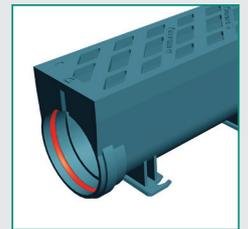
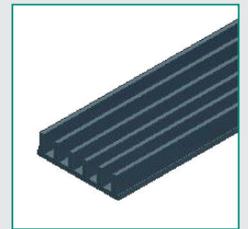


# HYDROTEC

*Technologies*



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*Technical Manual*

# DRAINAGE CHANNELS

## IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

### General notes

The installation instructions contained in this manual are only provided as a recommendation. The construction companies charged with installation can naturally incorporate any of their own improvements. The construction company is responsible for the correct installation of the drainage channels. This means that the latest version of all technical regulations must be observed and complied with.

Today there are a number of conventional installation methods. The selection of the best method for your project is the responsibility of the respective planning engineer who has the necessary knowledge to assess the respective situation. There is also a wide range of concrete qualities on the market and their suitability can best be judged by the planning engineer.

All installed parts must be examined before installation to ensure that they are undamaged. For reasons of liability never install damaged parts and contact the supplier immediately to submit a claim.

### In general the following applies for the installation instructions contained in this document:

1. The drainage channel laying method depends on the installation location, corresponding traffic loads, and the planned top course. The installation locations are classified in DIN EN 1433 in the classes A15 to F900. From class C 250 onwards, all gratings must be anchored to ensure traffic safety. The foundation of the drainage channel must be suitable to bear the traffic load.
2. Horizontal traffic loads and the thermal behaviour of the top course must be compensated by adequately dimensioned concrete encasement of the channel body and also by expansion joints running lengthways on the channel, especially in directly adjoining concrete surfaces. Joints at right angles to the channel must always be implemented as butt joints.
3. The laying direction of the channel is always opposite to the direction of flow and starts at the ground pipe union. Adjoining surfaces must be executed to be approx. 3 to 5 mm higher than the top edge of the grating or edge protection, taking settling and compression into account.
4. Undermining and washing out of the top course and channels must be prevented by suitable measures.
5. If extreme horizontal forces exerted at right angles to the channel are expected, e.g. at railway crossings, ramps or motorways, the drainage channels should be secured at the sides with a reinforced concrete top course.

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## IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

### Fibre-reinforced concrete

The basic materials of the fibre-reinforced concrete are always selected by HYDROTEC in compliance with ecological considerations. The basis of concrete is simple and nature supplies what is needed for its production. Cement made of limestone and clay as well as an aggregate of sand or gravel and also water. The overall reserves of these raw materials are adequate for long-term use.



### HYDROTEC drainage systems made of reinforced concrete have outstanding features:

- Properties such as strength and durability are calculated for conventional top course types (concrete bricks, asphalt, concrete)
- Frost-resistance to the eco-standard & DIN EN 1433
- Perfect interaction with the foundation due to the mass and form of the channels. A wide contact surface guarantees stability during installation
- Optimum connection between the cast iron and concrete
- Non-flammable in compliance with DIN 4102
- Environmental regulations are fully met, as concrete is 100% recyclable

