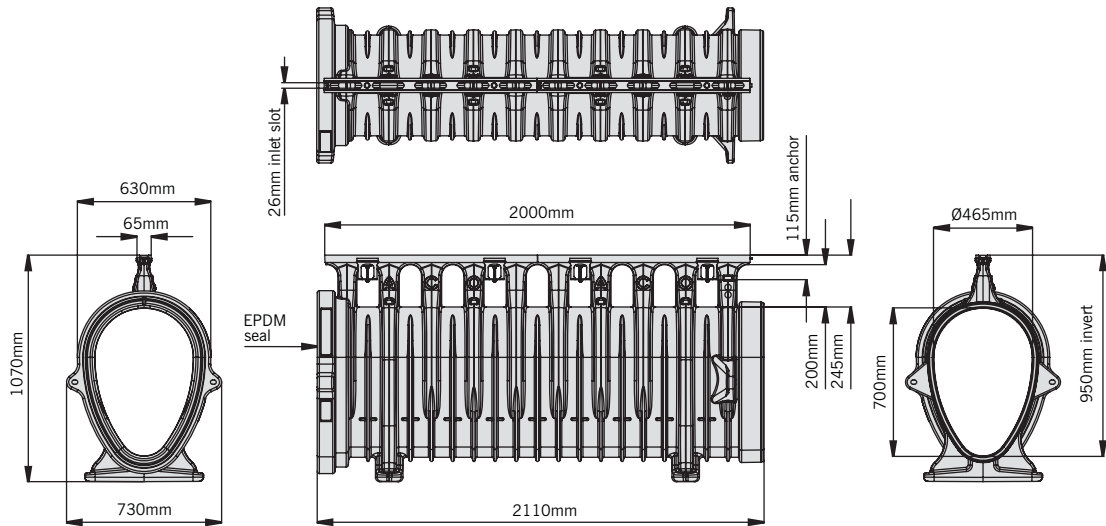


ACO Qmax® 700

ACO Qmax® 700 with ACO Q-Flow ductile iron edge rail

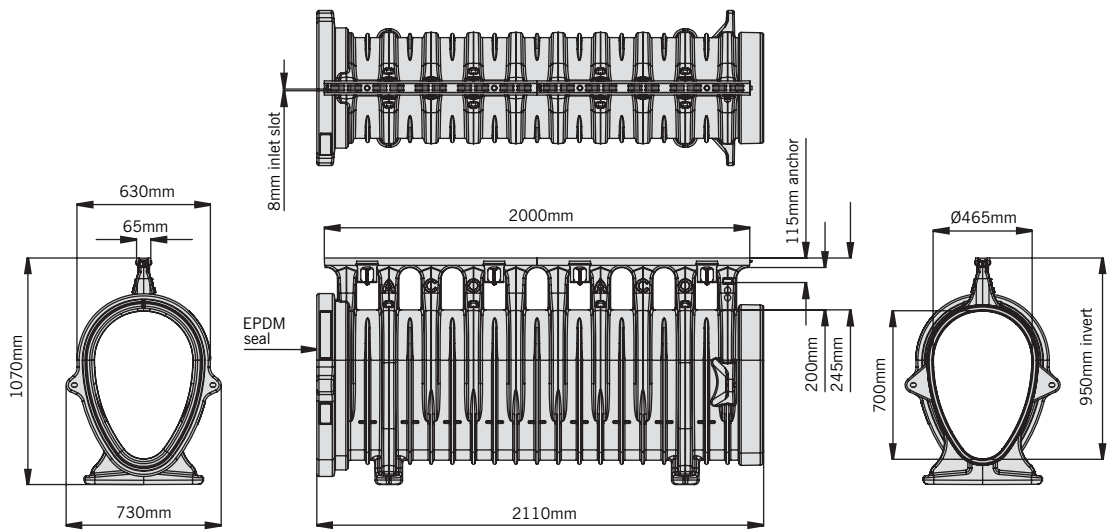
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32830	ACO Qmax® 700 channel assembly complete with ACO Q-Flow ductile iron edge rail	2000	730	1070	26	49.7



ACO Qmax® 700 with ACO Q-Flow ductile iron edge rail

ACO Qmax® 700 with ACO Q-Guard ductile iron edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32831	ACO Qmax® 700 channel assembly complete with ACO Q-Guard ductile iron edge rail	2000	730	1070	2 x 8	50.7



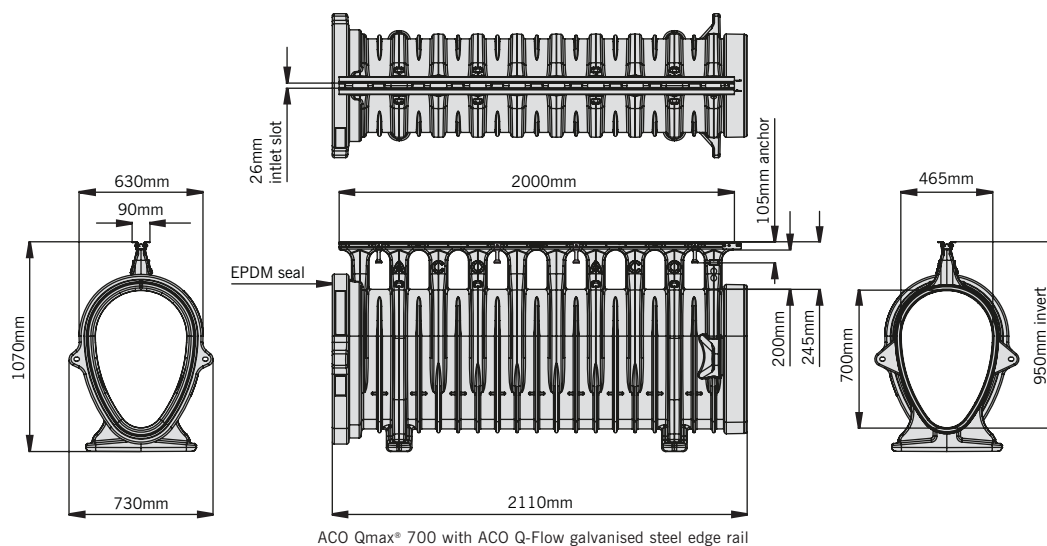
ACO Qmax® 700 with ACO Q-Guard ductile iron edge rail

Note: For details regarding the access/silt chambers for use with this system please refer to page 53.

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

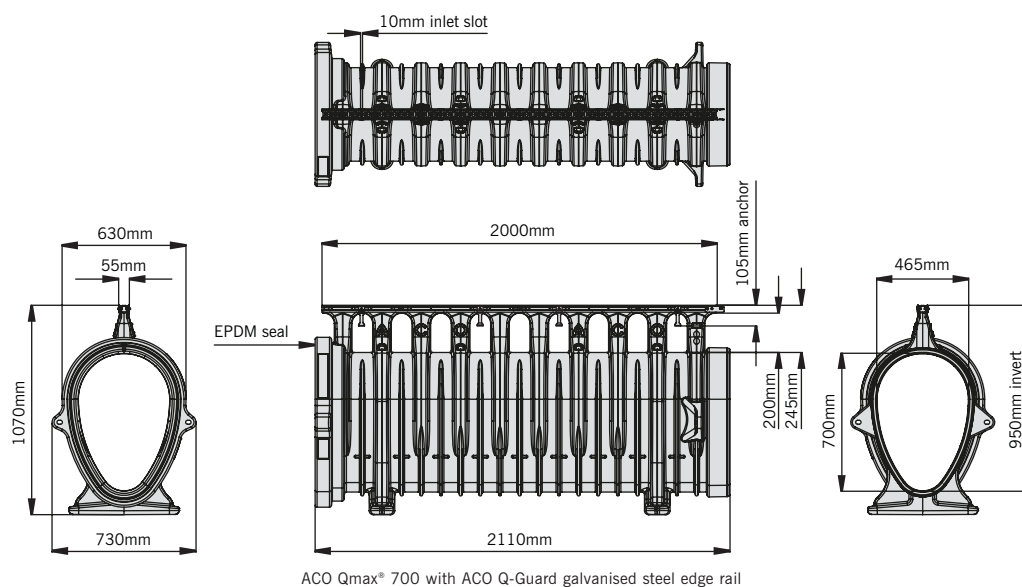
ACO Qmax® 700 with ACO Q-Flow galvanised steel edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32832	ACO Qmax® 700 channel assembly complete with ACO Q-Flow galvanised steel edge rail	2000	730	1070	26	41.9



ACO Qmax® 700 with ACO Q-Guard galvanised steel edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32833	ACO Qmax® 700 channel assembly complete with ACO Q-Guard galvanised steel edge rail	2000	730	1070	10	39.4



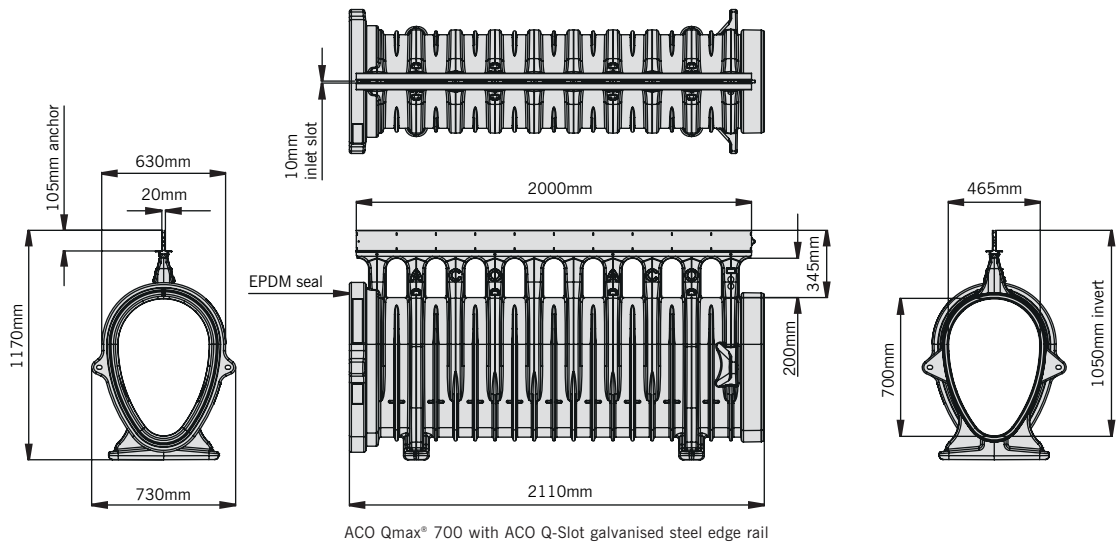
Note: For details regarding the access/silt chambers for use with this system please refer to page 53.

