



2in1

Kerb and
Drainage

A one-piece

drainage system

ACO DRAIN® KerbDrain Road



ACO DRAIN® KerbDrain Road

The success story of our 2in1 kerb channel system ACO KerbDrain continues. In addition to the linear drainage of urban roads, bridges and tunnels, we now also offer an attractive 2 in 1 one-piece drainage solution for use on motorways and trunk roads.

In addition to our products, we also offer our expertise and services to help you find a sensible and economical solution for your project. Our engineers provide support from the first design drawing through to commissioning and beyond.

ACO KerbDrain Road

Half battered
kerb road version



ACO KerbDrain Road

Splayed
kerb road version



Supplementary brochures

**ACO DRAIN®
Kerb Drain City**
Kerb and drainage: two
functions - one solution

**ACO DRAIN®
Kerb Drain Bridge**
for linear bridge drainage

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ACO. creating the future of drainage

The worldwide ACO Group. A strong family you can build on

The ACO Group is one of the global market leaders in the drainage technology sector. Climate change challenges us to come up with innovative solutions in response to new environmental influences. ACO adopts an integrated approach and focuses on professional drainage, efficient cleaning and the controlled drainage or reuse of water. The company's products comprise drainage channels and gullies, oil and grease separating systems, back flow systems and pumps as well as pressurised watertight basement and cellar windows and light shafts.

The family company, which is based in Rendsburg/Büdel-dorf, was founded on the grounds of the Carlshütte, the first industrial company in Schleswig-Holstein, in 1946. The ACO Group's innovation capability is the result of intensive research and development and expertise in the processing of polymer concrete, plastic, cast iron, stainless steel and reinforced concrete.

ACO Civil Engineering. Solutions for the Infrastructure of tomorrow

As a reliable partner of the specialist civil engineering construction materials trade, ACO offers solutions for professional surface water management and water protection. The company plays a large role in the planning and design of urban, infrastructural and industrial drainage. Whether for public clients, consultant engineers, landscape gardening architects, contractors and operators, within ACO provides not only innovative product solutions for civil engineering, road construction and landscape gardening. With comprehensive design tools and services, ACO can also assist with the design, construction and sustainable operation of modern drainage systems.

www.aco.com



5,000

employees in more than 46 countries (Europe, North America and South America, Asia, Australia, Africa)

900 Mio.

Euro Sales 2020

36

Production sites in 18 countries



Head Office of the ACO Group
in Rendsburg/Büdel-dorf



ACO Academy
for practical training

Owner
Hans-Julius and Iver Ahlmann (left)



Engineering aspects on road construction

Planning and management of motorways

The demands on the motorway network are constantly increasing. The increasing prevalence of heavy goods traffic, stricter safety regulations and the growing amount of heavy rainfall are constantly presenting planners and operators of trunk roads with new challenges.

As a long-standing and reliable partner in the field of infrastructure, ACO offers completely customised drainage solutions for federal traffic routes and engineering structures from a single source. Whether motorway, tunnel or bridge, whether point or line drainage, together we can find an economical solution.

Motorway drainage

Why use kerbs in federal road construction?

The general planning principles for the construction of motorways are laid down in national guidelines for the construction of motorways. The general rule here is that **open drainage pointing towards the shoulder** is generally desired.



There are often restrictions that do not allow open drainage across the shoulders:



Water conservation areas



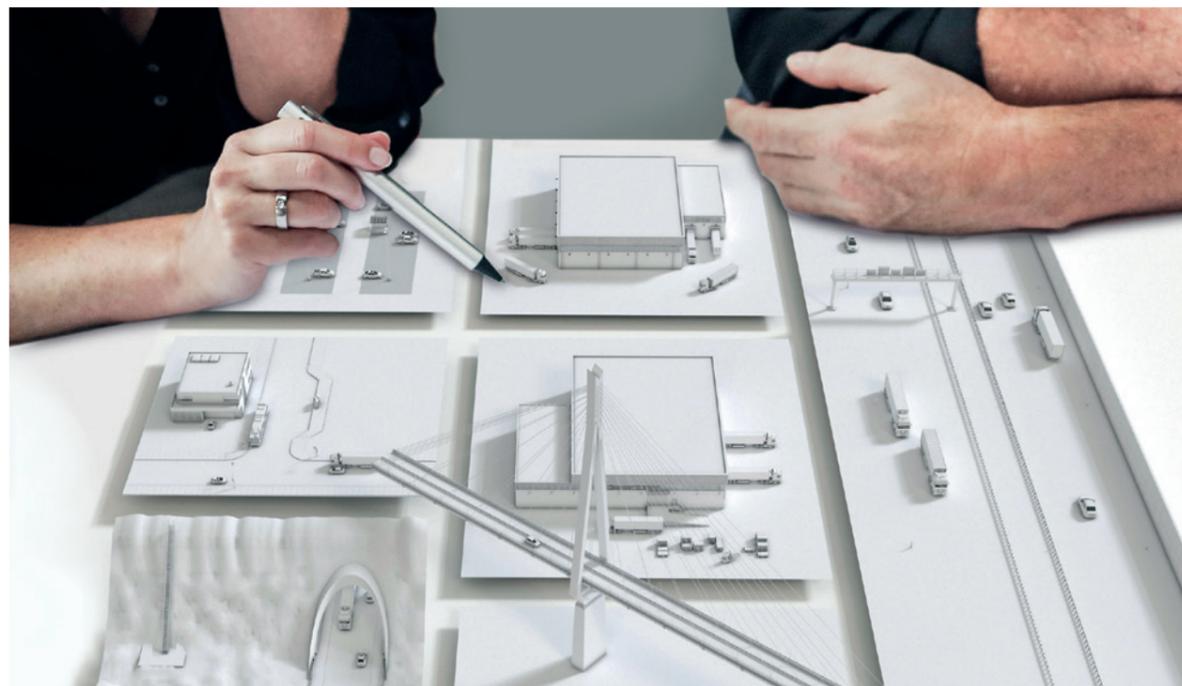
Confined spaces (e.g. noise barriers)



