = Ø110mm outlet
- 2 = Ø160mm outlet

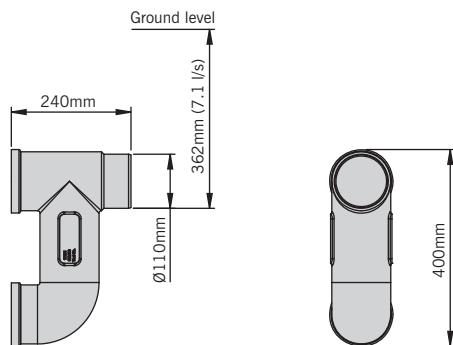


Note: For guidance on the installation of the sump unit please refer to the ACO MultiDrain™ PPD installation manual or visit [www.aco.co.uk](http://www.aco.co.uk).

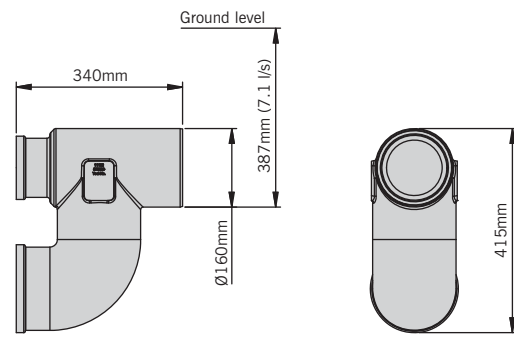
# ACO Eyeleds

## Foul air traps

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
11191	Ø110mm foul air trap	240	Ø110	400	362	-	1.20
11192	Ø160mm foul air trap	340	Ø160	415	387	-	1.40



Rodable foul air trap LLDPE Ø110mm



Rodable foul air trap LLDPE Ø160mm

## ACO Eyeleds hydraulic performance tables

### Notes for ACO Eyeleds 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 Eyeled 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	2.0	0.20	143	2.2	0.22	161	2.7	0.27	194
20	1.8	0.09	130	2.3	0.12	168	3.0	0.15	218
30	1.7	0.06	121	2.4	0.08	174	3.1	0.10	224
40	1.5	0.04	111	2.5	0.06	179	3.1	0.08	226
50	1.4	0.03	103	2.5	0.05	181	3.1	0.06	226
60	1.4	0.02	97	2.5	0.04	183	3.2	0.05	227

### 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. This team will be pleased to assist with any technical queries, scheme designs or parts schedules.

### Design a drainage system

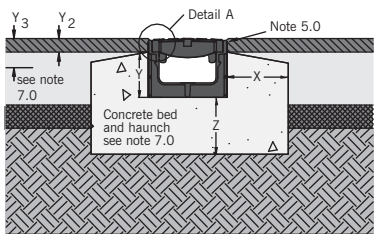
An example design method is provided on page 34 to help determine your drainage requirements.

This example will enable you to use the hydraulic performance tables on this page.

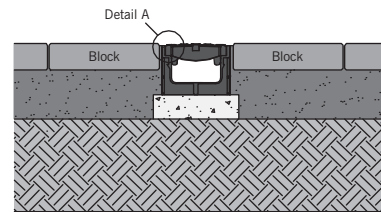
# Installation detail for ACO Eyeleds

CHANNELS WITH TRADITIONAL GRATINGS

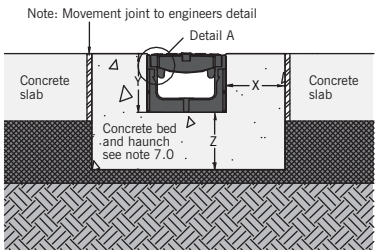
Asphalt pavement



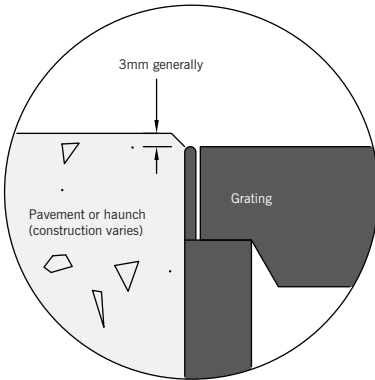
Load Class A 15



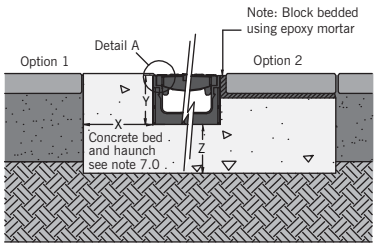
Concrete pavement



Detail A



Block paving options 1 and 2



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

1.0 Ground conditions:

The customer should ensure that the minimum dimensions shown are suitable for the existing ground conditions. Engineering advice may be necessary.

2.0 Block pavements:

The channels must be supported laterally and therefore blocks must be restrained from movement by bedding securely, e.g. by using an Epoxy or Polymer Modified Mortar for bed and perpendicular joints (for example RONAFIX Mortar Mix C or similar). Engineering advice may be required.

3.0 Surface cracks:

Alternate crack control and movement joints transversely within bed and haunch may reduce unsightly surface cracking. Engineering advice may be required.

4.0 Joint sealant:

Where ACO channel joints and fittings are to be sealed (where used in foul water applications or where impermeability is required, for example) contact a sealant specialist for guidance on the most appropriate sealing compound to use.

5.0 Surface protection:

In asphalt pavements avoid contact between compaction equipment and channel/grating. This may be achieved by ensuring that the finished surface level lies above the grating level (by at least 3mm). Stones should be removed from grating prior to laying/rolling wearing course.

6.0 General installation notes:

See ACO drawing E1-E01-003 for further notes on installation. This information is available on request or is available for download from [www.aco.co.uk](http://www.aco.co.uk). Gratings must be fitted before concreting.

Best practice and workmanship

ACO can give guidance with respect to the most suitable methods of installation for the ACO Eyeleds lighting system. ACO Eyeleds should be installed using acceptable levels of workmanship and according to the National Code of Practice (UK: BS8000: Part 14: 1989) in keeping with EN 1433:2002 (Drainage channels for vehicular and pedestrian areas).

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

7.0 Minimum dimensions of concrete surround:

For Load Class A 15, the channel is to be bedded on a suitable base according to the ground conditions. For Load Class B 125, a concrete bed and surround is required. Unless otherwise stated, all units in mm.

Dimension	Load Class	
	A 15	B 125
x	-	Min. 100
y	-	Min. 35
Y <sub>2</sub> (Asphalt pavement only)	-	Max. 25
Y <sub>3</sub> (Asphalt pavement only)	-	Max. 50
z	-	Min. 100
Minimum concrete compressive strength		25 N/mm <sup>2</sup>

8.0 Electrical work:

To be carried out by a suitably qualified person in accordance with separate installation recommendations.



# ACO LightPoint



ACO LightPoint can enhance many professionally designed landscaping applications by providing efficient and illuminated drainage.

A high quality LED spotlight is fitted in a 500mm ductile iron grating, which is used in conjunction with the ACO MultiDrain™ MD channel drainage system. ACO LightPoint LEDs are available in white or blue. A transformer unit to power the LEDs completes the system.

ACO LIGHTPOINT	
	
<div> <div>100mm</div>  </div> <div> <div>200mm</div>  </div> <div> Channel width  <b>100mm</b>  <b>200mm</b> </div>	
<div> <b>100mm = 830m<sup>2</sup>*</b>  <b>200mm = 2000m<sup>2</sup>*</b> </div> <div> Catchment area </div>	
	Channel range <b>WIDE</b>
	Load Class <b>D 400</b>
	LED colours
	RGB technology option†
<b>28V DC</b>	Transformer secondary voltage
<b>0.6W</b>	LED rating
<b>Max. 18 LED</b>	Transformer capacity
<b>67</b>	IP protection

† An explanation of RGB technology is given on page 16.

\*Example run based on 50m length to outlet

# ACO LightPoint

Whether you are an architect, specifier, landscape designer, or contractor, ACO LightPoint can enhance and add attractive definition to many public and private areas while simultaneously providing an economical solution for surface water drainage.

## What is ACO LightPoint?

The ACO LightPoint channel lighting system's central feature is a 500mm ductile iron spotlight grating designed for use with the ACO MultiDrain™ MD channel drainage system. A single LED spotlight with stainless steel surround is installed in this grating and is available in either white or blue as standard.

To produce different lighting colour combinations, RGB LEDs and lighting control technology are available to order.

The LEDs combine 3 base colours of red, green, and blue into a single unit. These base colours can be controlled separately, meaning that almost any colour of the spectrum can be generated by combining the base colours in variable permutations.