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

ACO Qmax® 700

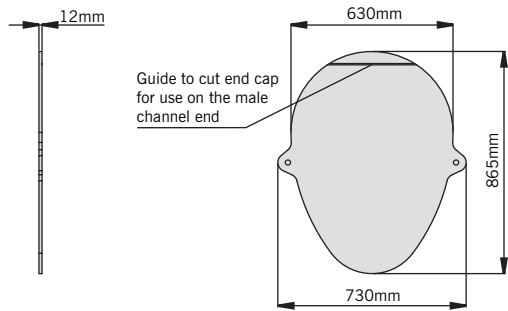
ACO Qmax® 700 with ACO Q-Slot galvanised steel edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32834	ACO Qmax® 700 channel assembly complete with ACO Q-Slot galvanised steel edge rail	2000	730	1170	10	47.0



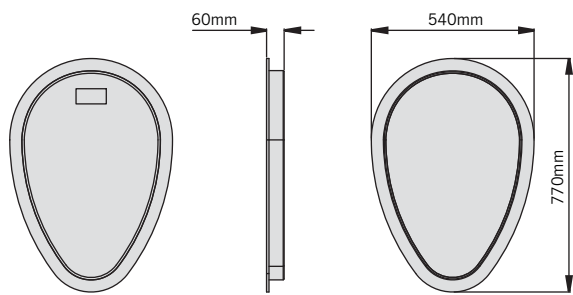
ACO Qmax® 700 closing end cap

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32835	ACO Qmax® 700 closing end cap	730	12	865	4.9



ACO Qmax® 700 blanking end cap

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32887	ACO Qmax® 700 blanking end cap	540	60	770	3.1



ACO Qmax® 700 blanking end cap has the following functions:

- ▶ Enables cut channels to be capped off if cut to length during installation
- ▶ Simple fitting

Installation instructions supplied

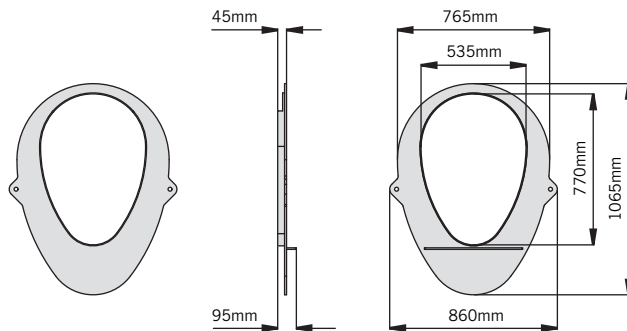
Note: For details regarding the access/silt chambers for use with this system please refer to page 53.

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

ACO Qmax® 700

ACO Qmax® 700 to 900 step connector

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32883	ACO Qmax® 700 to 900 step connector (M to F)	860	95	1065	3.7



ACO Qmax® 700 to 900 step connector

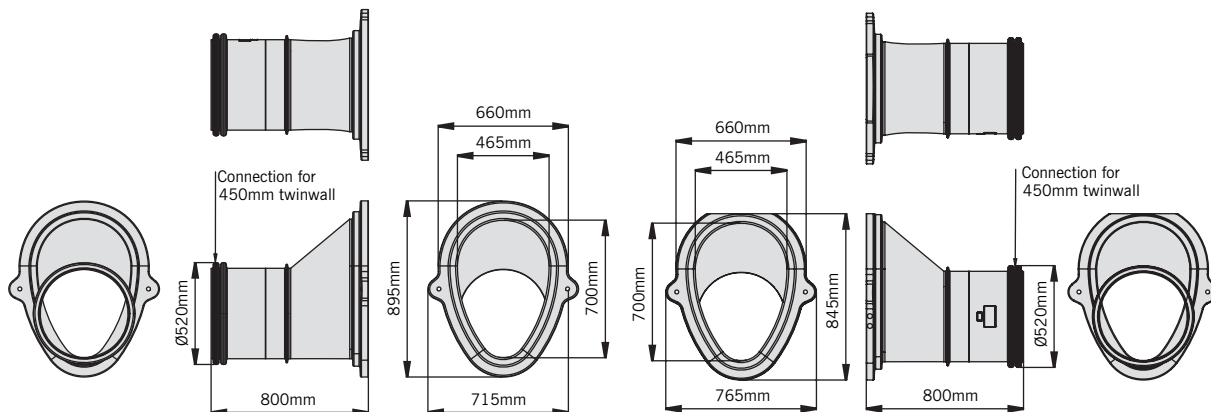
ACO Qmax® 700 to 900 step connector has the following functions:

- ▶ Enables step fall installations of ACO Qmax® 700 and ACO Qmax® 900 channels
- ▶ For use between ACO Qmax® 700 male and ACO Qmax® 900 female channel connections
- ▶ Simple fitting

Installation instructions supplied

ACO Qmax® 700 chamber connectors

Product code	Description	Weight (kg)
32836	ACO Qmax® 700 chamber connector assembly (pair)	15.8



ACO Qmax® 700 female end chamber connector

ACO Qmax® 700 male end chamber connector

ACO Qmax® ductile iron edge rail protector

Product code	Description	Length (m)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32854	ACO Qmax® ductile iron edge rail protector 15.25m roll	15.25	65	1.5	5.0

ACO Qmax® ductile iron edge rail protector has the following functions:

- ▶ Used to cover and protect rails from debris during installation
- ▶ Simple fitting
- ▶ Can be reused

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

ACO Qmax® 700 hydraulic performance tables

Hydraulic capacities

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

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

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

A (m²) 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 50mm/h (0.014 l/s/m²).

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 Qmax® 700 channels

Slope	0%			0.5%			1%		
Length to Outlet (m)	Q (l/s)	q (l/s/m)	A (m ²)	Q (l/s)	q (l/s/m)	A (m ²)	Q (l/s)	q (l/s/m)	A (m ²)
50	250.0	5.00	18000	345.0	6.90	24840	405.0	8.10	29160
100	230.0	2.30	16560	370.0	3.70	26640	450.0	4.50	32400
200	200.0	1.00	14400	406.9	2.03	29300	520.0	2.60	37440
300	183.3	0.61	13200	438.9	1.46	31600	550.0	1.83	39600
400	170.8	0.43	12300	458.3	1.15	33000	559.7	1.40	40300
500	160.0	0.32	11520	468.1	0.94	33700	565.3	1.13	40700
600	148.5	0.25	10690	473.6	0.79	34100	570.8	0.95	41100
690	140.4	0.20	10110	477.8	0.69	34400	575.0	0.83	41400
800	136.0	0.17	9792	477.8	0.60	34400	577.8	0.72	41600
900	129.3	0.14	9310	477.8	0.53	34400	577.8	0.64	41600
1000	125.0	0.13	9000	477.8	0.48	34400	577.8	0.58	41600

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.

Designing a drainage system

An example design method is provided on page 56 to help determine your drainage requirements.

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

ACO Qmax® 900



ACO Qmax® 900

ACO Qmax® 900



900	Unit size
	Hydraulic capacity
31700m ² *	Catchment area
0.4135m ³ /m	Attenuation capacity
	Access/silt chambers
	Q-Slot cover and frame

The ACO Qmax® 900 channel is manufactured from PE which is lightweight, chemically resistant and extremely robust. Its ovoid High-Flow bore, sealed push fit channel connections and unique patented inlet design ensure efficient drainage even at low hydraulic flows and promote self cleansing. Installation rates are maximised the product is fully integrated within the pavement detail providing long term dependable performance.

The increased hydraulic capacity of the ACO Qmax® 900 channel makes it ideal for larger catchments and can eliminate the need for additional carrier drains and pipework.