Soils not capable of infiltration



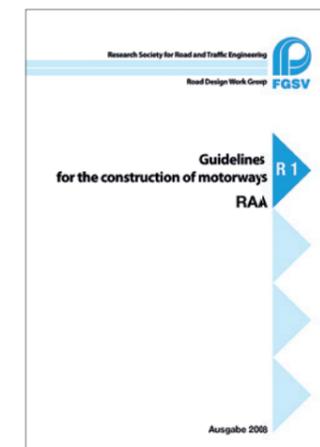
Drainage to the central reservation



Professional planning with ACO Civil Engineering

Regulations of the FGSV (The German Road and Transportation Research Association)

The rules and regulations can be obtained from www.fgsv-verlag.de

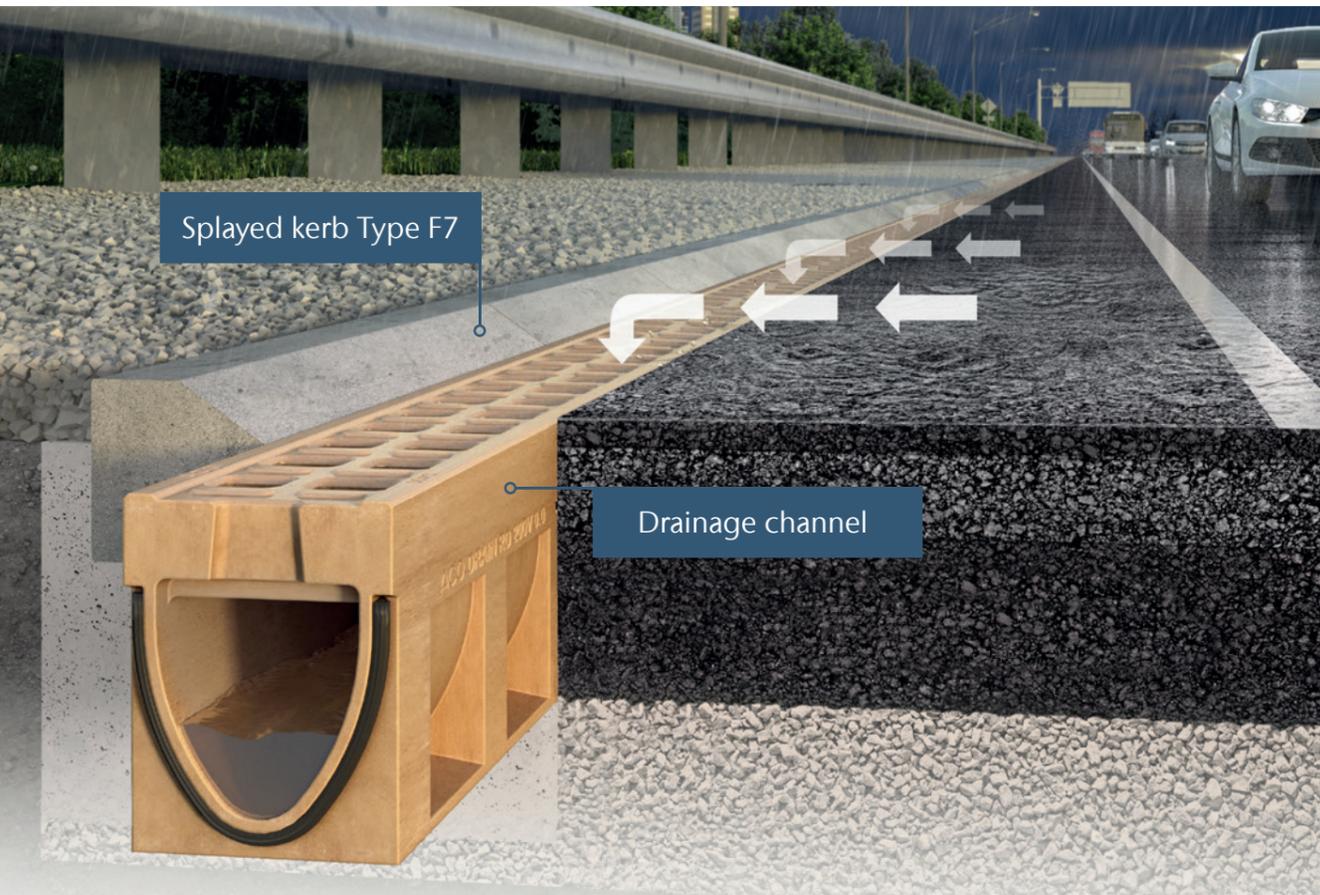


Previously: Drainage via channel + concrete kerbs

If open drainage is not possible, there must be a boundary at the side to drain off the rainwater. If possible, **splayed kerb** should be used for this.