### Strength is increased by the additional reinforcement of the concrete with fibres:

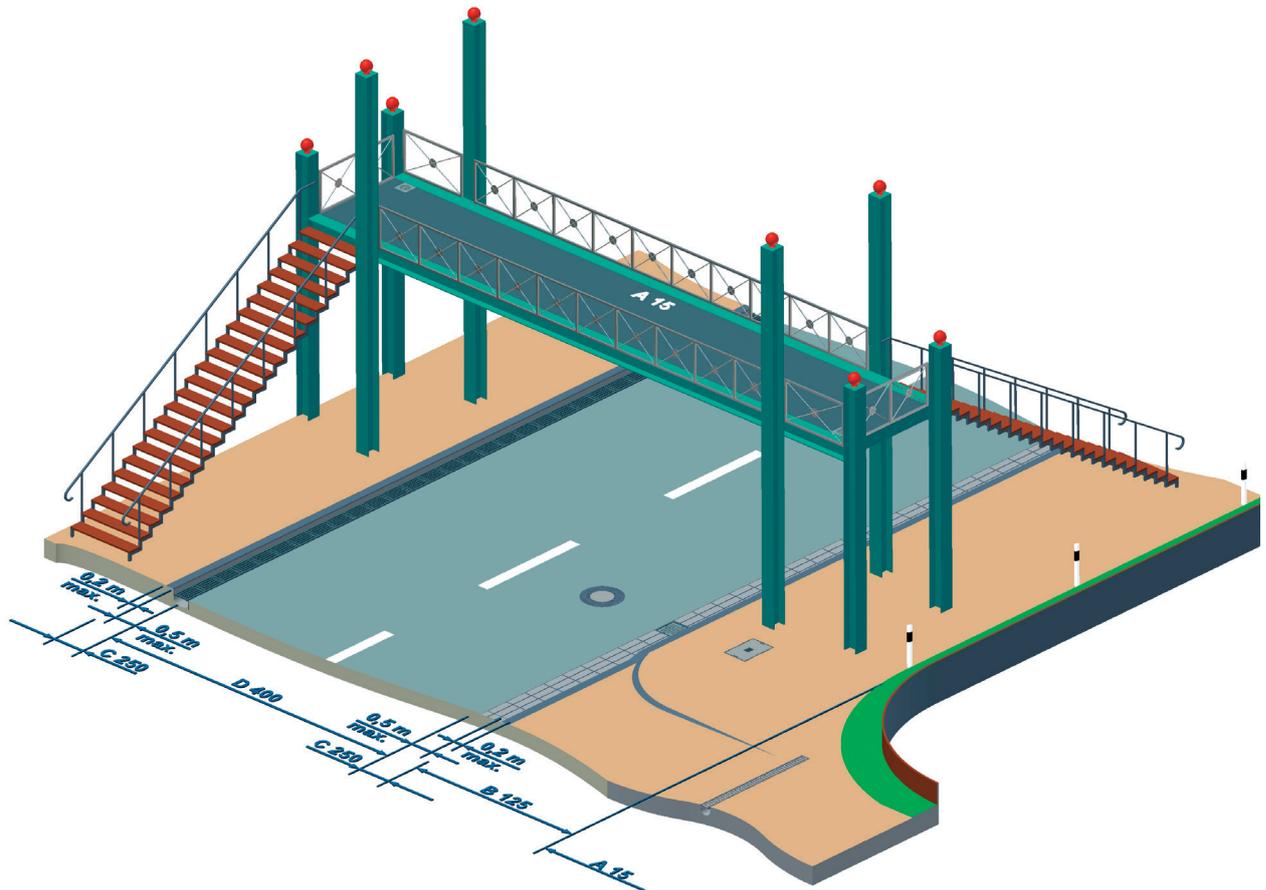
- The formation of cracks due to shrinkage and tension is effectively minimised
- Flexural tension, pressure and splitting tensile strength are improved
- Resistance to freeze-thaw cycles is increased
- The minimum water penetration depth ensures water impermeability in compliance with DIN EN 206

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## IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

### Load classes to DIN EN 1433



**Group 1**  
min. Class A 15

Traffic areas used only by pedestrians and cyclists and similar areas, e.g. greenspace



**Group 2**  
min. Class B 125

Pavements, pedestrian areas and similar surfaces, e.g. parking space for cars and multi-story car parks



**Group 3**  
min. Class C 250

Gully tops / drainage channels in the area of the kerbside and for emergency lanes in road construction



**Group 4**  
min. Class D 400

Road surfaces (incl. pedestrian streets), parking lots and similar, paved traffic areas, e.g. car parks on public freeways



**Group 5**  
min. Class E 600

Non-public traffic areas used by vehicles with a particularly wheel load, e.g. traffic routes in industrial building, dock facilities