ACO Qmax® 900 channels are available with the following components:

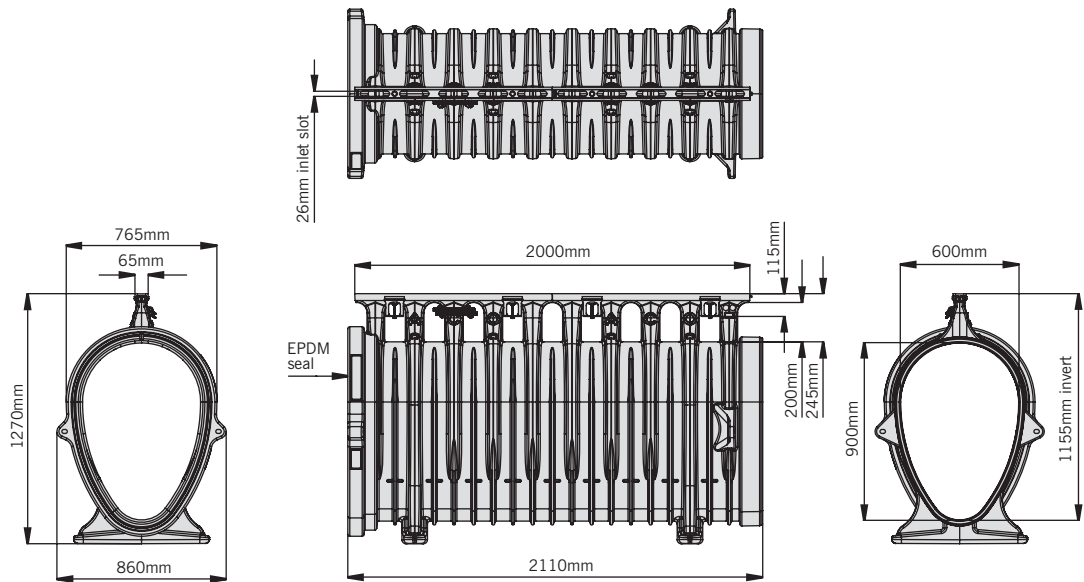
- Outlet, closing and blanking end caps
- Access and silt chambers
- Installation edge rail protectors
- Q-Brake Vortex flow controls

*Example run based on 100m length laid level at 50mm/hr rainfall

ACO Qmax® 900

ACO Qmax® 900 with ACO Q-Flow ductile iron edge rail

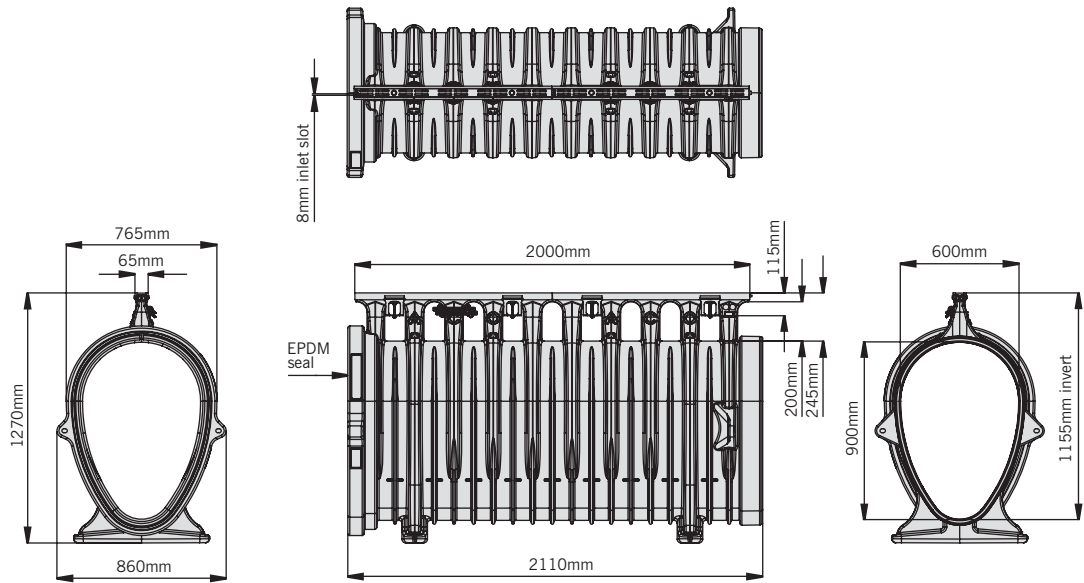
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32840	ACO Qmax® 900 channel assembly complete with ACO Q-Flow ductile iron edge rail	2000	860	1270	26	65.3



ACO Qmax® 900 with ACO Q-Flow ductile iron edge rail

ACO Qmax® 900 with ACO Q-Guard ductile iron edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32841	ACO Qmax® 900 channel assembly complete with ACO Q-Guard ductile iron edge rail	2000	860	1270	2 x 8	66.3



ACO Qmax® 900 with ACO Q-Guard ductile iron edge rail

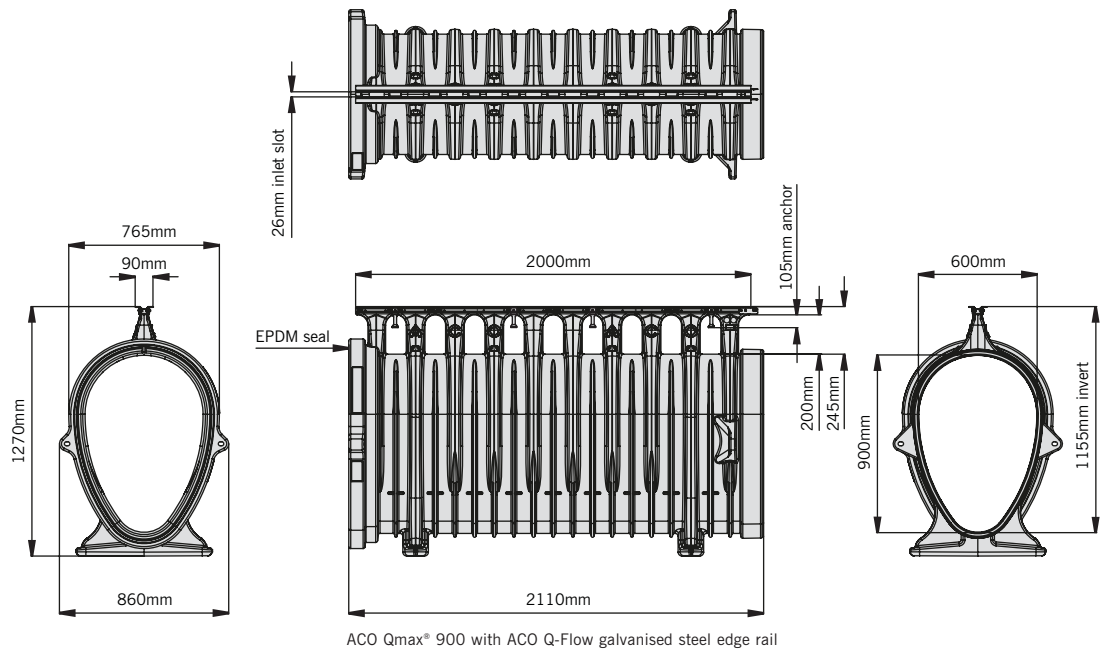
Note: For details regarding the access/silt chambers for use with this system please refer to page 53.

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

ACO Qmax® 900

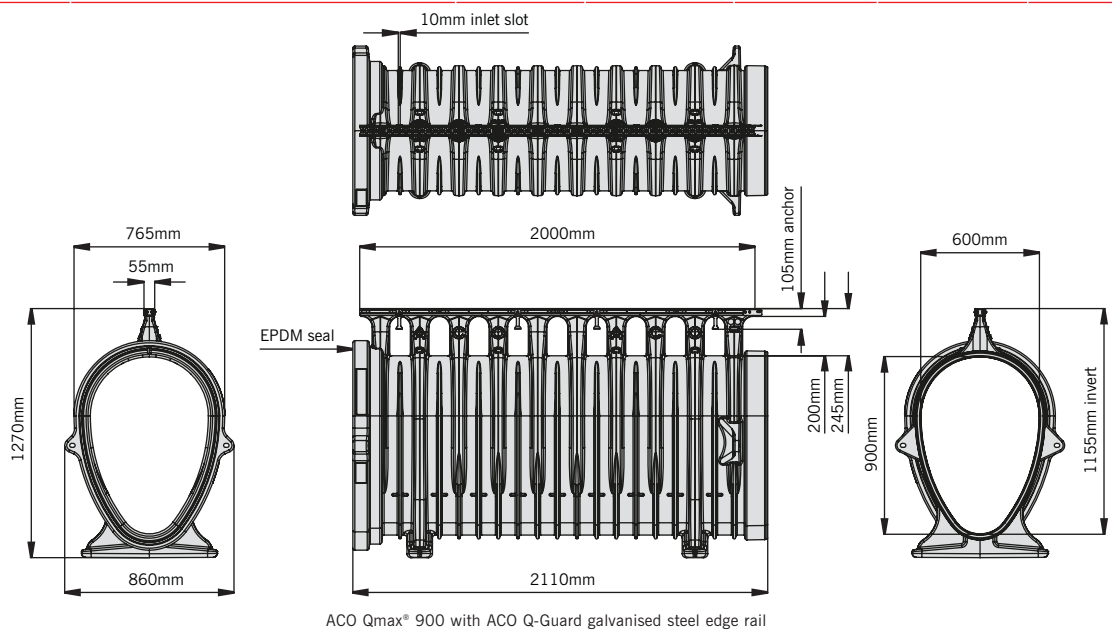
ACO Qmax® 900 with ACO Q-Flow galvanised steel edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32842	ACO Qmax® 900 channel assembly complete with ACO Q-Flow galvanised steel edge rail	2000	860	1270	26	57.2