The situation today

Kerb and drainage channel



The situation in the future

ACO KerbDrain Road kerb channel



8

A drainage channel with a separate concrete splayed kerb is often used in the aforementioned applications. As a rule, **two construction crews** (of 2 persons) have been used until now in order to ensure the most economical installation of a concrete kerb and the separate drainage channel. After preparing the building ground, team 1, as an example, places the channel element and team 2 then installs the required concrete kerb. The work is finished with a concrete haunch and a joint between the kerb and the channel (see also p. 15). In close cooperation with our customers, we have created a new product portfolio for federal road construction.



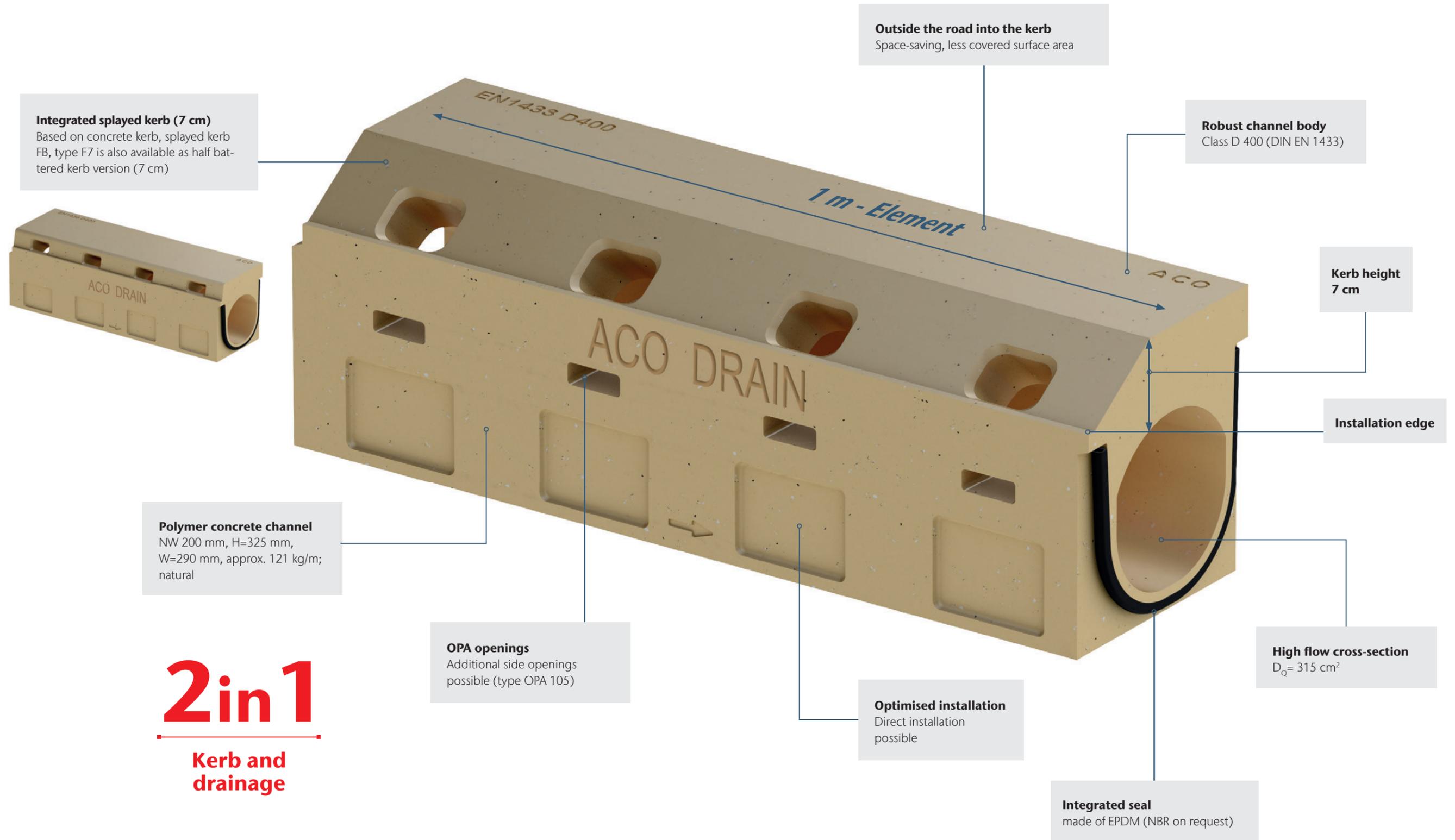
The 3-fold benefit of the new approach: the time-consuming installation of a concrete kerb is no longer necessary, the drainage is outside the road and at the same time facilitates rapid progress of construction work. In addition to the existing advantages of linear drainage of roads, as well as in combination with porous asphalt surfaces, there is a new kind of economic approach for federal traffic route construction.

ACO product advantages

- Drainage and kerb in one system
- No kerb and joint needed
- Time is saved during installation thanks to the installation from above
- Drainage outside the road
- Integrated seal for structural protection



ACO KerbDrain Road Splayed kerb channel



2in1
Kerb and drainage

KerbDrain Road modular system

The KerbDrain Road system is ideally suited for use on federal traffic routes, such as motorways or trunk roads. The optimum material properties of polymer concrete enable us to offer both robust (class D 400) and durable products for almost every application in the field of drainage technology. Furthermore, the extensive and very flexible system modules fulfil the wishes of almost every planner.

Our offer: askACO! Our experienced application technology team will be happy to assist you with your project.