This can be used to provide lighting in colours of your own choice, or to control a lighting system which changes colour according to a sequence you define.

To provide maximum lighting and drainage options, ACO LightPoint channels and gratings are available in two widths, 100mm and 200mm. Each ACO LightPoint grating also comes complete with ACO Drainlock™, a boltless fastening system for speedy installation.



## Why choose ACO LightPoint?

The high performance LED spotlights are sealed against the ingress of water and offer long working life of approx 100,000 hours. During this time the intensity of the light remains constant. The nominal voltage of the system is 28V DC and each LED spotlight is rated at 0.6W.

The LED spotlight comes complete with a cable tail and watertight connection, and meets IP 67 protection class.

Up to eighteen ACO LightPoint spotlights can be connected together and operated from a single 28V transformer.

LED spotlights, gratings and channel components are sold individually to provide a wide choice of product combinations.

Two ACO LightPoint kits provide a range of electrical accessories which allow you to complete or extend the installation.

The use of different gratings means that the system is versatile and can be designed to meet many different lighting configurations. For example, a standard 500mm D 400 ductile iron grating can be used to extend the distance between individual LED spotlights.

All gratings within this system are finished with a high quality KTL (cathodic dip) coating.

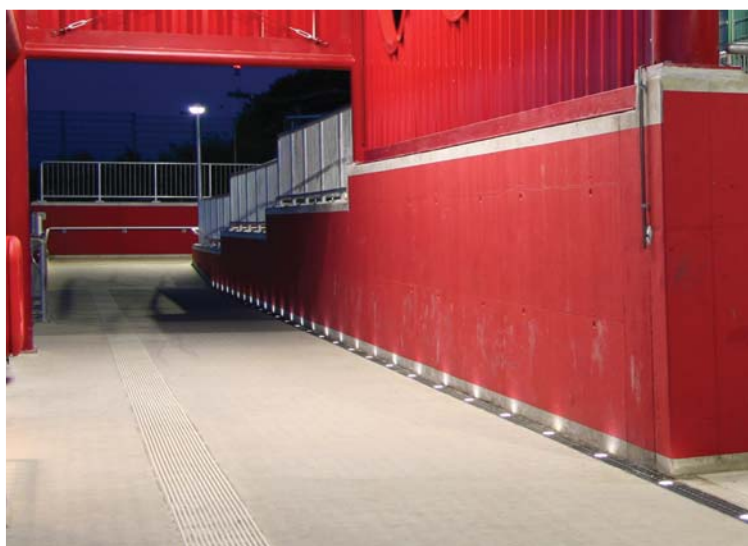
The ACO LightPoint lighting system is certified to BS EN 1433:2002 Load Class D 400\*.

## Channel drainage options

ACO MultiDrain™ MD constant depth channels provide the base required to support the ACO LightPoint grating. The channel unit is manufactured from Vienite®, ACO's high strength recycled polymer concrete, and is available in two widths and a range of constant depths. All channels are fitted with UltraSTEEL™ galvanised edge rails for improved strength and bonding between channel and surface materials.

To provide a wider choice of products, an alternative base is available for use with ACO LightPoint gratings. ACO MultiDrain™ PPD is a high strength channel drainage system manufactured from recycled polypropylene. Please refer to the ACO MultiDrain PPD Specification Manual for further details on this range.

While the characteristic of Vienite® polymer concrete and polypropylene channels are similar, ACO MultiDrain™ MD is available in a wider selection of channel depths, giving more options in design and installation.



## Typical applications

- ▶ Courtyards and piazzas
- ▶ High profile landscaped areas
- ▶ Sports and leisure facilities
- ▶ Pedestrian precincts
- ▶ Private and public parking areas
- ▶ Public and commercial buildings

## Key features and benefits

- ▶ Attractive combined lighting and drainage system for external applications
- ▶ Can enhance and add definition to many public or private areas
- ▶ Economical and efficient surface water drainage
- ▶ Choice of white or blue spotlights
- ▶ RGB LED lighting control technology available on request†
- ▶ Choice of channel and grating widths and channel depths
- ▶ Simple yet versatile system design
- ▶ Up to 18 LED spotlights per transformer