ACO Qmax® 900 with ACO Q-Guard galvanised steel edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32843	ACO Qmax® 900 channel assembly complete with ACO Q-Guard galvanised steel edge rail	2000	860	1270	10	54.7



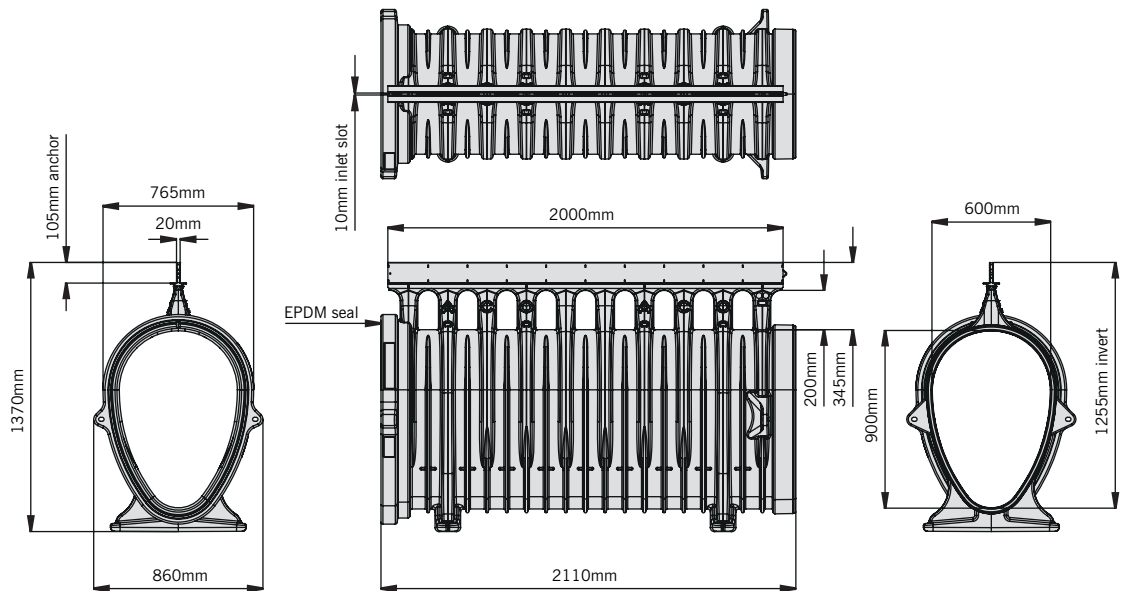
Note: For details regarding the access/silt chambers for use with this system please refer to page 53.

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

ACO Qmax® 900

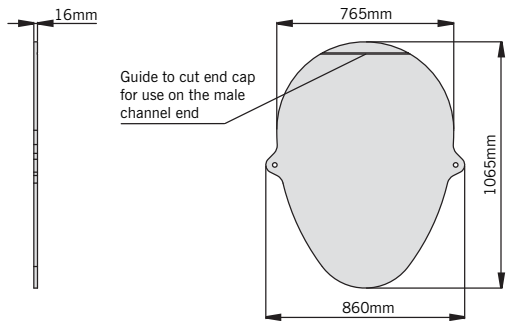
ACO Qmax® 900 with ACO Q-Slot galvanised steel edge rail

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width (mm)	Weight (kg)
32844	ACO Qmax® 900 channel assembly complete with ACO Q-Slot galvanised steel edge rail	2000	860	1370	10	62.3



ACO Qmax® 900 with ACO Q-Slot galvanised steel edge rail

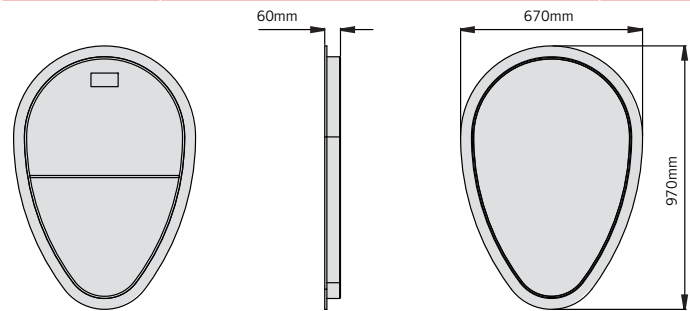
Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32845	ACO Qmax® 900 closing end cap	860	16	1065	9.8



ACO Qmax® 900 closing end cap

ACO Qmax® 900 blanking end cap

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32888	ACO Qmax® 900 blanking end cap	670	60	970	4.9



ACO Qmax® 900 blanking end cap

ACO Qmax® 900 blanking end cap has the following functions:

- ▶ Enables cut channels to be capped off if cut to length during installation
- ▶ Simple fitting

Installation instructions supplied

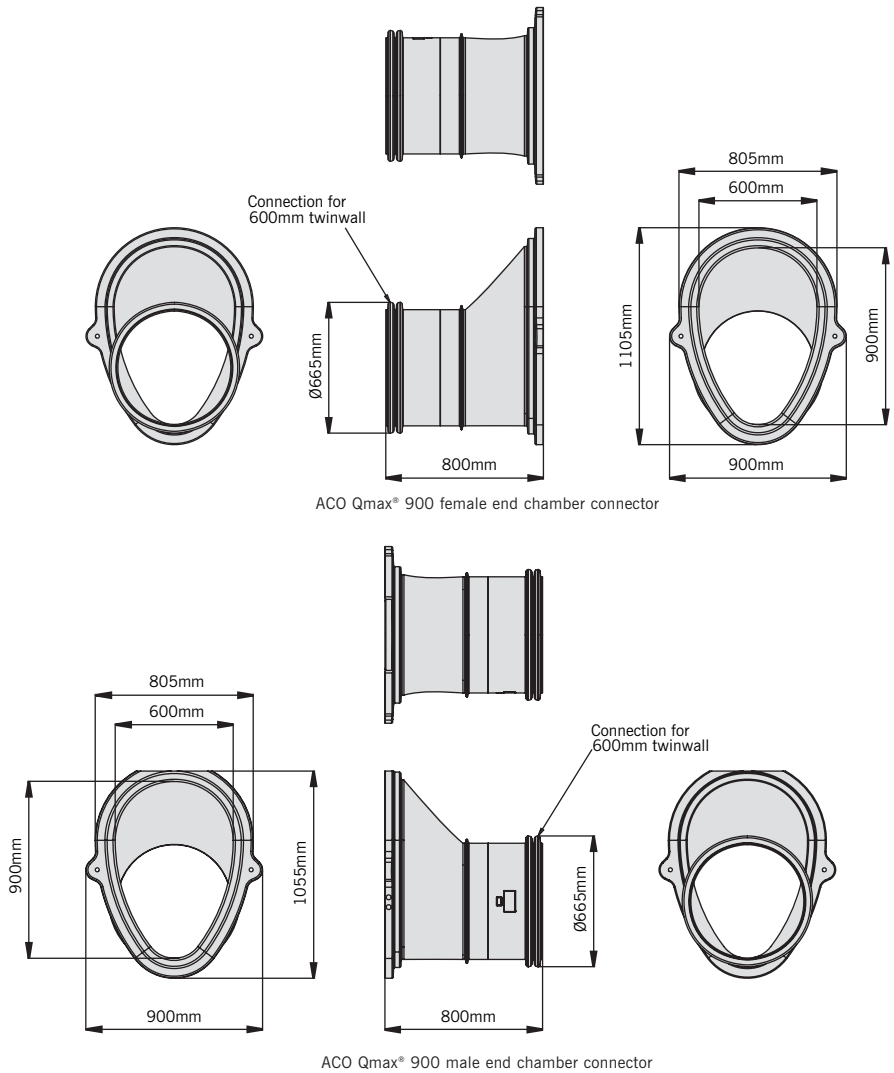
Note: For details regarding the access/silt chambers for use with this system please refer to page 53.

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

ACO Qmax® 900

ACO Qmax® 900 chamber connectors

Product code	Description	Weight (kg)
32846	ACO Qmax® 900 chamber connector assembly (pair)	25.1



ACO Qmax® ductile iron edge rail protector

Product code	Description	Length (m)	Width overall (mm)	Depth overall (mm)	Weight (kg)
32854	ACO Qmax® ductile iron edge rail protector 15.25m roll	15.25	65	1.5	5.0

ACO Qmax® ductile iron edge rail protector has the following functions:

- ▶ Used to cover and protect rails from debris during installation
- ▶ Simple fitting
- ▶ Can be reused

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

ACO Qmax® 900 hydraulic performance tables

Hydraulic capacities

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

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

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

A (m²) 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 50mm/h (0.014 l/s/m²).

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 Qmax® 900 channels

Slope	0%			0.5%			1%		
Length to Outlet (m)	Q (l/s)	q (l/s/m)	A (m ²)	Q (l/s)	q (l/s/m)	A (m ²)	Q (l/s)	q (l/s/m)	A (m ²)
50	466.5	9.33	33588	620.0	12.40	44640	730.0	14.60	52560
100	440.0	4.40	31680	675.0	6.75	48600	835.0	8.35	60120
200	400.0	2.00	28800	748.0	3.74	53856	950.0	4.75	68400
300	370.5	1.24	26676	786.0	2.62	56592	1005.0	3.35	72360
400	343.2	0.86	24710	808.0	2.02	58176	1027.8	2.57	74000
500	322.5	0.65	23220	825.0	1.65	59400	1045.8	2.09	75300
600	309.0	0.52	22248	834.0	1.39	60048	1055.6	1.76	76000
700	296.8	0.42	21370	841.8	1.20	60606	1064.0	1.52	76608
800	284.0	0.36	20448	852.0	1.07	61344	1075.2	1.34	77414
900	274.5	0.31	19764	857.7	0.95	61754	1080.0	1.20	77760
1000	265.0	0.27	19080	863.0	0.86	62136	1086.0	1.09	78192

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.