System diagram KD Road splayed kerb FB-7 (version OPA 105)

- 1** Smooth universal closing end cap (to be bonded on site)
- 2** Sump unit combination f.e. short form (V300 cast iron grating/drainlock)
- 3** Channel L = 1 m (version OPA 105)
- 4** Fitting piece (cut on site)
- 5** Half adapter left (bonded on site)
- 6** Channel L = 2 m
- 7** Inspection element with cast iron grating NW 100/Drainlock
- 8** Dropped kerb left



Florian Meyer
ACO product manager

"The new kerb channel for the infrastructure of tomorrow".

"We have simplified motorway drainage for everyone involved in splayed kerb. In the future, drainage and kerbs will be integrated into one system. The time-consuming installation of a kerb is no longer necessary and therefore ensures rapid construction progress."

Advantages for the:

Planners

- Drainage outside the rode
 - Reduction of load on the components
 - 4-0 Traffic routing in the construction site area possible
- High hydraulic safety during heavy rainfall
- Continuous drainage by transition elements within road - bridge - tunnel areas
- An alternative to conventional point drainage

Operator

- 2in1 - Kerb and drainage in one system
- Long-lasting solution due to
 - Durable resistance of the material
 - Protection of the foundation thanks to integrated seal
- Hydraulic safety
 - If applicable longer maintenance intervals due to integrated sludge bucket
- Simple flushing procedure

Contractor

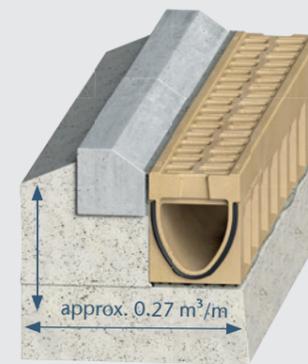
- Economical installation - kerb and drainage in a single installation step
- Reduced installation costs (material savings of concrete kerbs, joints, foundations)
- Reduced labour costs (no work crews needed for the installation of kerbs and joints)
- Quick installation due to placement from above

Convenient installation

Economical installation of kerb and drainage channel in one step

The situation today

Splayed kerb drainage channel

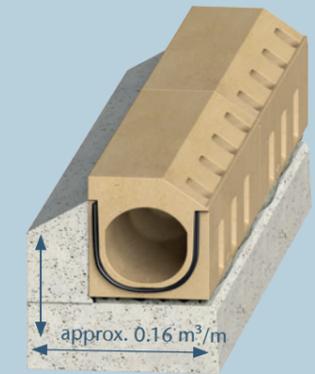


8 Work steps

- | | |
|----------------------|--------------------|
| 1. Foundation | 6. Kerb haunching |
| 2. Mortar bed | 7. Jointing step 1 |
| 3. Install channel | 8. Jointing step 2 |
| 4. Channel haunching | |
| 5. Laying kerbs | |

The situation in the future

Kerb channel



4 Work steps

1. Foundation
2. Mortar bed
3. Install channel
4. Channel haunching

ACO DRAIN® KerbDrain Road



Material savings:

- Concrete kerb not required
- **40 % less concrete required**

Reduced installation time:

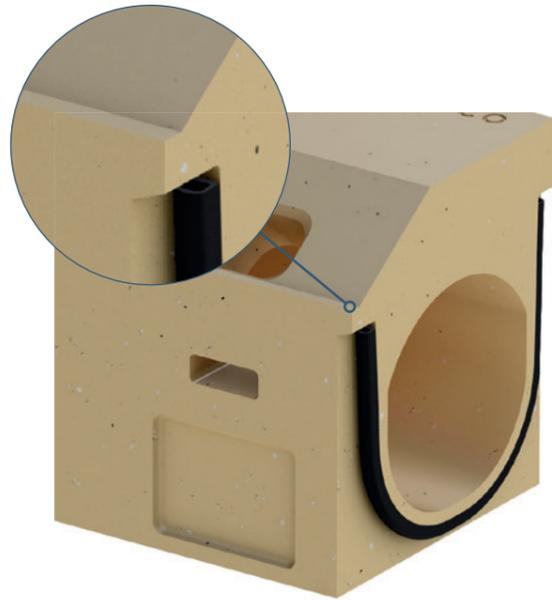
- Installation of an element
- **50 % fewer work steps**

Designed for the infrastructure of tomorrow

Installation edge

A new feature of the KerbDrain Road system is the integrated installation edge on all system elements. This offers three approaches for practical optimisation and minimises previous challenges faced by customers on site.

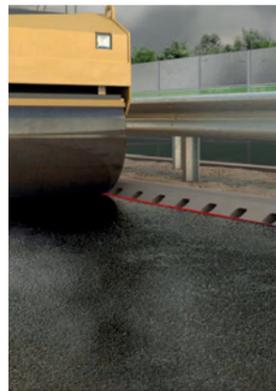
- Avoiding contamination of joint during installation.
- Continuous leading edge provides uninterrupted orientation for the road paver
- Continuous guidance for road pavers.



Avoiding contamination of joint during installation



Continuous guidance for road pavers



Optimal orientation for compacting machines

Transition kerb, Dropped kerb, Half battered kerb

Another new component for the linear kerb drainage of federal motorways and trunk roads will be the combination of the different maintenance groups (bridge or tunnel structures) with the help of planned transition kerbs. This means that in the future it will be possible to create a visually continuous drainage system. The soft run-off of the drainage can also be achieved thanks to lowering elements (from 7 to 0 cm kerb height).

The standard version of the KerbDrain Road shows a splayed kerb with 7 cm kerb elevation when installed. Alternatively, however, the version with a 7 cm half battered kerb elevation can also be used.