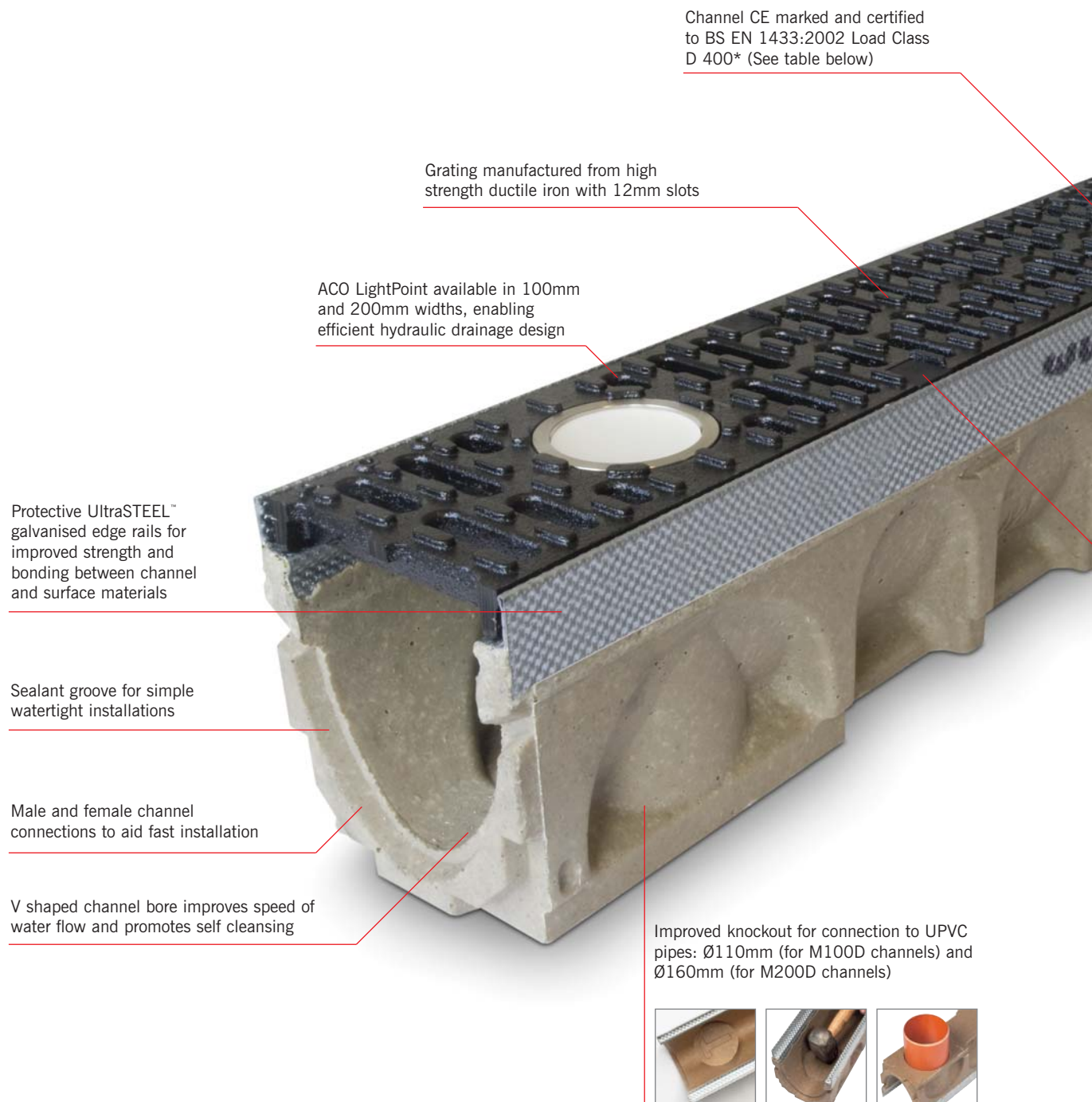


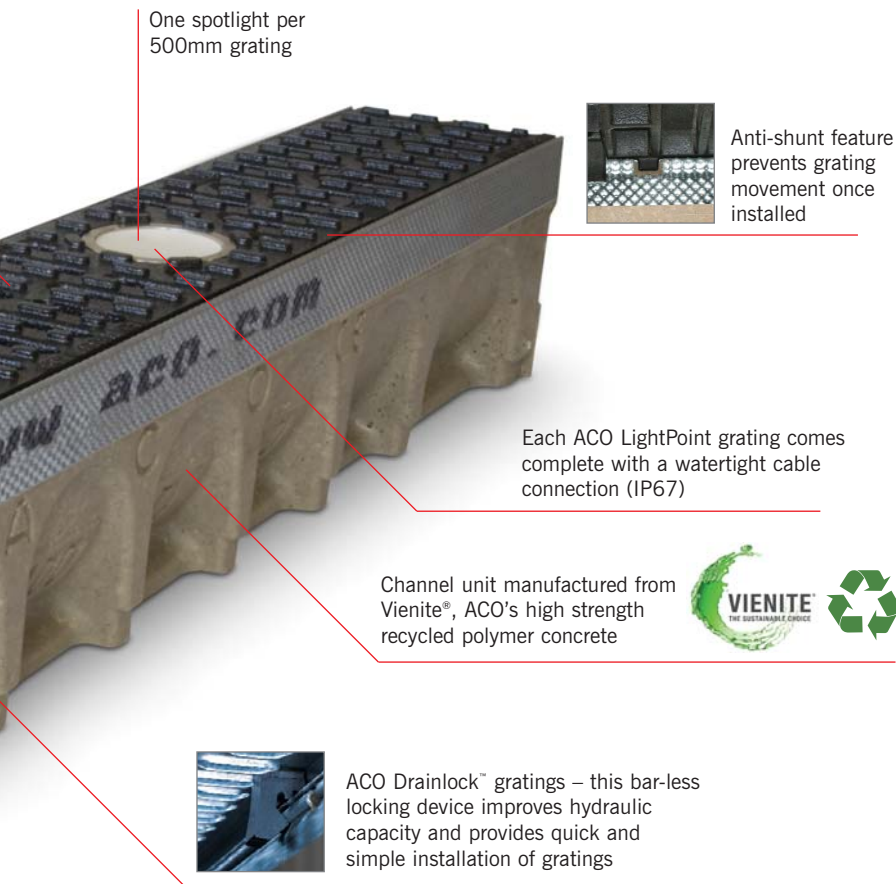
If you need help with specification, design or installation, or just wish to learn more about this and other ACO Surface Water Management products, contact our free, no obligation ACO Water Management Design Services Team who can provide advice and dedicated design support for your project – 01462 816666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

†An explanation of RGB technology is given on page 16.



## ACO LIGHTPOINT FEATURES OVERVIEW





One spotlight per 500mm grating



Anti-shunt feature prevents grating movement once installed

Each ACO LightPoint grating comes complete with a watertight cable connection (IP67)

Channel unit manufactured from Vienite®, ACO's high strength recycled polymer concrete



ACO Drainlock™ gratings – this bar-less locking device improves hydraulic capacity and provides quick and simple installation of gratings



Choice of white or blue LED spotlights

### RGB LED Lighting Technology†

For illumination of individual colours as well as a many different colour effects and sequences, LED RGB lighting technology is available upon request. Please the contact ACO Water Management Design Services Team on 01462 816666.



### LOAD CLASSES



A 15 Pedestrian, cycleways and domestic drives.



B 125 Pedestrian precincts, light vehicles, private car parks and drives.



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



D 400 Parking areas for all vehicle types\*.

\*Not suitable for carriageways of public roads or motorways

†An explanation of RGB technology is given on page 16.

### Alternative channel base available

ACO MultiDrain™ PPD is a high strength recycled polypropylene drainage unit and is suitable for use with the ACO LightPoint grating. For more information on this range of channel see the ACO MultiDrain™ PPD Specification manual. Visit [www.aco.co.uk](http://www.aco.co.uk) or call 01462 816666 to order your hard copy.



## Components of the ACO LightPoint system layout

The two channel component diagrams below illustrate the channel and drainage accessories available within the ACO LightPoint range. Numerical product codes are provided after the product description for quick reference e.g. ❶ Closing end cap – 23404.

### ACO LightPoint 100 system channel components

❶ **Closing end cap** – 23404

❷ **1m channels**

0.0 channel – 23000  
10.0 channel – 23100  
20.0 channel – 23200  
30.0 channel – 23300

❸ **0.5m channels**

0.1J\* channel – 23050  
10.1J\* channel – 23101  
20.1J\* channel – 23201  
30.1J\* channel – 23301

❹ **Drain unions**

Ø110mm drain union† – 0056  
Ø160mm drain union – 0058

❺ **Step connector**

50mm step connector – 12601

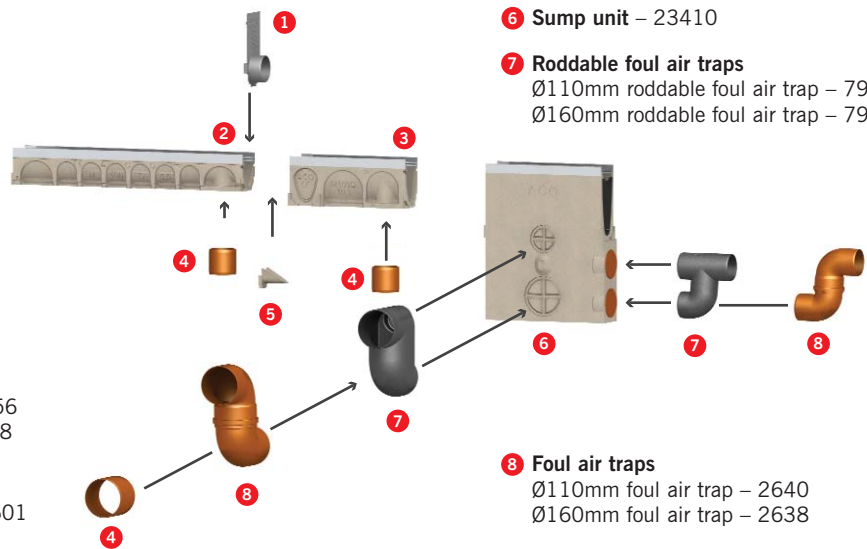
❻ **Sump unit** – 23410

❼ **Roddable foul air traps**

Ø110mm roddable foul air trap – 7931  
Ø160mm roddable foul air trap – 7932

❽ **Foul air traps**

Ø110mm foul air trap – 2640  
Ø160mm foul air trap – 2638



This second diagram provides a connection guide for the ACO LightPoint lighting components.

### ACO LightPoint connection guide example

❶ **Transformer unit**

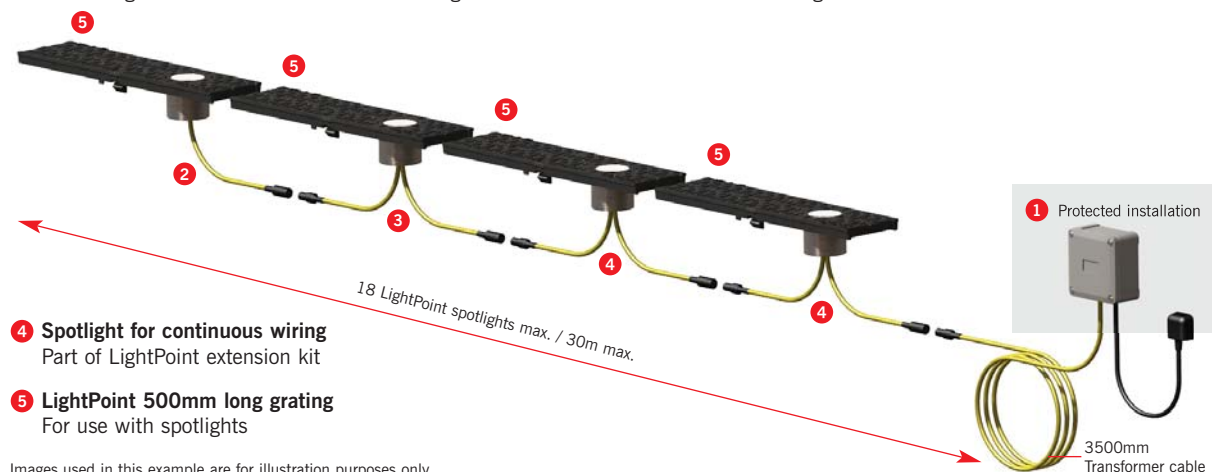
Part of LightPoint basic kit

❷ **Spotlight for terminating wiring**

Part of LightPoint basic kit

❸ **Spotlight for continuous wiring**

Part of LightPoint basic kit



Images used in this example are for illustration purposes only

## ACO LightPoint 200 system channel components

### 1 Closing end cap - 23219

### 2 1m channels

0.0 channel – 23210  
10.0 channel – 23211  
20.0 channel – 23212

### 3 0.5m channels

0.1J\* channel – 23213  
10.1J\* channel – 23214  
20.1J\* channel – 23215

### 4 Drain unions

Ø110mm drain union – 0056  
Ø160mm drain union†† – 0058  
Ø200mm drain union – 2723