Designing a drainage system

An example design method is provided on page 56 to help determine your drainage requirements.

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

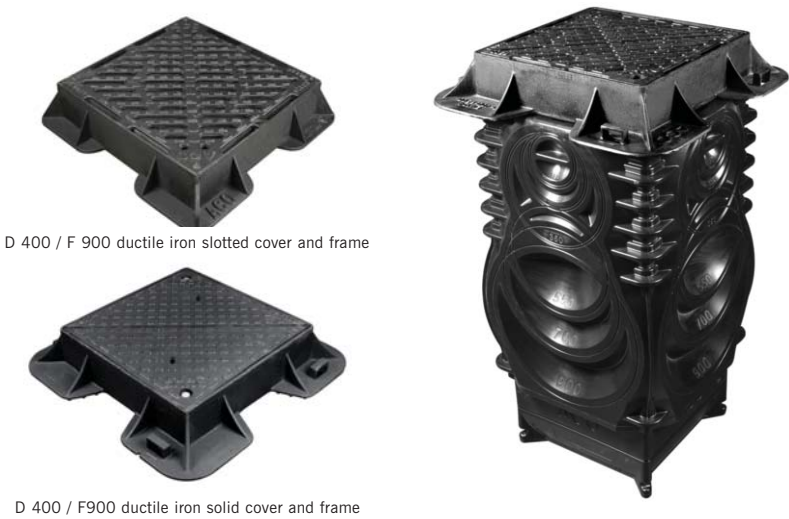
ACO Qmax® 550, 700 and 900 access and silt chamber

The ACO Qmax® 550, 700 & 900 access and silt chamber provides a compact and economical method of gaining access to the channel system for maintenance and cleaning, or silt management.

The chamber is specifically designed for use with ACO Qmax® 550, 700 and 900 channels and allow 4-way channel connections to be made for simple directional changes and optimised scheme designs.

ACO Qmax® 225 and 350 channel connections are also provided where large silt capacities are required or if all channel sizes are to be connected to the access chamber.

The ACO Qmax® access and silt chamber is manufactured from PE which is lightweight, tough and chemically resistant.



Cover and frame options

The chambers come complete with either a ductile iron slotted or solid double triangular cover and frame. Both options are available in Load Class D 400 or F 900. As standard all F 900 ductile iron slotted or solid covers are lockable for added product and site security.

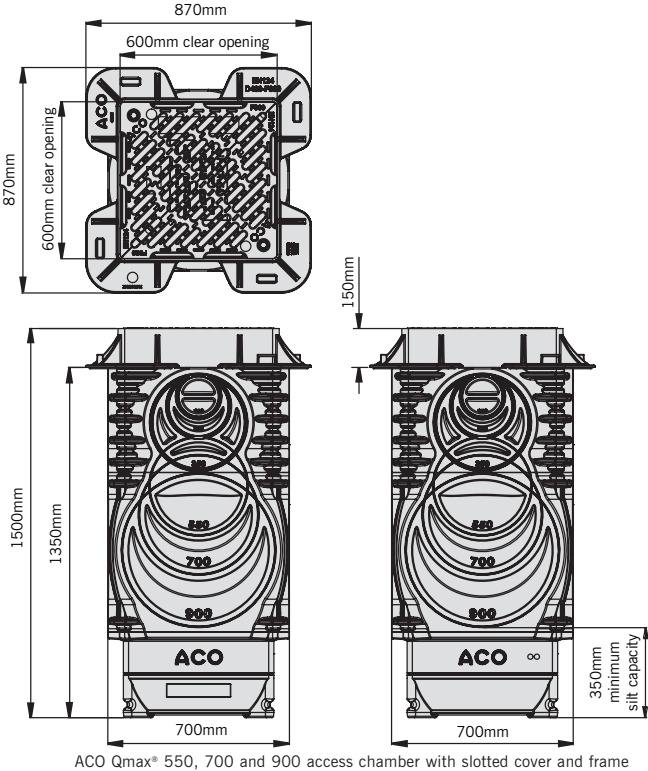
Where access and silt chambers are to be used in conjunction with ACO Qmax® Q-slot channels, a recessed cover and frame supplied by others can be used in conjunction with the ACO Qmax® 550, 700 and 900 access and silt chamber bodies. For further details of the chambers supplied without covers and frames,

please contact the ACO Water Management Customer Support Team on 01462 816666.

Materials used in the construction of ACO Qmax® chambers contain high levels of recycled materials and are themselves recyclable at the end of their life.

ACO Qmax® access chamber assemblies

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
44314	Access chamber with D 400 slotted cover and frame	870	870	1500	148
44315	Access chamber with D 400 solid cover and frame	870	870	1500	147
44316	Access chamber with F 900 slotted cover and frame	870	870	1500	181
44317	Access chamber with F 900 solid cover and frame	870	870	1500	175



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

Controlling stormwater discharge

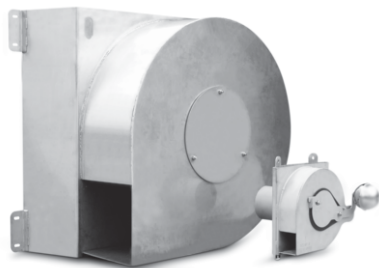
If a controlled rate discharge is required, ACO Qmax® can be used in conjunction with the ACO Q-Brake flow control unit to regulate stormwater flows.

ACO Q-Brake provides superior hydraulic performance in comparison to traditional flow control systems and permits more flow at lower heads, reducing storage volume requirements and lowering cost.

Compared with more conventional methods e.g. orifice plates or sized pipework, ACO Q-Brake is less prone to blockage and permits higher flow at a lower head of water, as a vortex flow control allows an outlet orifice 4-6 times larger in cross-sectional area to be used.

The installation opposite simulates how the ACO Qmax® 900 channel system is used to provide surface water drainage, whilst the ACO Q-Brake is used to regulate the rate of discharge from the development into the watercourse or sewer network.

The benefits of using this stormwater control system are best demonstrated in the example shown on the opposite page. The example demonstrates that upstream storage requirements can be reduced by 10% when an ACO Q-Brake Vortex Flow Control is used instead of a traditional flow control system.



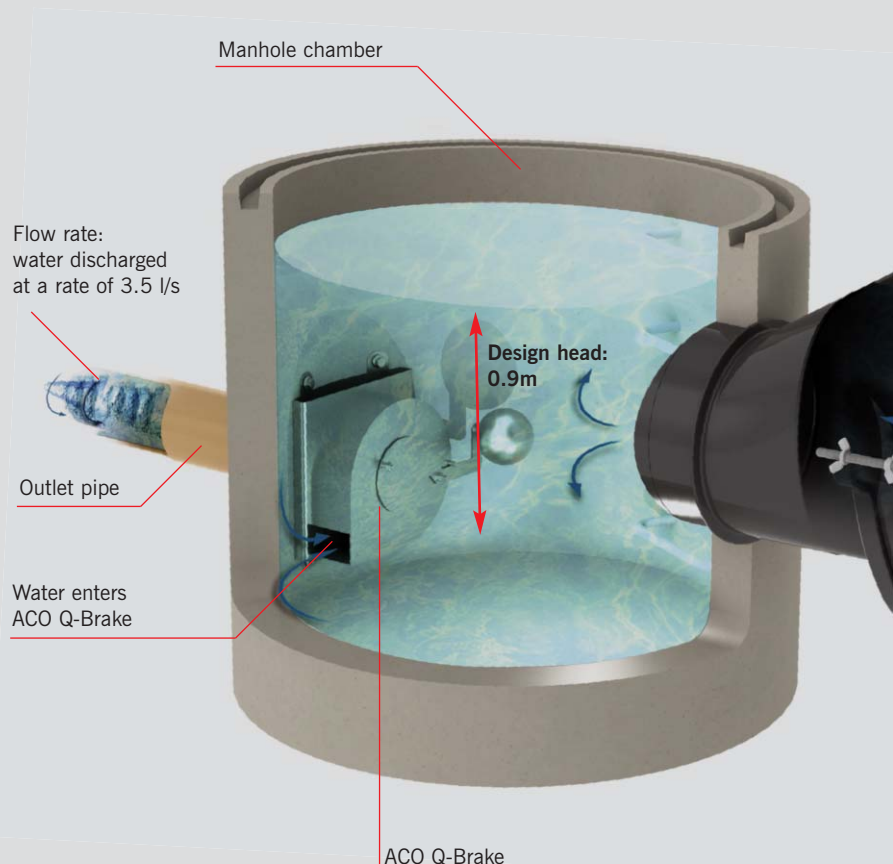
ACO Q-Brake specification and design process

Manufactured from grade 304 stainless steel, each ACO Q-Brake is individually configured to suit specific performance criteria. Our engineers will use industry standard drainage software and hydraulic design calculations to ensure the system is correctly sized for any project requirement.