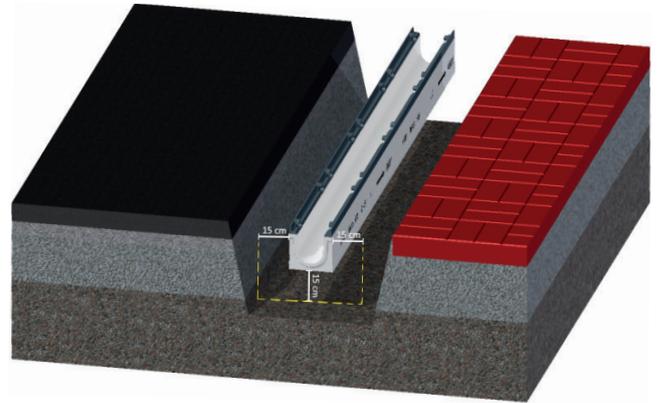
**Group 6**  
min. Class F 900

Special areas e.g. flight operation areas at airports

# IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

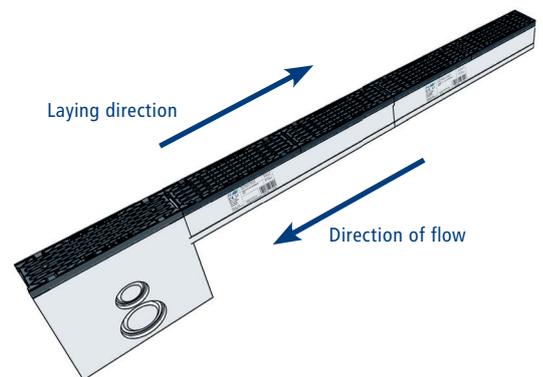
## Installation instructions

1. Excavate the pit with an adequate width so that a concrete encasement of at least 15 cm (class C250) can be installed. The thickness of the encasement varies depending on the installation situation and load class. Further information on the thickness of the concrete encasement is contained in our installation instructions.

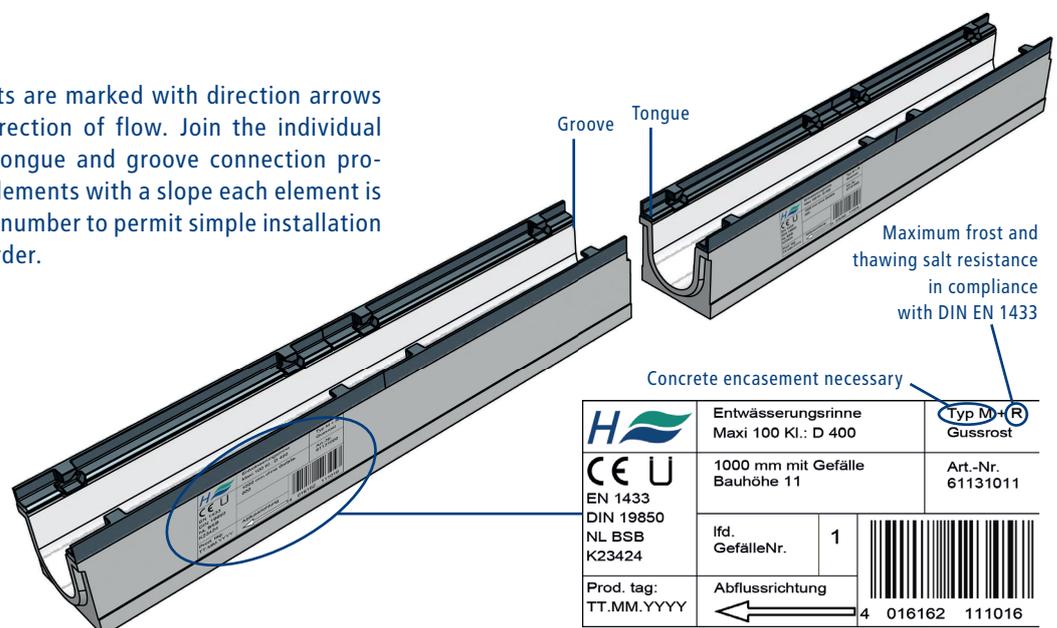


Installation example "MAXI" system – C250

2. Before laying the channel elements (gratings can be removed for laying), span a cord and ensure that the concrete bed is sufficiently thick (e.g. C250 = min. 15 cm). The laying direction of the channel elements is always opposite to the direction of flow and starts at the ground pipe union or the feed box! The same installation instructions apply for feed boxes as for the drainage channels.