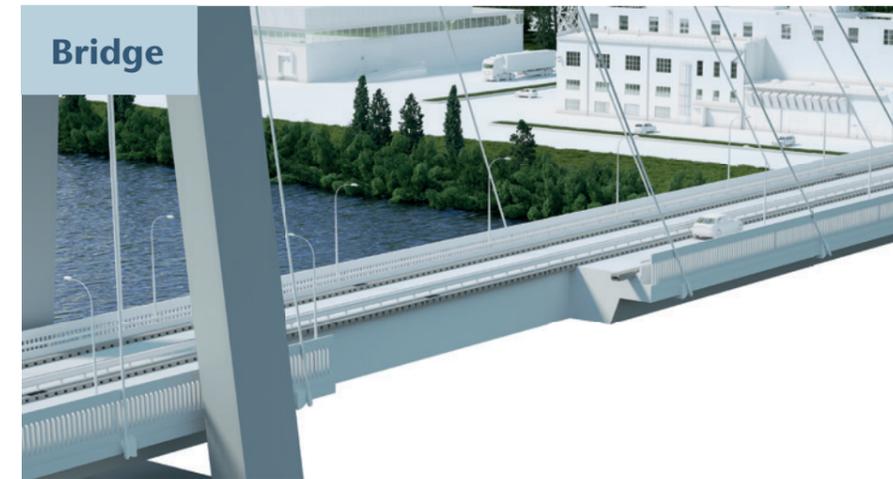


ACO combines...

3 applications – 2 functions – 1 system: **ACO KerbDrain**



Motorway

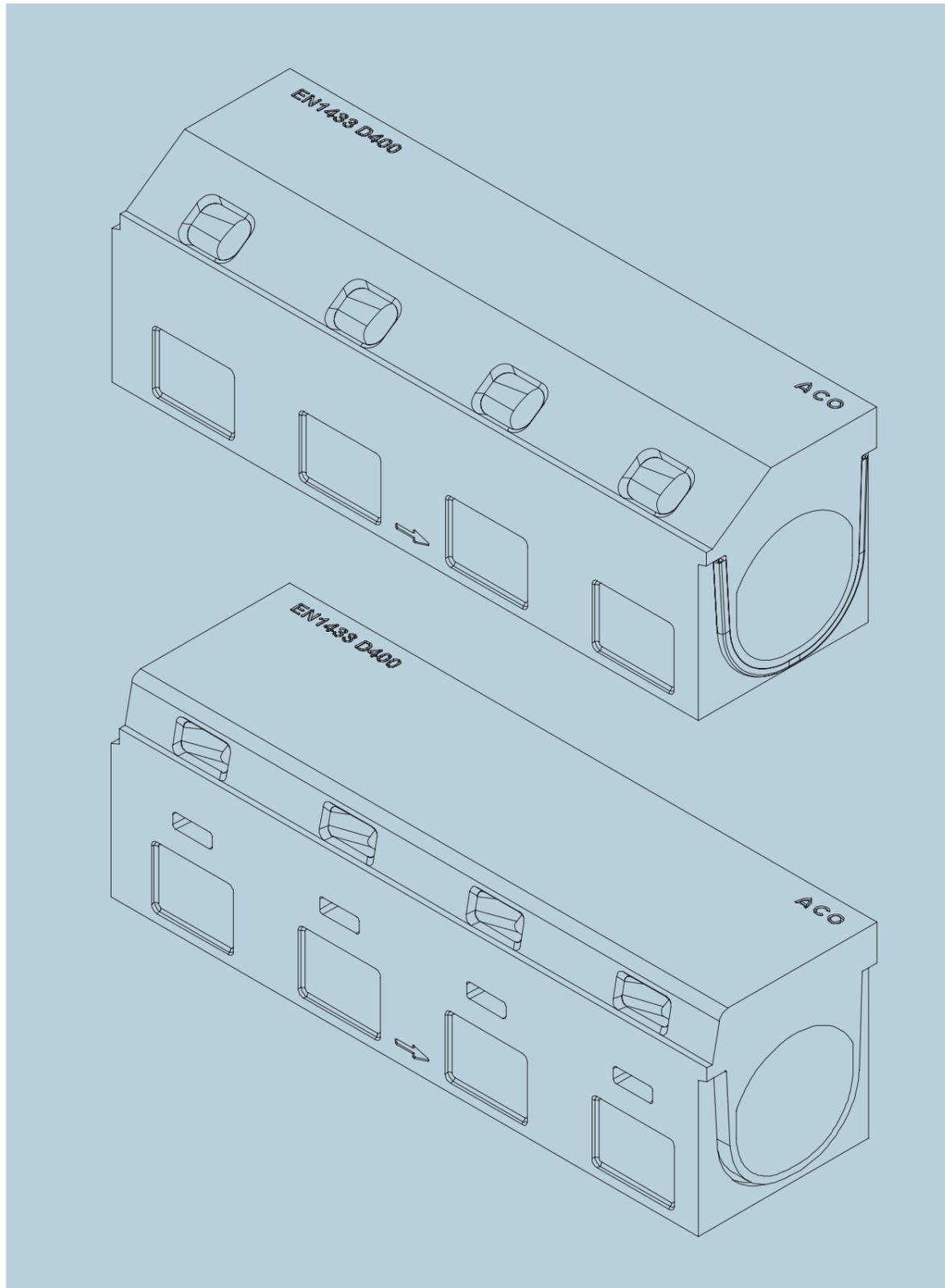


Bridge



Tunnel





Technical

details

KerbDrain Road

In addition to the usual sump units and inspection elements, adapters, end caps and other special components such as dropped and transition kerbs are also available. In addition to the splayed kerb version, a half battered kerb with a 7 cm kerb elevation can also be selected.