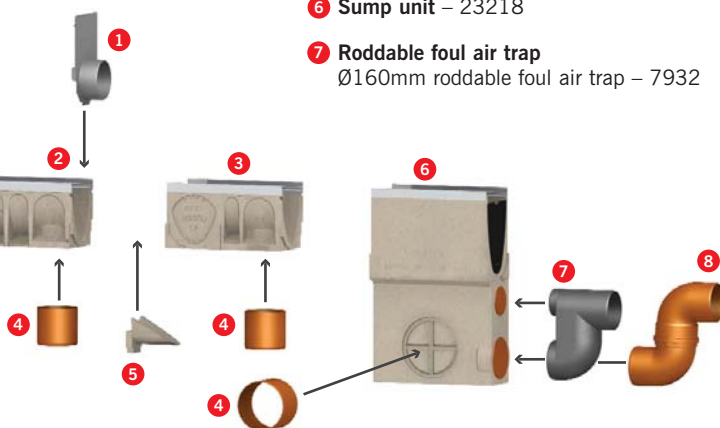
### 5 Step connector

50mm step connector – 13401

### 6 Sump unit – 23218

### 7 Roddable foul air trap

Ø160mm roddable foul air trap – 7932



### 8 Foul air trap

Ø160mm foul air trap – 2638

### 9 ACO Universal Gully

Gully assembly and bucket - 33601  
Gully assembly no bucket - 33602

For use on all ACO LightPoint systems.



### Guidance for using the ACO LightPoint parts tables

The ACO LightPoint parts tables are shown on the next pages. The product information is set out by channel width. This enables quick and simple product identification and selection.

All channels within the ACO LightPoint range are constant depth units.

† The knockout in the channel unit is for use with a Ø110mm drain union only

†† The knockout in the channel unit is for use with a Ø160mm drain union only

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



# ACO LightPoint 100 system components



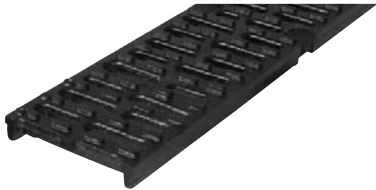
## ACO LightPoint gratings

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)
49505	MD/PPD 100 ductile iron grating for use with spotlights	500	123	21	12	35000	Yes	4.1
49506	Standard ductile iron grating not for use with spotlights	500	123	21	12	36200	Yes	4.1

Note: ACO LightPoint gratings are supplied without the LED spotlights which must be ordered separately. See table below for information.



Ductile iron grating for use with spotlights  
(Product code 49505)



Standard ductile iron grating  
(Product code 49506)

## ACO LightPoint kits and accessories

Product Code	Description	Weight (kg)
12691	ACO LightPoint basic kit with 2 white spotlights*	3.0
12692	ACO LightPoint basic kit with 2 blue spotlights*	3.0
12693	ACO LightPoint extension kit with 1 white spotlight**	1.05
12694	ACO LightPoint extension kit with 1 blue spotlight**	1.05
12695	Accessories kit***	0.2

Nominal voltage: 28V DC, 0.6W, Protection Class IP 67. Each spotlight comes complete with a watertight cable connection.



\* ACO LightPoint basic kit consists of 1 x LED spotlight for continuous wiring, 1 x LED spotlight for single or terminating wiring, 1 x transformer unit (for up to 18 spotlights), 1 x 0.65m extension cable and 3 x safety sleeves.



\*\* ACO LightPoint extension kit consists of 1 x LED spotlight for continuous wiring and 1 x safety sleeve.

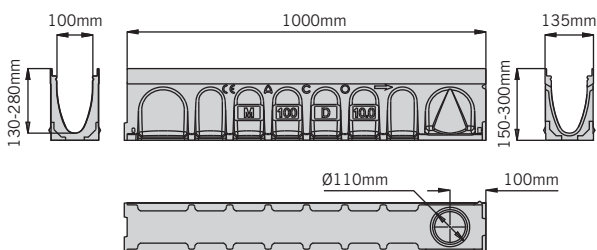


\*\*\*Accessories kit contains 1 x 0.65m extension cable and 1 x safety sleeve.

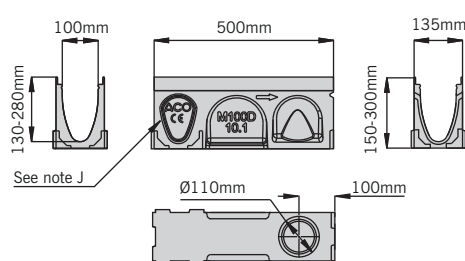
# ACO MultiDrain™ M100D channel options

## ACO MultiDrain M100D constant depth channels with UltraSTEEL™ galvanised edge rails

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23000	M100D No. 0.0*	1000	135	150	130	1/3	13.2
23050	M100D No. 0.1J*	500	135	150	130	1/3	7.6
23100	M100D No.10.0*	1000	135	200	180	1/3	16.2
23101	M100D No.10.1J*	500	135	200	180	1/3	9.2
23200	M100D No.20.0*	1000	135	250	230	1/3	19.3
23201	M100D No.20.1J*	500	135	250	230	1/3	10.8
23300	M100D No.30.0*	1000	135	300	280	1/3	22.4
23301	M100D No.30.1J*	500	135	300	280	1/3	12.5



M100D 1m constant depth channel



M100D 0.5m constant depth channel

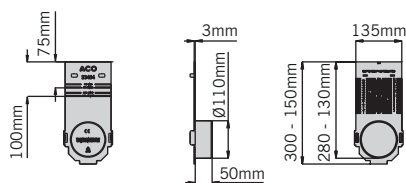
**Note:** These channels have an improved knockout feature. For details of this functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

\* Indicates channels supplied with a preformed Ø110mm knockout for vertical outlet.

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

## Multifunctional endcap (closing/inlet/outlet)

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Spigot length (mm)	Invert Type	Weight (kg)
23404	M100D No.306 universal endcap	-	135	75/300	50	-	0.16

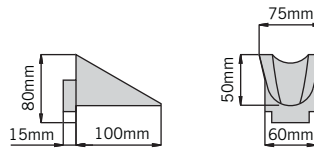


The universal end cap can be cut down to suit all M100D channels. For details of this functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

# ACO MultiDrain™ M100D channel options

## Step Connector

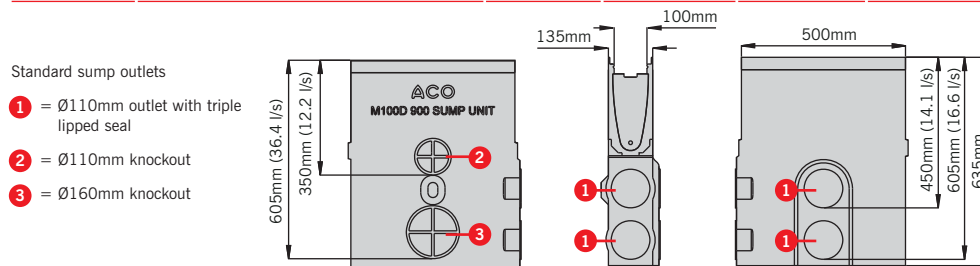
Product code	Description	Length (mm)	Width overall (mm)	Stepped depth (mm)	Invert depth (mm)	Invert Type	Weight (kg)
12601	M100D No.123 50mm step connector	100	75	50	-	-	0.4



Note: For information on the step connector functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

## Sump unit with UltraSTEEL™ galvanised edge rails

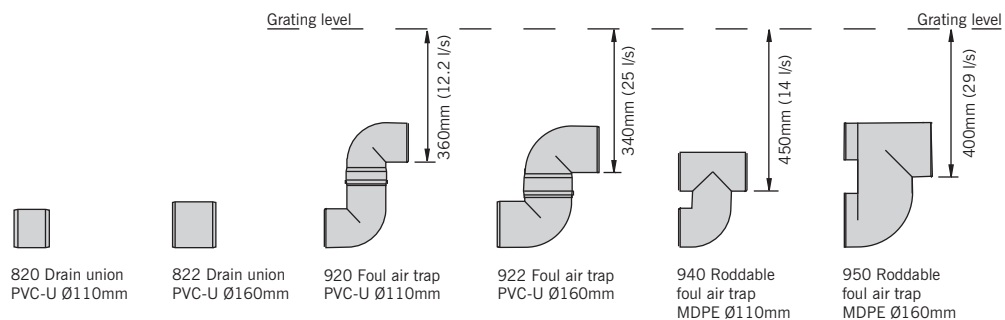
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23410	M100D universal sump with plastic silt bucket	500	135	635	615	-	32.8