3. The channel elements are marked with direction arrows that indicate the direction of flow. Join the individual elements with the tongue and groove connection provided. On channel elements with a slope each element is marked with a serial number to permit simple installation in a chronological order.



## IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

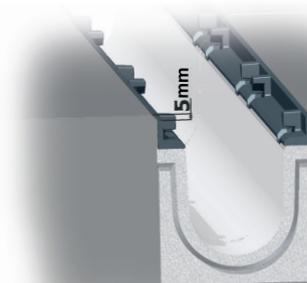
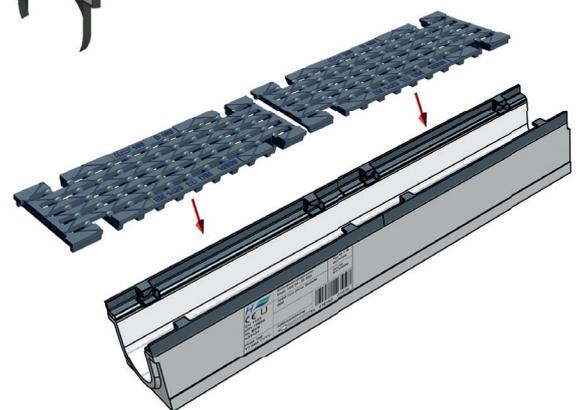
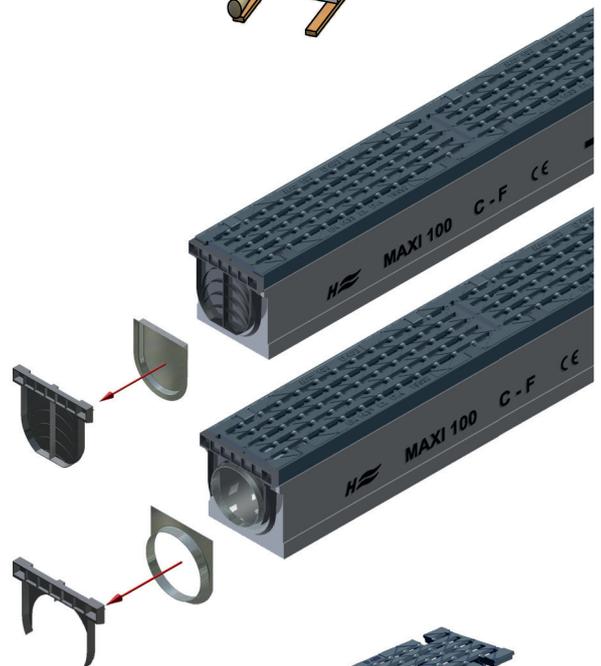
### Installation instructions

4. We recommend using two wooden slats underneath channel elements with a precast outlet to remove the precast section from the channel by tapping lightly with a hammer. A detailed video guide for removing the preformed section is available for viewing at [www.hydrotec.com](http://www.hydrotec.com)

5. After laying the channel, fit the end sections at the beginning and end of the channel to connect the outlet point to the drainage system.

6. The concrete encasement can then be provided while ensuring that the gratings are once more placed in the channel elements to protect the channel body against horizontal forces. When laying the channels in concrete, configuration of expansion joints is specified, and existing expansion joints are continued throughout the channel run.

7. When laying the adjoining top course, always ensure that the top edge of the drainage channels is seated permanently 3-5 mm lower than the adjoining surface.