KerbDrain Road Splayed kerb

Channel body without bottom slope, KerbDrain Road FB 200-7

	Dimension			Type	Weight [kg/pc.]	Article no.
	Length	Width	Height start/end			
	[mm]	[mm]	[mm]			
	1000	290	325	Standard	121.0	299114
				OPA 105	120.0	299127

Revision element, KerbDrain Road FB 200-7

	Dimension			Type	Weight [kg/pc.]	Article no.
	Length	Width	Height start/end			
	[mm]	[mm]	[mm]			
	with cast-iron cover					
	1000	290	325	Standard 0.1	117.0	299116
	1000	290	325	OPA 105 0.1	116.0	299166
	with LLS pipe connection DN/OD 160 and Cast-iron cover					
	1000	290	325	Standard 0.2	116.0	299117
	1000	290	325	OPA 105 0.2	115.0	299167

Sump unit, KerbDrain Road FB 200-7

	Dimension			Pipe connection DN/OD [mm]	Weight [kg]	Article no.
	Length	Width	Height			
	[mm]	[mm]	[mm]			
	Upper part					
	550	500	365	-	112.0	299118
	Bottom part short form, with LLS pipe connection DN/OD 160 and 200					
	500	230	365	160	26.5	10935
				200	26.5	10936
	Bottom part long form with 45° connection as wet sludge trap					
	500	324	715	160	68.0	132513
	Sump unit as a special inspection element, with LLD pipe connection to the rear					
	500	230	355	160	119	299158
				200	118	299159

KerbDrain Road FB 200-7 accessories

Acknowledge description	Remark	Weight [kg]	Article no.
Universal closing end cap made of polymer concrete ■ Overall length: 50 mm	To be bonded on-site, on-site cutting may be necessary	11	299120
Adapter to change flow direction made of polymer concrete ■ Overall length: 200 mm ■ with integrated EPDM seal (2x)	2x seal	26	299122
1/2 Adapter for fitting piece made of polymer concrete ■ Overall length: 100 mm ■ with integrated EPDM seal	to be bonded on-site 1x seal left type	13	299121
	to be bonded on-site 1x seal right type		299107
Polyester bonding compound ■ for on-site bonding ■ 0.5 kg container	for bonding polymer concrete prefabricated parts	0.9	02163

KerbDrain Road Half battered kerb

Channel body without bottom slope, KerbDrain Road HB 200-7

	Dimension			Type	Weight [kg/pc.]	Article no.
	Length	Width	Height start/end			
	[mm]	[mm]	[mm]			
	1000	290	325	Standard	126.0	299140
OPA 105				125.0	299154	

Revision element, KerbDrain Road HB 200-7

	Dimension			Type	Weight [kg/pc.]	Article no.
	Length	Width	Height start/end			
	[mm]	[mm]	[mm]			
	with cast-iron cover					
	1000	290	325	Standard 0.1	122.0	299142
	1000	290	325	OPA 105 0.1	121.0	299128
	with LLS pipe connection DN/OD 160 and Cast-iron cover					
	1000	290	325	Standard 0.2	121.0	299143
	1000	290	325	OPA 105 0.2	121.0	299129

Sump unit, KerbDrain Road HB 200-7

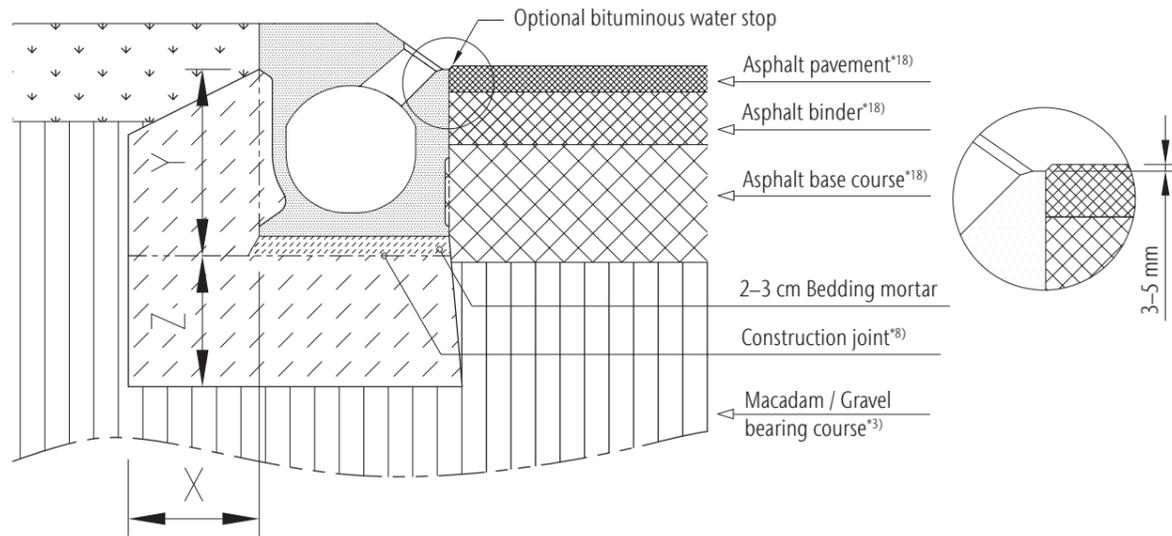
	Dimension			Pipe connection DN/OD [mm]	Weight [kg]	Article no.
	Length	Width	Height			
	[mm]	[mm]	[mm]			
	Upper part					
	550	500	365	-	112.0	299145
	Bottom part short form, with LLS pipe connection DN/OD 160 and 200					
	500	230	365	160	26.5	10935
				200	26.5	10936
	Bottom part long form with 45° connection as wet sludge trap					
	500	324	715	160	68.0	132513
	Sump unit as a special inspection element, with LLD pipe connection to the rear					
	500	230	355	160	119	299162
				200	118	299163