ACO Qmax® channel attenuation storage with a Q-Brake flow control

Example:

There is a project in Bedford, England with a catchment area of 1200m². The project has design criteria of a 1 in 30 year storm and the runoff from the site must not exceed 3.5l/s at a design head of 0.9m (the height of the ACO Qmax® 900 channel).



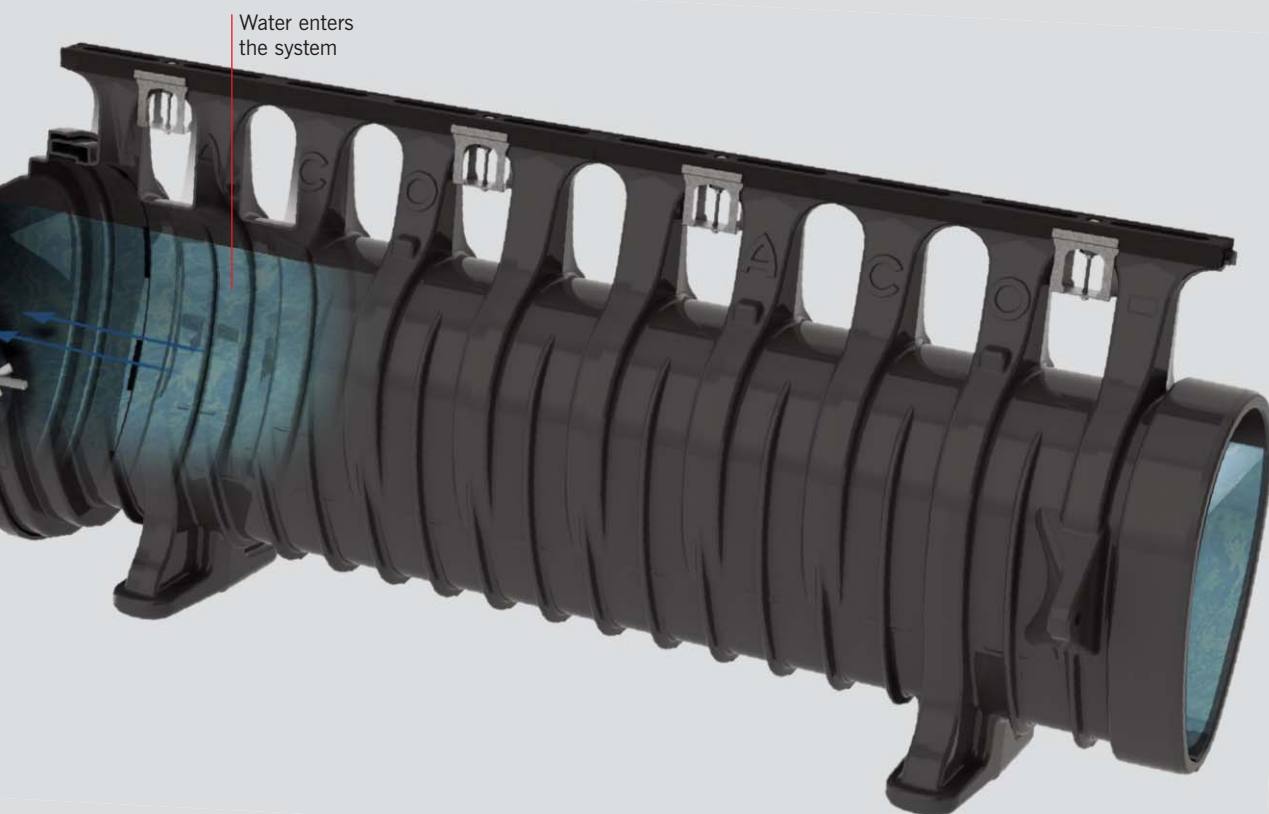
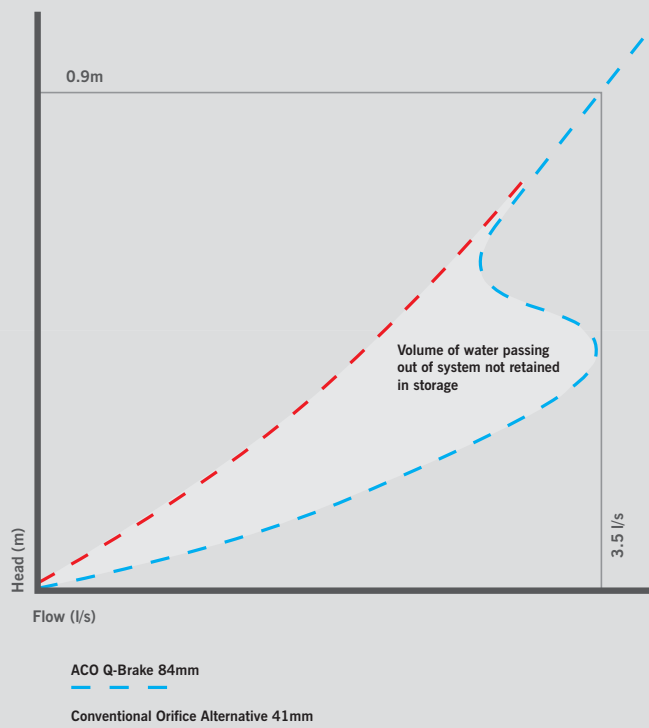
Results:

Using MicroDrainage® software, ACO has compared the upstream storage requirements using ACO Q-Brake and a traditional orifice plate. The results are summarised below:

- ▶ ACO Q-Brake required Ø84mm.
Upstream attenuation requirement met by 50m ACO Qmax® 900.
- ▶ Orifice plate size required Ø41mm.
Upstream attenuation requires 55m of ACO Qmax® 900.

ACO Q-Brake reduces the requirement for attenuation whilst having an orifice over four times the area of the traditional orifice plate and making ACO Q-Brake more efficient and far less prone to blockage.

Discharge characteristics



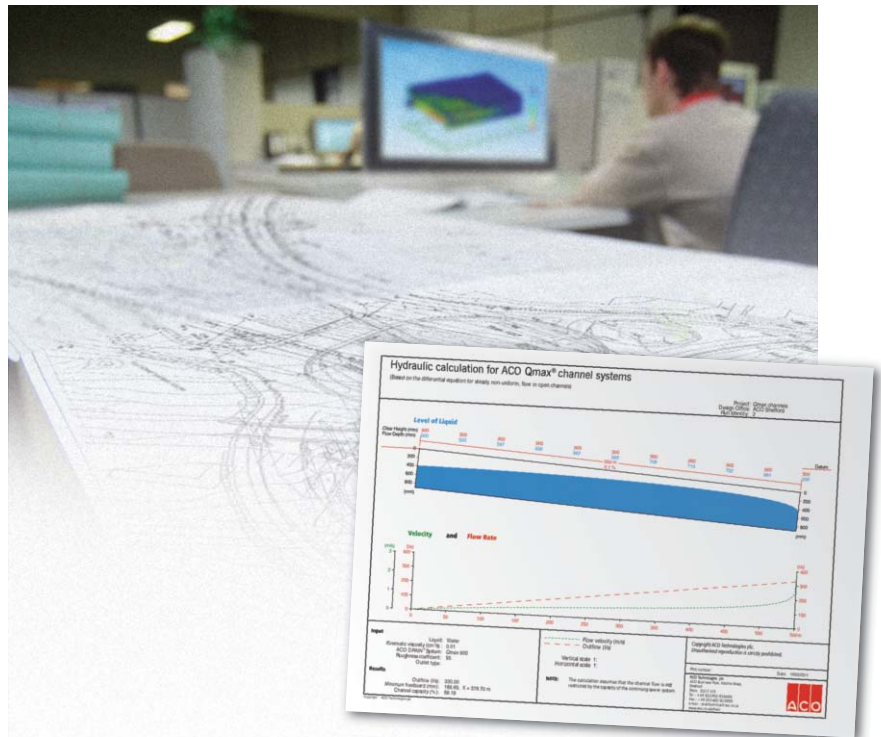
Designing an ACO Qmax® drainage system

The hydraulic capacity of channels accepting flow 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. ACO Design enables users to develop an optimised design of stepped sizes of channels, increasing in size down the run of the channel. For more information visit www.aco.co.uk.

Designing a drainage system

Design of a run of channel drainage requires data on the total drainage catchment area (taken from drawings) and the design rainfall intensity (determined with reference to guidance in BS EN 752). Typical design rainfall intensities are 50mm/h (0.014 l/s.m²) for areas where some ponding could be tolerated during and for a few minutes after heavy rain, or approximately 75mm/h (0.021 l/s.m²) where ponding cannot normally be tolerated. For large areas, BS EN 752 should be consulted to determine an appropriate design rainfall.

Where the attenuation volume of the large capacity channels is to be analysed, the storage requirements will need to be determined for a range of different storms. ACO can provide channel data for use in proprietary software, such as MicroDrainage WinDes. Please contact ACO Water Management Design Services Team.



It should be noted that other 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 totally inappropriate for channel drainage design. They will not work at all with level channels and will give grossly inaccurate results at shallow gradients.

ACO Water Management Design Services Team

ACO has embraced the concept of 'value engineering' – 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 Qmax®, it is often possible to remove the need for any conventional underground drainage.

For detailed designs using the ACO Hydro 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.

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 the drainage requirements.

The columns of drainage catchment area (A m²) 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 l/s) and maximum lateral inflow (q l/s/m) can be used at any rainfall intensity.