Note: Drawing shows flow through un-trapped unions. For information on sump unit functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

## Foul air traps

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
0056	820 Drain union PVC – U Ø110mm (max 12.2 / 16.6 l/s)	100	110	-	350-605	-	0.14
0058	822 Drain union PVC – U Ø160mm (max 36.4 l/s)	100	160	-	605	-	0.53
2640	920 Foul air trap PVC – U Ø110mm (max 12.2 l/s)	-	110	-	360	-	0.5
2638	922 Foul air trap PVC – U Ø160mm (max 25 l/s)	-	160	-	340	-	1.9
7931	940 Roddable foul air trap MDPE Ø110mm (max 14 l/s)	-	110	-	450	-	0.56
7932	950 Roddable foul air trap MDPE Ø160mm (max 29 l/s)	-	160	-	400	-	0.83



Note: For ACO Universal Gully details please refer to page 31

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

# ACO LightPoint 100mm hydraulic performance tables

## Notes for the ACO LightPoint 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. This team will be pleased to assist with any technical queries, scheme designs or parts schedules.

## Design a drainage system

An example design method is provided on page 34 to help determine your drainage requirements.

This example will enable you to use the hydraulic performance tables on this page.

## ACO LightPoint system using M100D 0.0 150mm deep 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	4.4	0.44	318	5.0	0.50	356	5.9	0.59	428
20	4.1	0.20	292	5.3	0.27	382	6.7	0.33	480
30	3.7	0.12	266	5.6	0.19	404	7.2	0.24	515
40	3.5	0.09	252	5.8	0.14	415	7.4	0.18	531
50	3.4	0.07	243	5.9	0.12	421	7.6	0.15	545
60	3.2	0.05	229	5.9	0.10	424	7.7	0.13	553
70	3.1	0.04	223	5.9	0.08	424	7.7	0.11	557
80	3.0	0.04	218	5.9	0.07	424	7.8	0.10	559
90	3.0	0.03	214	5.9	0.07	424	7.8	0.09	560
100	3.0	0.03	214	5.9	0.06	424	7.8	0.08	561

## ACO LightPoint system using M100D 10.0 200mm deep 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	7.6	0.76	544	8.5	0.85	609	9.9	0.99	713
20	6.9	0.35	499	8.8	0.44	635	10.8	0.54	778
30	6.5	0.22	467	9.2	0.31	661	11.3	0.38	816
40	6.1	0.15	441	9.4	0.23	674	11.9	0.30	855
50	5.9	0.12	421	9.5	0.19	680	12.3	0.25	885
60	5.5	0.09	397	9.6	0.16	692	12.5	0.21	900
70	5.3	0.08	378	9.7	0.14	700	12.6	0.18	905
80	5.1	0.06	368	9.8	0.12	707	12.6	0.16	910
90	5.0	0.06	360	9.9	0.11	710	12.7	0.14	914
100	4.9	0.05	356	9.9	0.10	712	12.7	0.13	916



# ACO LightPoint 100mm hydraulic performance tables continued

## ACO LightPoint system using M100D 20.0 250mm deep channel

Length to Outlet (m)	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)
10	11.3	1.13	810	12.2	1.22	881	14.2	1.42	1024
20	10.3	0.51	739	12.8	0.64	920	15.5	0.77	1115
30	9.5	0.32	680	13.2	0.44	953	16.2	0.54	1166
40	9.0	0.23	648	13.3	0.33	959	16.6	0.41	1192
50	8.6	0.17	616	13.5	0.27	972	17.1	0.34	1231
60	8.3	0.14	595	13.6	0.23	980	17.3	0.29	1247
70	8.2	0.12	590	13.7	0.20	983	17.4	0.25	1253
80	8.1	0.10	583	13.7	0.17	986	17.5	0.22	1261
90	8.0	0.09	576	13.8	0.15	990	17.5	0.19	1261
100	7.9	0.08	569	13.8	0.14	993	17.5	0.18	1261

## ACO LightPoint system using M100D 30.0 300mm deep channel

Length to Outlet (m)	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)
10	15.3	1.53	1102	16.7	1.67	1199	18.9	1.89	1361
20	14.0	0.70	1011	17.1	0.86	1231	20.3	1.02	1464
30	13.0	0.43	933	17.3	0.58	1244	21.3	0.71	1536
40	12.2	0.31	881	17.4	0.43	1251	21.9	0.55	1574
50	11.6	0.23	833	17.6	0.35	1264	22.3	0.45	1607
60	11.1	0.18	797	17.8	0.30	1283	22.6	0.38	1628
70	10.9	0.16	785	17.9	0.26	1289	22.8	0.33	1642
80	10.7	0.13	770	18.0	0.23	1296	23.0	0.29	1652
90	10.6	0.12	765	18.1	0.20	1300	23.1	0.26	1663
100	10.6	0.11	760	18.1	0.18	1300	23.2	0.23	1670

# ACO LightPoint 200 system components



## ACO LightPoint gratings

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)
13478	MD/PPD 200 ductile iron grating for use with spotlights	500	223	30	12	71500	Yes	9.6
13477	Standard ductile iron grating not for use with spotlights	500	223	30	12	72400	Yes	11.6

Note: ACO LightPoint gratings are supplied without the LED spotlights which must be ordered separately. See table below for information.



Ductile iron grating for use with spotlights  
(Product code 13478)

Standard ductile iron grating  
(Product code 13477)

## ACO LightPoint kits and accessories

Product Code	Description	Weight (kg)
12691	ACO LightPoint basic kit with 2 white spotlights*	3.0
12692	ACO LightPoint basic kit with 2 blue spotlights*	3.0
12693	ACO LightPoint extension kit with 1 white spotlight**	1.05
12694	ACO LightPoint extension kit with 1 blue spotlight**	1.05
12695	Accessories kit***	0.2

Nominal voltage: 28V DC, 0.6W, Protection Class IP 67. Each spotlight comes complete with a watertight cable connection.



\* ACO LightPoint basic kit consists of 1 x LED spotlight for continuous wiring, 1 x LED spotlight for single or terminating wiring, 1 x transformer unit (for up to 18 spotlights), 1 x 0.65m extension cable and 3 x safety sleeves.



\*\* ACO LightPoint extension kit consists of 1 x LED spotlight for continuous wiring and 1 x safety sleeve.

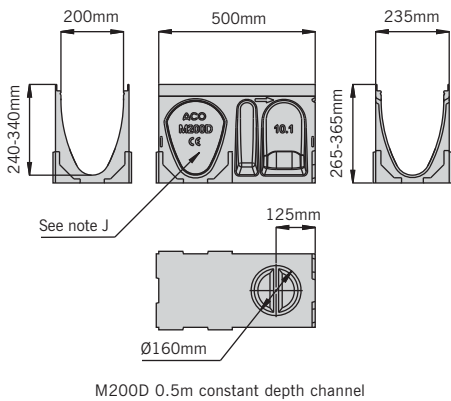
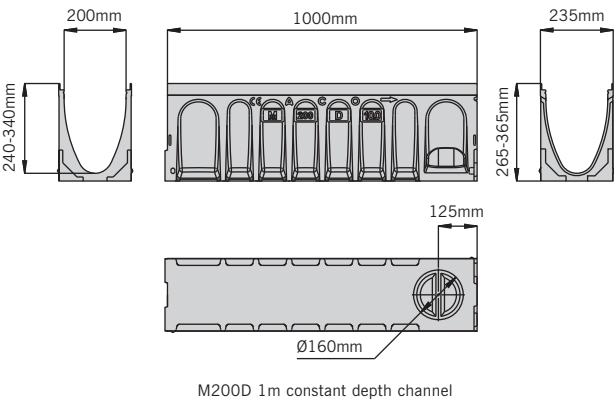


\*\*\*Accessories kit contains 1 x 0.65m extension cable and 1 x safety sleeve.