KerbDrain Road HB 200-7 accessories

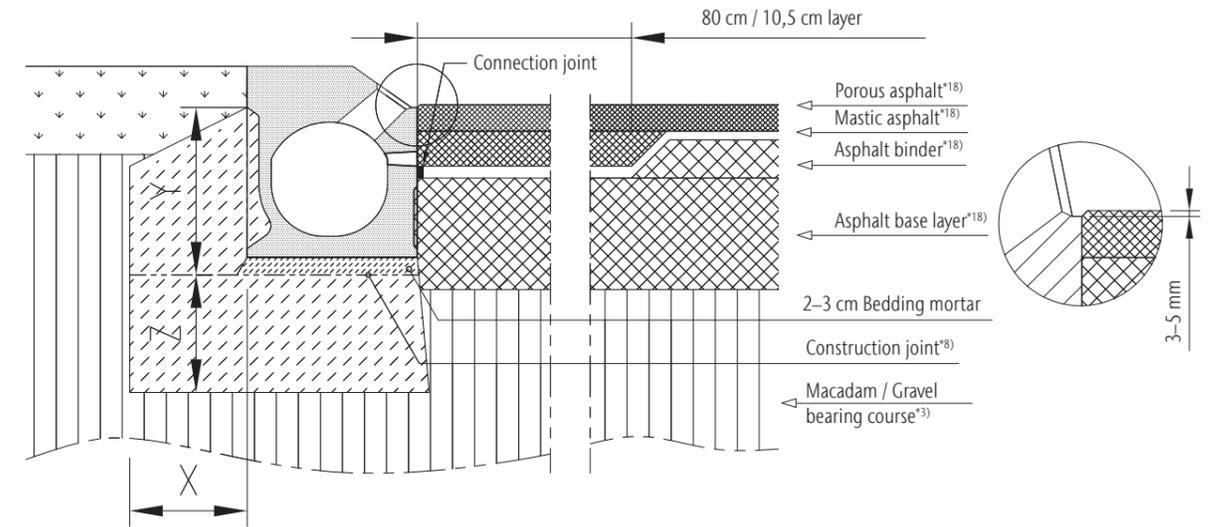
Acknowledge description	Remark	Weight [kg]	Article no.
Universal closing end cap made of polymer concrete ■ Overall length: 50 mm	To be bonded on-site, on-site cutting may be necessary	11	299147
Adapter to change flow direction made of polymer concrete ■ Overall length: 200 mm ■ with integrated EPDM seal (2x)	2x seal	26	299149
1/2 Adapter for fitting piece made of polymer concrete ■ Overall length: 100 mm ■ with integrated EPDM seal	to be bonded on-site 1x seal left type	13	299148
	to be bonded on-site 1x seal right type		299135
Polyester bonding compound ■ for on-site bonding ■ 0.5 kg container	for bonding polymer concrete prefabricated parts	0.9	02163

Installation recommendations, splayed kerb type FB-7

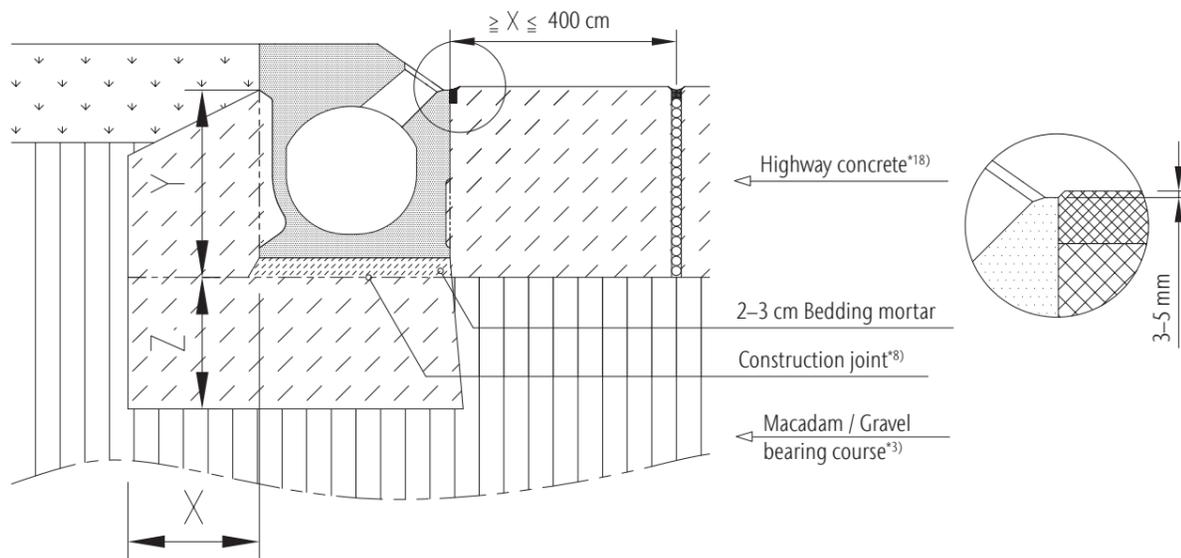
Installation example asphalt, class D 400