ACO Water Management Design Services Team

Tel: 01462 816666
Email: technical@aco.co.uk



The team is equipped with a new in-house design programme - ACO Hydraulic Design software – this unique, highly sophisticated software is built to enable the efficient and accurate hydraulic design of surface water management schemes using channels as the means of conveyance. ACO Hydraulic Design is also available for you to utilise. Visit www.aco.co.uk to find out more.



Design example

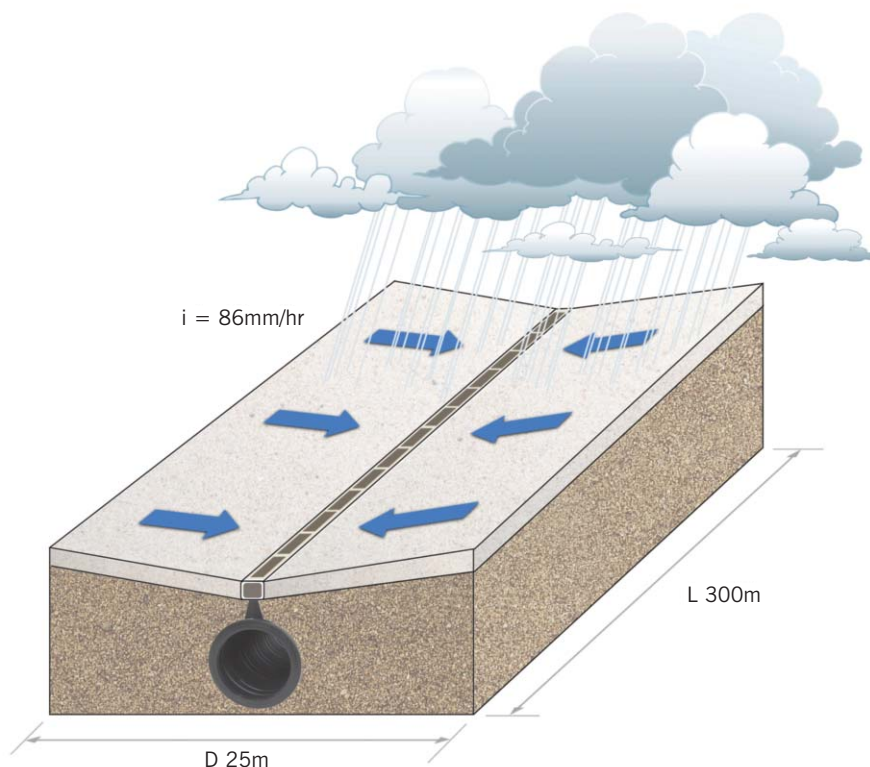
For a design of ACO Qmax®, assume the following figures:

D = 25m (depth of catchment area)

L = 300m (length of run = length of catchment)

i = 86mm/hr (design rainfall intensity)
Ground slope = 0%

The determination of the capacity of the proposed ACO Qmax® channel can be determined from the tables in this brochure in any one of three ways. Using the catchment area is particularly easy when the UK default rainfall intensity of 50mm/h is used for design (but can be used at other rainfall intensities as in the example below). Using the total flowrate Q or the lateral inflow q the capacity can be read straight off the tables at any rainfall intensity.



GUIDANCE NOTES

1. Determine the area

$$\text{Area} = L \times D = 300 \times 25 = 7,500\text{m}^2.$$

The tables in the respective product chapters give the maximum area that can be drained. However the tables use the standard UK default rainfall intensity of 50mm/hr, and this design requires a higher design rainfall of 86mm/hr. So in order to use the tables to determine the maximum area that can be drained, increase the effective area to, in this case, $7500 \times 86/50 = 12,900\text{m}^2$.

From the tables for ACO Qmax® 700 on page 40, for a slope of 0% it can be seen that a 300m length can drain the required area (it could actually drain $13,200\text{m}^2$ at 50mm/hr or $7,675\text{m}^2$ at 86 mm/h).

2. Determine the total flow in the channel (Q)

The total flow $Q = \text{area} \times \text{rainfall intensity}$ (and where rainfall intensity is in mm/h, divide by 3600 to adjust the units from hours to seconds).

$$Q = 300 \times 25 \times 86 / 3600 = 179 \text{ l/s}$$

Again we see from the table that the 300m run of ACO Qmax® 700 can carry the flow (max flow rate from the table is 183 l/s).

3. Determine the lateral inflow rate (q)

Dividing the total flow by the total channel length gives the rate of lateral inflow into the channel, in l/s per metre run of channel.

$$q = Q / L$$

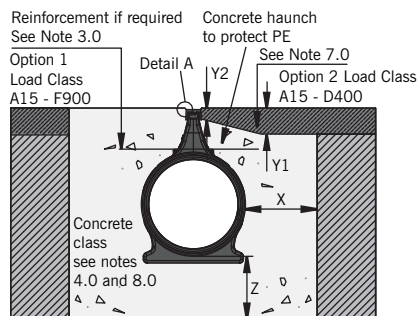
$$q = 179 / 300 = 0.597 \text{ l/s/m}$$

We see from the table that the 300m run of ACO Qmax® 700 can carry the flow (max lateral flow rate from the table is 0.61 l/s).

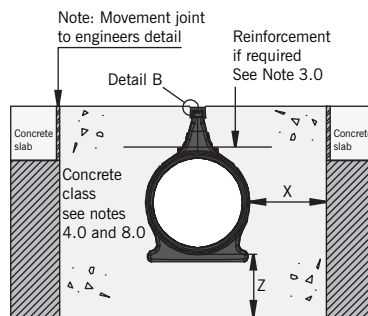
Channel installation detail

ACO QMAX® 150, 225 AND 350 CHANNEL UNITS

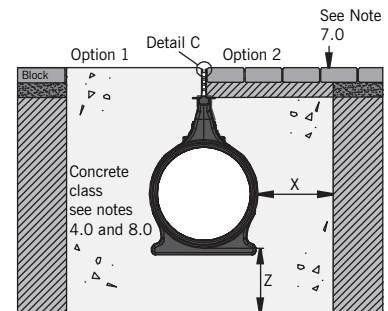
Asphalt pavement Option 1 & 2



Concrete pavement



Block pavement Option 1 & 2



General note. These installation details are based on UK site methods and installation practices only. The suitability of all other local or national site and installation practices must be checked. Please seek engineering advice.

1.0 Ground conditions

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

2.0 Surface protection

The channels must not be trafficked until completion of the installation and the pavement surface. Thereafter the channel should be protected and kept free from mud and stones. During sitework ensure that the plastic protective strip (supplied with the galvanised steel edge rails) or the ductile iron edge rail protector (supplied separately) is not damaged or displaced, in order to prevent debris entering the channel during construction.

3.0 Reinforcement

The reinforcement required in the concrete surround varies with the installation group (load class) and channel size. For a Load Class D 400 application it is likely to be sufficient to continue the slab reinforcement (if any) through the Qmax® arch detail under the slot.

For Load Class F 900 it may be necessary to reinforce over, under and to the sides of the unit (as indicated). Engineering advice should be sought.

4.0 Concrete surround

The minimum class of concrete is given in table 8.0 depending on channel size and Load Class, subject to the site engineer's specification. Ensure that the channels do not float when pouring the concrete. To prevent flotation or distortion of the ACO Qmax® 550, 700 & 900 channels, pour concrete in several lifts, e.g. 1 to the line on the side of the channel, 2 to the crown of the channel and 3 to the finished levels.

Concrete to lifts 1 and 2 to be 50mm maximum slump (consistence class S1).

5.0 Joints

The detailing of joints is to be determined by the engineer in conjunction with the detailing of the pavement. A longitudinal expansion joint is typically formed down each side of the concrete surround as indicated. A transverse joint is typically formed at each channel section collar (e.g. by 100mm deep saw cut or 75mm deep plastic joint former).

6.0 Watertightness

Where ACO Qmax® channels are to be installed with watertight joints, the seal between channel units must be checked for cleanliness and then smeared with lubricant jelly such as proprietary pipe joining lubricant.

Guidance on the preparation should be sought from the lubricant manufacturer. ACO Qmax® channels are tested to confirm compliance with the watertightness requirements of BS EN 1433 when filled with water to the top of the channel bore (below the inlet arches). Installation must be in accordance with ACO's recommendations and the recommendations of the lubricant manufacturer. It is envisaged that the channel joints would not be subject to movement, but any movement of the joint might compromise watertightness.

7.0 Pavement

The combined depth of the asphalt pavement must not exceed the Y1 and Y2 dimensions given in table 8.0. Ensure the edge rail arches are well embedded into the concrete.

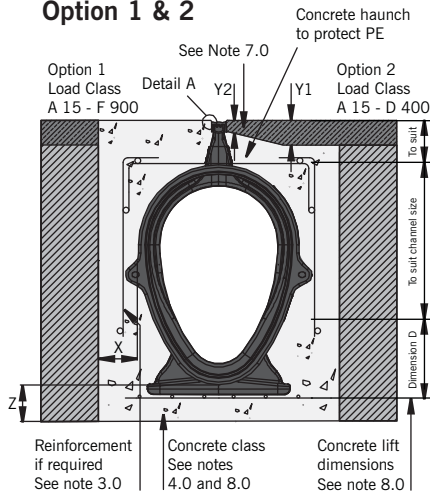
When laying blocks with the ACO Qmax® with Q-Slot edge; the first block must be bedded in epoxy mortar to ensure the slot is supported and the block is restrained from movement.