# ACO MultiDrain™ M200D channel options

## ACO MultiDrain M200D constant depth channels with UltraSTEEL™ galvanised edge rails

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23210	M200D No. 0.0*	1000	235	265	240	1/3	30.6
23213	M200D No. 0.1J*	500	235	265	240	1/3	17.9
23211	M200D No.10.0*	1000	235	315	290	1/3	34.2
23214	M200D No. 10.1J*	500	235	315	290	1/3	19.9
23212	M200D No.20.0*	1000	235	365	340	1/3	37.7
23215	M200D No. 20.1J*	500	235	365	340	1/3	21.9



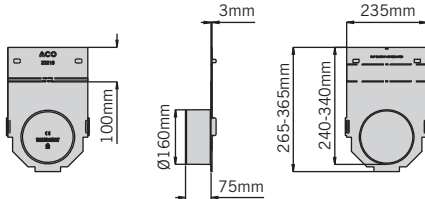
**Note:** These channels have an improved knockout feature. For details of this functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

\* Indicates channels supplied with a preformed Ø160mm knockout for vertical outlet.

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

## Multifunctional endcap (closing/inlet/outlet)

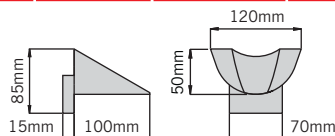
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Spigot length (mm)	Invert Type	Weight (kg)
23219	M200D No. 306 universal endcap	-	235	100/365	75	-	0.4



# ACO MultiDrain™ M200D channel options

## Step connector

Product code	Description	Length (mm)	Width overall (mm)	Stepped depth (mm)	Invert depth (mm)	Invert Type	Weight (kg)
13401	M200D No.123 50mm step connector	100	150	50	-	-	0.6



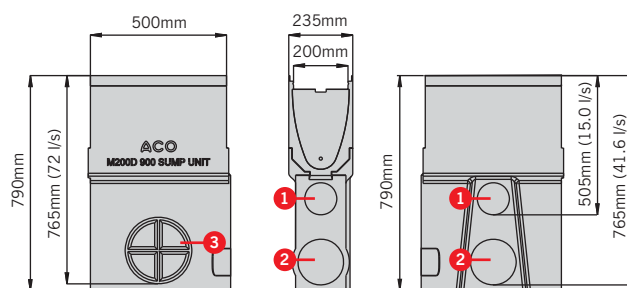
Note: For information on the step connector functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

## Sump unit with UltraSTEEL™ galvanised edge rails

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
23218	M200D universal sump with plastic silt bucket	500	135	790	765	-	47

Standard sump outlets

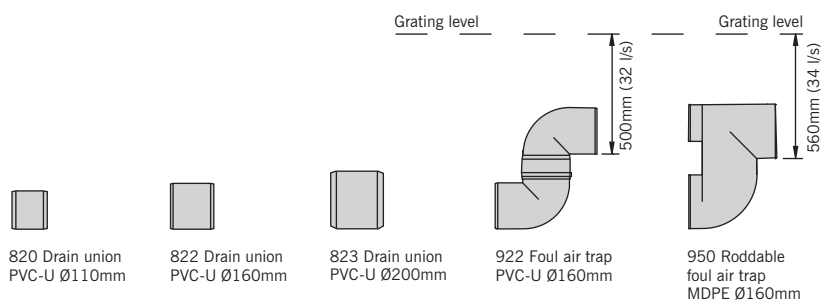
- 1 = Ø110mm outlet with triple lipped seal
- 2 = Ø160mm outlet with triple lipped seal
- 3 = Ø200mm knockout



Note: Drawing shows flow through un-trapped unions. For information on sump unit functionality, please refer to ACO MultiDrain™ MD technical brochure or visit [www.aco.co.uk](http://www.aco.co.uk).

## Foul air traps

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
0056	820 Drain union PVC – U Ø110mm (max 15.0 l/s)	100	110	-	505	-	0.14
0058	822 Drain union PVC – U Ø160mm (max 41.6 l/s)	100	160	-	765	-	0.53
2723	823 Drain Union PVC- U Ø200mm (max 72 l/s)	200	200	-	765	-	0.6
2638	922 Foul air trap PVC – U Ø160mm (max 32 l/s)	-	160	-	500	-	1.9
7932	950 Roddable foul air trap MDPE Ø160mm (max 34 l/s)	-	160	-	560	-	0.83



Note: For ACO Universal Gully details please refer to page 31.

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



# ACO LightPoint 200mm hydraulic performance tables

## Notes for the ACO LightPoint 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. This team will be pleased to assist with any technical queries, scheme designs or parts schedules.

## Design a drainage system

An example design method is provided on page 34 to help determine your drainage requirements.

This example will enable you to use the hydraulic performance tables on this page.

### ACO LightPoint system using M200D 0.0 260mm deep 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	23.8	2.38	1710	26.3	2.63	1895	30.6	3.06	2200
20	22.9	1.15	1651	29.0	1.45	2087	35.0	1.75	2519
30	21.7	0.72	1562	30.6	1.02	2200	37.6	1.25	2710
40	21.2	0.53	1524	31.9	0.80	2297	40.0	1.00	2877
50	20.3	0.41	1460	32.8	0.66	2358	41.8	0.84	3010
60	19.9	0.33	1431	33.6	0.56	2418	42.8	0.71	3083
70	19.2	0.27	1382	34.4	0.49	2474	44.0	0.63	3168
80	18.9	0.24	1363	34.7	0.43	2499	44.9	0.56	3230
90	18.2	0.20	1309	35.2	0.39	2532	45.4	0.50	3270
100	17.9	0.18	1290	35.4	0.35	2547	46.0	0.46	3311
120	17.2	0.14	1236	36.1	0.30	2597	46.9	0.39	3375
140	16.5	0.12	1188	36.4	0.26	2622	47.4	0.34	3411
160	15.8	0.10	1140	36.9	0.23	2654	47.5	0.30	3421
180	15.1	0.08	1085	37.1	0.21	2671	47.6	0.26	3429
200	14.8	0.07	1063	37.3	0.19	2683	47.7	0.24	3434

### ACO LightPoint system using M200D 10.0 310mm deep 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	32.1	3.21	2310	36.8	3.68	2650	42.4	4.24	3050
20	31.1	1.55	2237	38.5	1.93	2773	45.8	2.29	3300
30	30.0	1.00	2160	40.7	1.36	2930	49.2	1.64	3540
40	28.9	0.72	2081	41.9	1.05	3017	52.2	1.31	3758
50	27.6	0.55	1990	42.9	0.86	3090	54.2	1.08	3900
60	27.2	0.45	1956	44.1	0.74	3176	55.5	0.93	3997
70	26.3	0.38	1890	44.7	0.64	3220	56.9	0.81	4100
80	25.8	0.32	1856	45.3	0.57	3261	57.9	0.72	4168
90	25.1	0.28	1810	45.7	0.51	3290	58.8	0.65	4230
100	24.6	0.25	1769	46.2	0.46	3324	59.7	0.60	4296
120	23.4	0.20	1687	46.9	0.39	3375	60.9	0.51	4386
140	22.4	0.16	1615	47.5	0.34	3420	62.1	0.44	4472
160	21.9	0.14	1576	48.0	0.30	3453	62.8	0.39	4520
180	21.1	0.12	1516	48.3	0.27	3476	63.7	0.35	4584
200	20.3	0.10	1464	48.4	0.24	3486	64.3	0.32	4627

### ACO LightPoint system using M200D 20.0 360mm deep 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	41.5	4.15	2990	46.8	4.68	3370	53.1	5.31	3820
20	40.2	2.01	2891	48.8	2.44	3516	57.4	2.87	4130
30	38.5	1.28	2770	51.3	1.71	3690	61.1	2.04	4400
40	37.3	0.93	2685	52.7	1.32	3795	64.6	1.61	4650
50	36.0	0.72	2590	53.6	1.07	3860	66.9	1.34	4820
60	35.2	0.59	2531	55.0	0.92	3958	68.8	1.15	4953
70	33.8	0.48	2430	56.1	0.80	4040	70.0	1.00	5040
80	33.3	0.42	2400	56.7	0.71	4080	71.6	0.90	5158
90	32.4	0.36	2333	57.5	0.64	4140	72.6	0.81	5230
100	31.8	0.32	2287	57.9	0.58	4167	73.5	0.74	5294
120	30.5	0.25	2193	58.5	0.49	4215	75.4	0.63	5428
140	29.1	0.21	2097	59.0	0.42	4246	76.6	0.55	5516
160	28.4	0.18	2042	59.5	0.37	4282	77.6	0.49	5588
180	27.4	0.15	1971	59.8	0.33	4304	78.4	0.44	5645
200	26.6	0.13	1918	60.1	0.30	4329	79.0	0.40	5689

# ACO Universal Gully

## ACO Universal Gully

The ACO Universal Gully provides fast and simple connection between any channel size up to 200mm width in the ACO channel drainage range. It also provides an outlet to connect to traditional underground drainage.