Installation example porous asphalt (OPA 105), class D 400



Installation example concrete, class D 400



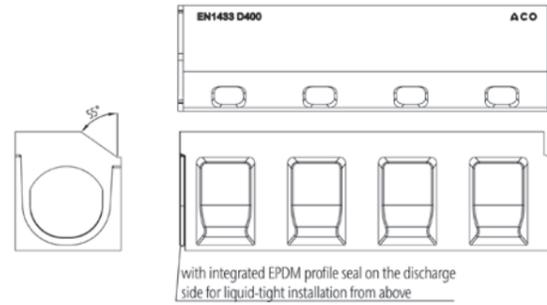
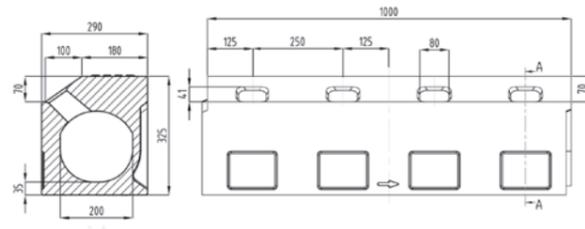
Class (according to DIN EN 1433)	A 15	B 125	C 250	D 400	E 600	F 900
Minimum - foundation concrete - quality (according to EN 206 -1)				C 20/25		
Exposure class				(XF2)		
Foundation dimensions - type M (according to EN 1433)				≥20		
	X [cm]					
	Y [cm]					
	Z [cm]					
				Top edge anchoring pocket		
				≥20		

*High-strength, frost and de-icing salt resistant, shrinkage-free, e.g. mortar (bagged) from P& T Mortar, Pagel, Ergelit, etc.

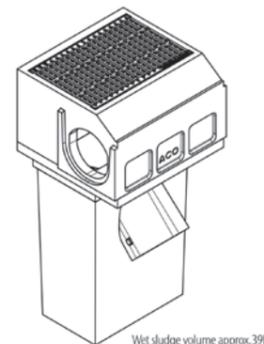
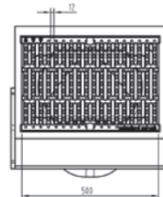
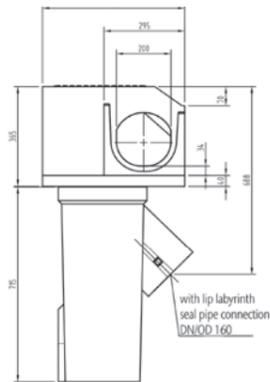
All installation recommendations shown apply only in conjunction with the preliminary remarks of our general installation instructions.

Product drawings

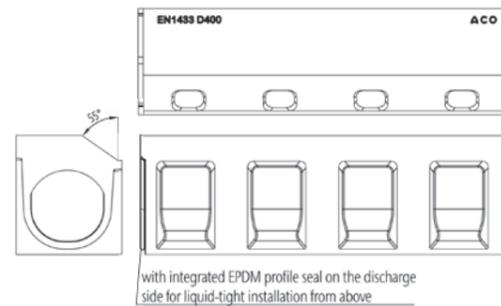
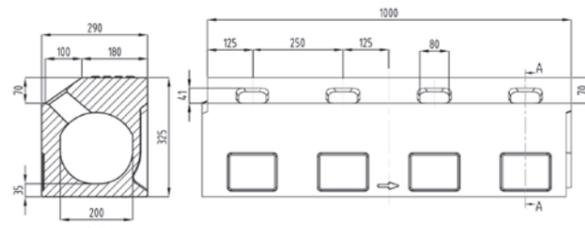
Splayed kerb channel (Type FB-7)



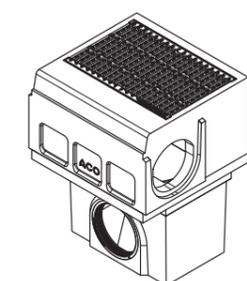
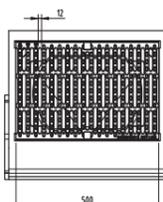
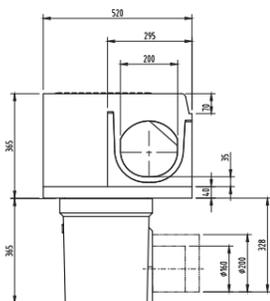
Half battered kerb sump unit long form (Type FB-7)



Half battered kerb channel (Type HB-7)



Raised kerb sump unit short form (Type HB-7)



Any questions?

askACO



Our invitation for you: askACO

Together we will find the right solution to your specific drainage requirements.
www.aco.com

ACO drainage systems for roads and highways

As a global market leader in drainage technology, ACO has set itself the challenge of developing special products for road and highway construction and its associated infrastructure. The diverse range of climatic conditions and the respective local variations require solutions that are both ecological and economical. ACO drainage systems include not only standard products such as the KerbDrain Road system, but also

solutions that are created specifically to suit the needs of particular projects. In addition to our products, we are proud to offer our experience and service, which allow us to work with you to develop customised solutions. ACO's technical expertise is always on hand when you need it. From the initial designs to commissioning and everything in between, our engineers are here to help you.

www.aco.com

Every ACO product supports
the ACO system chain



-
- Drainage channels
 - Road and yard drains
 - Gully tops
 - Manhole covers
 - Rainwater treatment
 - Infiltration and attenuation
 - Pump shafts
 - Flow control systems
 - Tree protection
 - Amphibian protection
-

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**ACO. creating
the future of drainage**