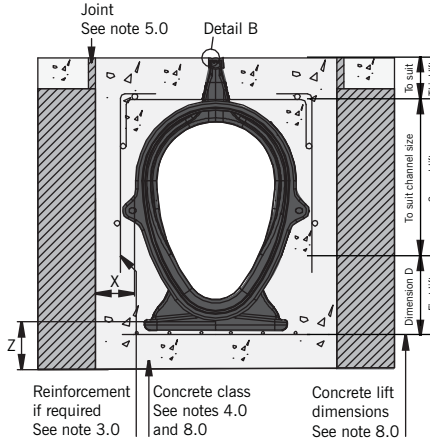
An electronic version of the ACO Qmax® installation detail is available to download from the ACO website. Visit www.aco.co.uk.

ACO QMAX® 550, 700 AND 900 CHANNEL UNITS

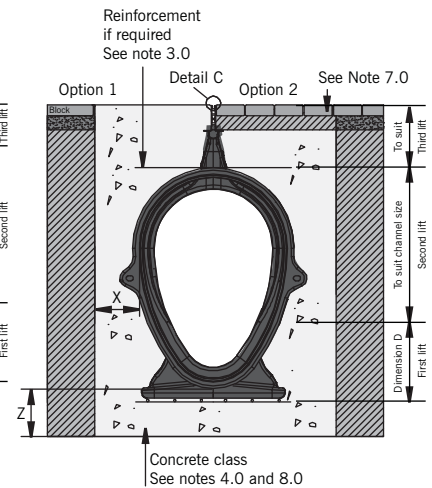
Asphalt pavement Option 1 & 2



Concrete pavement



Block paving



8.0 Load Class concrete requirements

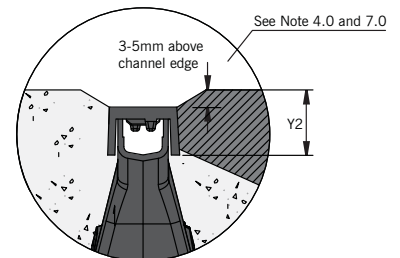
Qmax® 150

Load Class:	C 250	D 400	E 600	F 900
Concrete class:	C20/25	C20/25	C20/25	C20/25
X	100	100	150	200
Z	100	100	150	200
Y1	110 max	110 max	N/A	N/A
Y2	35 max	35 max	N/A	N/A
Reinforcement	No	No	No	Yes

Qmax® 550

Load Class:	C 250	D 400	E 600	F 900
Concrete class:	C20/25	C20/25	C20/25	C32/40 or EU 30/37
X	150	150	200	200
Z	150	150	200	200
Y1	110 max	110 max	N/A	N/A
Y2	35 max	35 max	N/A	N/A
Reinforcement	No	No	No	Yes
Dimension D	265	265	265	265

Detail A



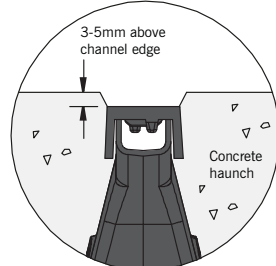
Qmax® 225

Load Class:	C 250	D 400	E 600	F 900
Concrete class:	C20/25	C20/25	C32/40 or EU 30/37	C32/40 or EU 30/37
X	150	150	150	200
Z	150	150	150	200
Y1	110 max	110 max	N/A	N/A
Y2	35 max	35 max	N/A	N/A
Reinforcement	No	No	No	Yes

Qmax® 700

Load Class:	C 250	D 400	E 600	F 900
Concrete class:	C20/25	C20/25	C32/40 or EU 30/37	C32/40 or EU 30/37
X	150	150	200	200
Z	150	150	200	200
Y1	110 max	110 max	N/A	N/A
Y2	35 max	35 max	N/A	N/A
Reinforcement	No	No	Yes	Yes
Dimension D	290	290	290	290

Detail B



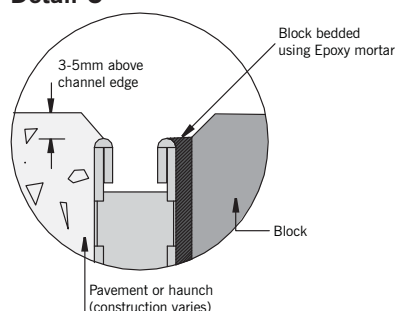
Qmax® 350

Load Class:	C 250	D 400	E 600	F 900
Concrete class:	C20/25	C20/25	C32/40 or EU 30/37	C32/40 or EU 30/37
X	150	150	150	200
Z	150	150	150	200
Y1	110 max	110 max	N/A	N/A
Y2	35 max	35 max	N/A	N/A
Reinforcement	No	No	No	Yes

Qmax® 900

Load Class:	C 250	D 400	E 600	F 900
Concrete class:	C20/25	C32/40 or EU 30/37	C32/40 or EU 30/37	C32/40 or EU 30/37
X	200	200	200	200
Z	200	200	200	200
Y1	110 max	110 max	N/A	N/A
Y2	35 max	35 max	N/A	N/A
Reinforcement	No	Yes	Yes	Yes
Dimension D	315	315	315	315

Detail C



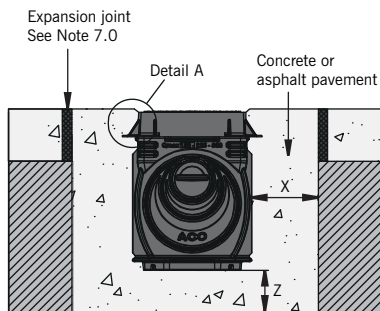
9.0 Cutting of channels

The 2000mm long channels may be cut to a shorter length of 400mm, 1000mm and 1400mm.

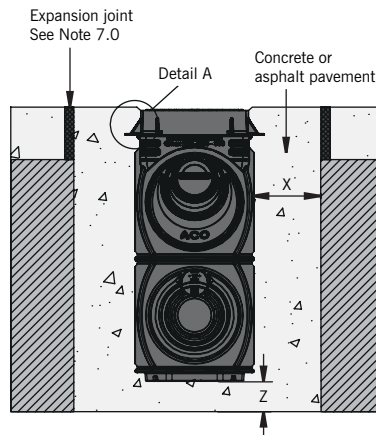
All dimensions are shown in mm.

Access chamber installation detail

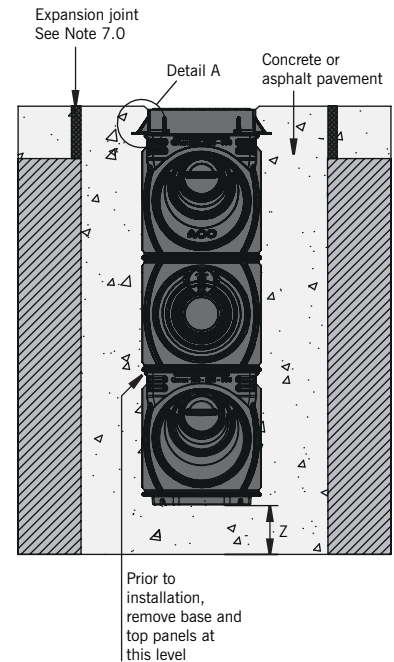
ACO Qmax® 150, 225 & 350 access chamber with slotted cover and frame



ACO Qmax® 150, 225 & 350 access, outlet/inlet chamber with slotted cover and frame



ACO Qmax® 150, 225 & 350 access, outlet/inlet and silt chamber with slotted cover and frame



1.0 Chamber preparation

Remove the appropriate ACO Qmax® access chamber circular connection panel(s) with padsaw or similar.

For the access, outlet/inlet, silt chamber, remove the base of the upper unit and top of the lower unit.

2.0 Excavation

Excavate including for the concrete bed and surround. Allowance must be made for the access chamber, cover and frame.

3.0 Concrete base

Backfill the ACO Qmax® access chamber with concrete, for class see table 8 on page 59, to fix the unit in place. Ensure the chamber does not float or move.

4.0 Channel connection

Connect the channels: For the ACO Qmax® 150, 225 and 350 female channel connections the seal must be removed to connect to the ACO Qmax® Access Chamber. Male channels can connect directly. For connection of ACO Qmax® 550, 700 and 900 channels to ACO Qmax® access chambers an access chamber connector must be used. The ACO Qmax® access chamber connector must be cut, and the pipe connection detail removed, to enable connection to the ACO Qmax® access chamber.

5.0 Concrete surround

Install and backfill access chamber and channels with concrete as per ACO installation detail. Remove ACO Qmax® access chamber top panel prior to installation of frame and cover.

The minimum class of concrete is given in table 8.0 on page 59 depending on channel size and load class required with the chamber, subject to the client engineer's specification.

6.0 Chamber design and reinforcement

The customer should ensure that the minimum dimensions shown are suitable for the existing ground conditions. The structural design/reinforcement of the concrete surround is to be determined by the client. Engineering advice may be necessary.

The reinforcement required in the chamber construction varies with the installation group (load class). Engineering advice should be sought.

7.0 Joints

The detailing of joints is to be determined by the engineer in conjunction with the detailing of the pavement. A longitudinal expansion joint is typically formed down each side of the chamber (as indicated). Where the pavement is asphalt or block paving (with no concrete slab), then expansion joints may not be necessary. Engineering advice should be sought.