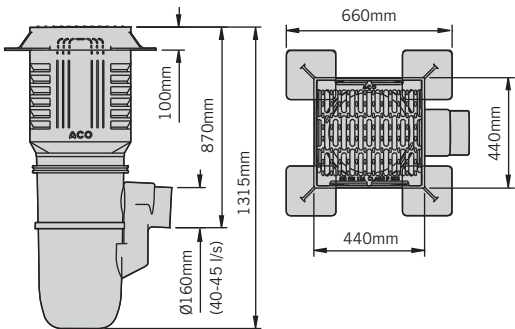
The ACO Universal Gully is a recycled plastic modular system with a ductile iron grating and frame.

Instructions for this gully can be found on page 33.

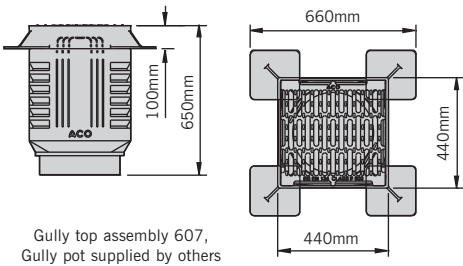


## ACO Universal Gully and accessories

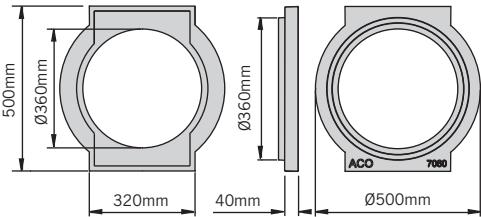
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Invert Type	Weight (kg)
33601	Gully assembly and bucket 601	440	440	1315	870	-	78.80
33602	Gully assembly no bucket 602	440	440	1315	870	-	77.40
33607	Gully top assembly 607	440	440	650	-	-	73.10
33605	Base unit 605	Ø375	Ø375	750	310	-	4.30
33603	Intermediate unit 603	440	440	515	-	-	5.10
33604	Grating and frame 604	440	440	100	-	-	69.50
7060	Connector 615	500	Ø500	40	-	-	7.00
33606	Bucket polyethylene	Ø275	Ø275	250	-	-	1.40



Gully assembly 601 and 602



Gully top assembly 607,  
Gully pot supplied by others



Connector 615

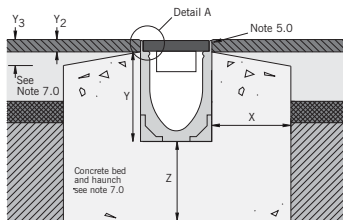
Note: Plain U-PVC 150mm – 160mm SuperSleeve adaptor supplied with 601, 602 and 605 assembly. Grating slot width 19mm.

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

# Installation detail for ACO LightPoint

## CHANNELS WITH TRADITIONAL GRATINGS

### Asphalt pavement



#### 1.0 Ground conditions:

The customer should ensure that the minimum dimensions shown are suitable for the existing ground conditions. Engineering advice may be necessary.

#### 2.0 Block pavements:

The channels must be supported laterally and therefore blocks must be restrained from movement by bedding securely, e.g. by using an Epoxy or Polymer Modified Mortar for bed and perpendicular joints (for example RONAFIX Mortar Mix C or similar). Engineering advice may be required.

#### 3.0 Surface cracks:

Alternate crack control and movement joints transversely within bed and haunch may reduce unsightly surface cracking. Engineering advice may be required.

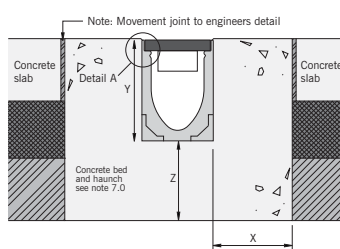
#### 4.0 Joint sealant:

Where ACO channel joints and fittings are to be sealed (where used in foul water applications or where impermeability is required, for example) contact a sealant specialist for guidance on the most appropriate sealing compound to use.

#### 5.0 Surface protection:

In asphalt pavements avoid contact between compaction equipment and channel/grating. This may be achieved by ensuring that the finished surface level lies above the grating level (by at least 3mm). Stones should be removed from grating prior to laying/rolling wearing course.

### Concrete pavement



#### 6.0 General installation notes:

See ACO drawing E1-E01-003 for further notes on installation. This information is available on request or is available for download from [www.aco.co.uk](http://www.aco.co.uk). Gratings must be fitted before concreting.

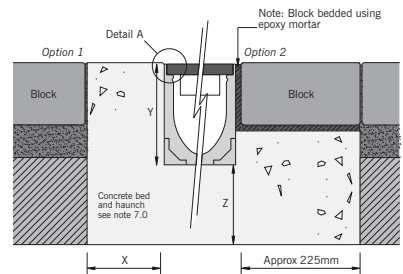
For installation of the ACO LightPoint system using ACO MultiDrain™ PPD channels see drawing E1-E01-045-3 which is available on request or to download from the ACO website. Visit [www.aco.co.uk](http://www.aco.co.uk) for more information.

#### Best practice and workmanship

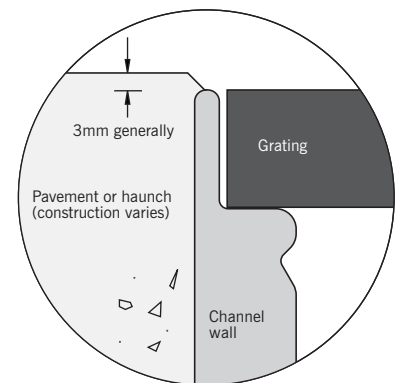
ACO can give guidance with respect to the most suitable methods of installation for the ACO LightPoint lighting system. ACO LightPoint should be installed using acceptable levels of workmanship and according to the National Code of Practice (UK: BS8000: Part 14: 1989) in keeping with EN 1433:2002 (Drainage channels for vehicular and pedestrian areas).

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

### Block paving options 1 and 2



#### Detail A



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

#### 7.0 Minimum Dimensions of Concrete Surround

For Load Class A 15, the channel is to be bedded on a suitable base according to the ground conditions. For Load Classes B 125 to D 400\*, a concrete bed and surround is required. Unless otherwise stated, all units in mm.

Dimension	Load Class			
	A 15	B 125	C 250	D 400*
x	100	150	150	200
y	Full depth of channel (Less Y <sub>2</sub> if necessary)			
Y <sub>2</sub> +	35	35	35	35
Y <sub>3</sub>	100	60	60	60
z	100	150	150	200
Minimum concrete compressive strength	25 N/mm <sup>2</sup>		25 N/mm <sup>2</sup>	30 N/mm <sup>2</sup>

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

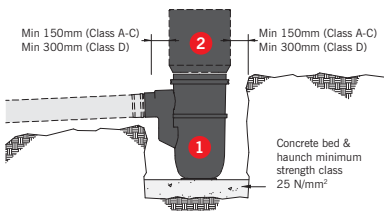
+Note dashed line printed on edge rails 35mm below top.

#### 8.0 Electrical work:

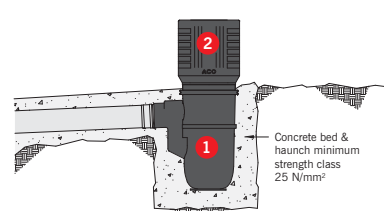
To be carried out by a suitably qualified person in accordance with separate installation recommendations.

## Installation notes:

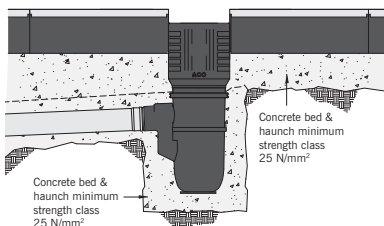
**A.** Excavate a 150mm bed and surround, blind where necessary. Form concrete\* bed for base unit **1** and set on a mortar (or similar) levelling bed. Make pipe connections (PVCu or SuperSleeve) as appropriate.



**B.** Concrete\* around base unit **1** and pipes if required. Position gully intermediate unit **2** to level.



**C.** Concrete\* bed for channels allowing levelling mortar bed if required. Extend concrete bed around **2** (see fig. 1). Install channels (see separate channel installation recommendations) with taped external joints at junction of unit **2** and end of channels.



**D.** Complete concrete\* surround to unit **2** allowing for frame levelling bed. Cut out knock outs on gully frame **3** and cut profile of the channel from inside of unit **2**. Install gully and haunch concrete\* to the sides of channels as recommended in separate channel installation recommendations.

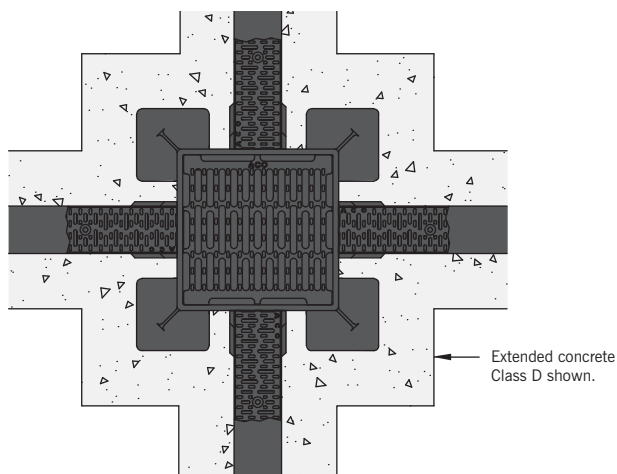
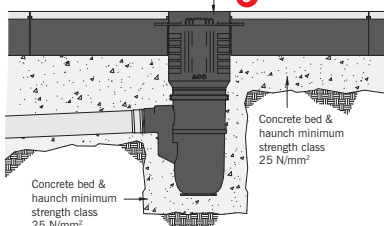


Fig 1:  
Shutter around gully top 200mm (Class D) or 150mm (Class A-C). Concrete\* the supporting surround for the gully frame.

## General notes:

### 1.0 Ground conditions:

The customer should ensure that the minimum dimensions shown are suitable for the existing ground conditions. Engineering advice may be necessary.

### 2.0 Block pavements:

The channel must be supported laterally and therefore blocks must be restrained from movement by bedding securely, e.g. by using an Epoxy or Polymer Modified Mortar for bed and perpendicular joints (for example RONAFIX Mortar Mix C or similar from Ronacrete, tel 01279 638700). Engineering advice may be required.

### 3.0 Surface cracks:

Alternate crack control and movement joints transversely within bed and haunch may reduce unsightly surface cracking. Engineering advice may be required.

### 4.0 Joint sealant:

Where ACO channel joints and fittings are to be sealed (where used in foul water applications or where impermeability is required, for example) contact a sealant specialist for guidance on the most appropriate sealing compound to use.

### 5.0 Surface protection:

In asphalt pavements avoid contact between compaction equipment and channel/grating. This may be achieved by ensuring that the finished surface level lies above the grating level (by at least 3mm). Stones should be removed from grating prior to laying/rolling wearing course.

### 6.0 General installation notes:

See ACO drawing E1-E01-003 for further notes on installation. This information is available on request or is available for download from [www.aco.co.uk](http://www.aco.co.uk). Gratings must be fitted before concreting.

### 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 range should be installed using acceptable levels of workmanship and according to the National Code of Practice (UK: BS8000: Part 14: 1989) in keeping with EN 1433:2002 (Drainage channels for vehicular and pedestrian areas).

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

\* Refer to note 7.0 on page 32.



An electronic version of the ACO Universal Gully installation detail is available to download from the ACO website. Visit [www.aco.co.uk](http://www.aco.co.uk).



# Designing a drainage system

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.

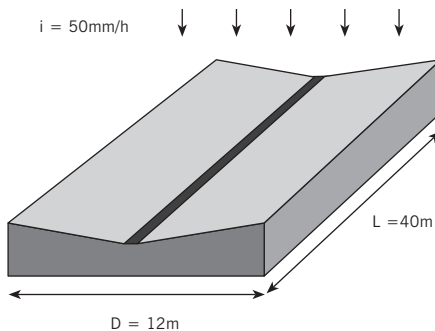
For detailed designs using Hydro, please contact the ACO Water Management Design Services Team. This team should also be consulted for advice where the inflow is not uniformly distributed along the channel.

The hydraulic performance tables within the relevant sections have been produced from the ACO Hydro software to facilitate a quick manual design method for the determination of drainage requirements.

The columns of drainage catchment area ( $A \text{ m}^2$ ) are based on a rainfall intensity of 50mm/h, but can be adapted for use at any rainfall intensity. The columns of maximum flow rate ( $Q \text{ l/s}$ ) and maximum lateral inflow ( $q \text{ l/s/m}$ ) can be used at any rainfall intensity.



## DESIGN EXAMPLE



For a design of ACO LightPoint using M100D channel, assume the following figures:

$D = 15\text{m}$  (depth of catchment area)

$L = 40\text{m}$  (length of channel run = length of catchment)

$i = 50\text{mm/h}$  (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

$$\text{Area} = L \times D = 40 \times 12 = 480\text{m}^2$$

For a quick analysis, see the tables and the columns for area on pages 25 and 26.

480m<sup>2</sup> is too large for one 40m run of ACO MultiDrain™ M100D 0.0.

However a 20m run can drain 292m<sup>2</sup>, so one central outlet will work, with 20m of channel each side, each draining 240m<sup>2</sup>.

Alternatively, for one end outlet, the M100D 30.0 channel can drain 881m<sup>2</sup> when the length is 40m, so the M100D 30.0 channel will be suitable.

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

### 2. Determine total flow (Q)

$$Q = (\text{area} \times i) / 3600 = (480 \times 50) / 3600 = 6.67 \text{ l/s}$$

### 3. Determine lateral inflow (q)

$$q = Q / L = 6.67 / 40 = 0.167 \text{ l/s/m}$$

### 4. Determine suitable channel sizes and lengths

ACO MultiDrain™ M100D 0.0 at 20m and 30m could carry 0.208 l/s/m.

Alternatively use ACO MultiDrain™ M100D 30.0 to an end outlet, where the tables show that 40m can carry 12.2 l/s and drain 881m<sup>2</sup>.

### 5. Check outlet capacity

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

## Model Specifications:

### ACO Eyeleds

ACO Eyeleds lighting system to Load Class B 125 (BS EN 1433) to include ACO recycled polypropylene channel nominally 100mm wide and 100mm deep and Eyeleds HeelGuard gratings 500mm long with DrainLock fixing incorporating 0.3W / 25mA LED spotlights colour [white or blue] # every [500mm or 1000mm or other as required] # and 240V AC / 12V DC power supply unit and all necessary cables and connections to be supplied and installed in accordance with the manufacturer's recommendations.

# insert the required option

### ACO LightPoint

ACO LightPoint lighting system for installation on ACO [MultiDrain M100D / MultiDrain M200D / MultiDrain M100PPD / MultiDrain M200PPD]# channels detailed elsewhere, to include ductile iron HeelGuard gratings to Load Class D400 (BS EN 1433) with 0.6W / 21mA LED spotlights colour [white or blue]# every [500mm or 1000mm or other as required]# and 240V AC / 28V DC power supply unit and all necessary cables and connections to be supplied and installed in accordance with the manufacturer's recommendations.

# insert the required option

### NBS Specifications

ACO Eyeleds and ACO LightPoint should be specified in section R12:421. 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)

## RECYCLED CONTENT

ACO Technologies aims to incorporate as much recycled material or waste material as is practicable in its manufactured products.

ACO Viente® and plastic materials contain in excess of 20% recycled content by weight. Typically, cast iron materials contain 40% to 90% recycled iron, and steel products contain 25% to 33% recycled steel.

### ACO Eyeleds

The total recycled content of the ACO Eyeleds channel and grating system will contain at minimum approximately 23% by weight recycled material. ACO Eyeleds 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.

### ACO LightPoint

The total recycled content of the ACO LightPoint system will vary as the proportion of different materials (channel base) varies. As an example the ACO LightPoint gratings with ACO MultiDrain™ M100D channel base will contain at minimum 25% by weight recycled material. ACO LightPoint 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.

## Conformity

The ACO Eyeleds and ACO LightPoint channel lighting systems are CE marked and fully certified to BS EN 1433:2002.

Test certificates and a declaration of conformity are available on request. Please contact the ACO Water Management Design Services Team on 01462 816666 for further information.

### BS EN 1433:2002



## ACO Technologies plc

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

### ACO Water Management: Urban + Landscape Civils + Infrastructure

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

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