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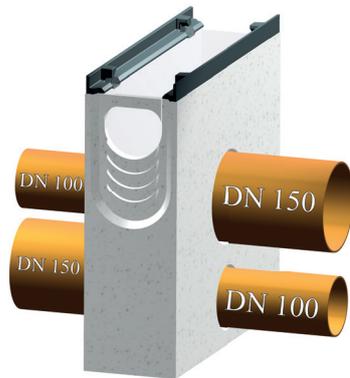
# IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

## Connection options, feed box

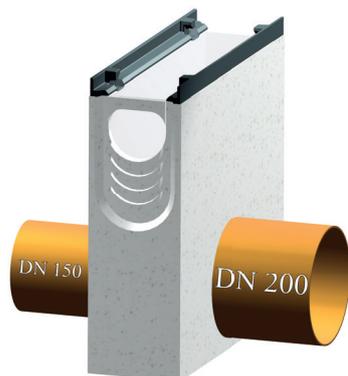
### SYSTEM MINI 100



### SYSTEM TOP 100 / MAXI 100 / 150 / 200



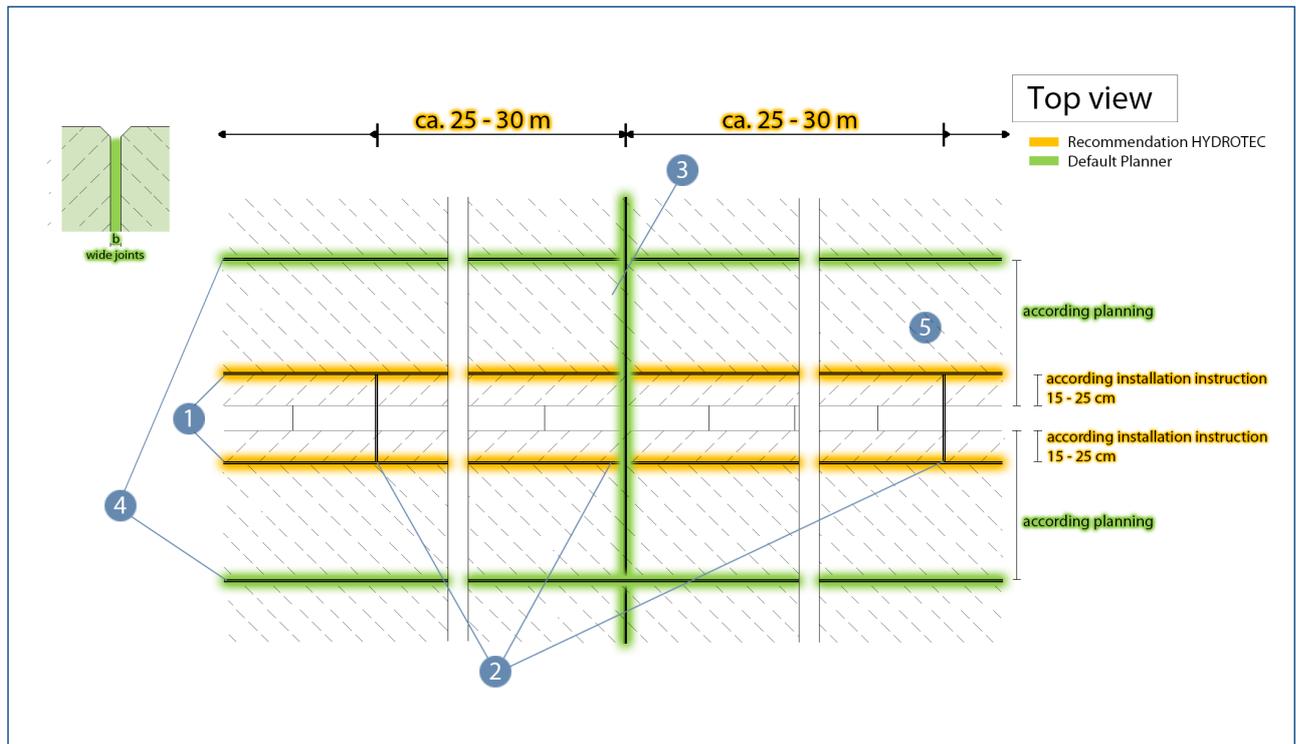
### SYSTEM MAXI 300



## IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

### Expansion joint requirements

If the project planning engineer or architect do not have any specifications, we recommend configuring the expansion joints as shown in the following figure:



1. Positioning of the expansion joints depends on the channel type selected for the respective construction project. We recommend positioning the joint above the outer edge of the concrete encasement.
2. Expansion joints should always be positioned vertically in relation to the channel in the concrete encasement. We recommend a distance of approx. 25 – 30 m. The joint width must be specified by the project planning engineer. As a general rule, always comply with the planning engineer's specifications!
3. When configuring the expansion joints in the concrete top course, always comply with the specifications of the project planning engineer or architect.
4. Furthermore, expansion joints must also be positioned parallel to the channel run. In this respect contact the project planning engineer for information on the expansion joints running parallel to the channel run. Never position expansion joints directly between the channel and the adjoining concrete encasement!
5. Top course of concrete

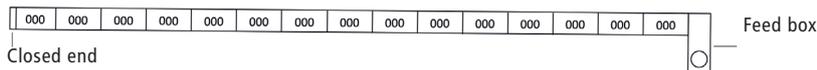
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# IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

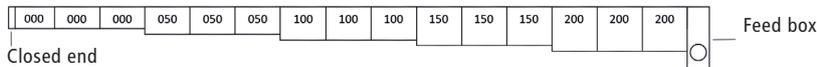
## Summary of slope types

### Channel run without slope



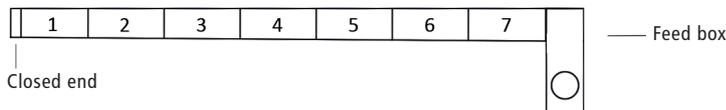
The channel run is straight, and drainage is achieved by the existing slope of the respective road surface. The drained water is fed into the drainage system through a feed box.

### Channel without slope (stepped slope)



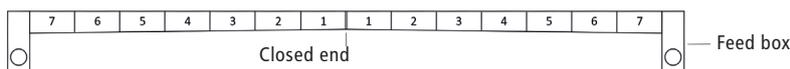
Constant drainage is achieved by connecting channel elements with different constructional depths. The channel run can be connected to the drainage system by means of an open end.

### Channel run with integrated slope



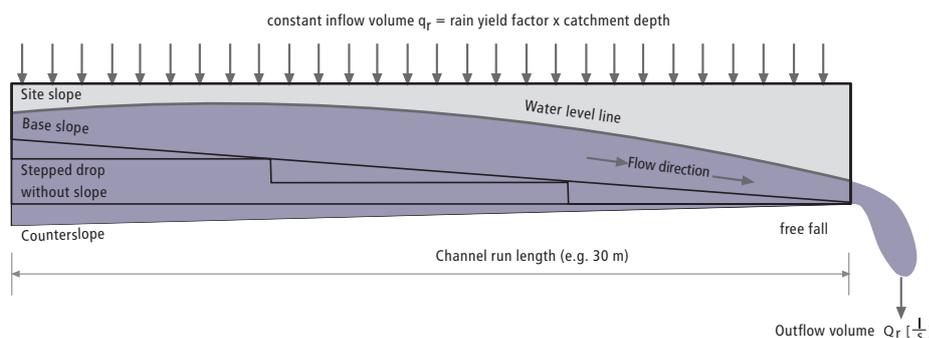
In this case drainage is achieved by a continuous integrated slope. The channel run has an integrated linear slope with a continuous inclination of 0.5 % or 1.0 %. The channel can be connected to the drainage system directly with a feed box.

### Channel with integrated slope (counter-slope)



In this case drainage is achieved by means of a continuous, integrated slope that is interrupted in the middle of the channel run. If channel elements are laid in two directions, it is necessary to join two counterfacing elements. We therefore recommend using a face end to prevent the formation of a gap.

### Outflow volume / Water level / Base formation



The shape of the channel base with or without slope has no effect on the inflow volume of the channel run. The water level line is always the same. The inflow volume is only determined by the channel cross-section at the end of the channel run, the slope has no impact at all.

**Result:**  
**Less effort without slope**

**For hydraulic reasons we recommend drainage without slopes!**

## IMPORTANT INFORMATION AND INSTALLATION INSTRUCTIONS

### Project-specific planning

HYDROTEC offers support at the planning stage.

We can help you with the hydraulic calculations so that you know as quickly as possible which drainage systems meet your requirements.

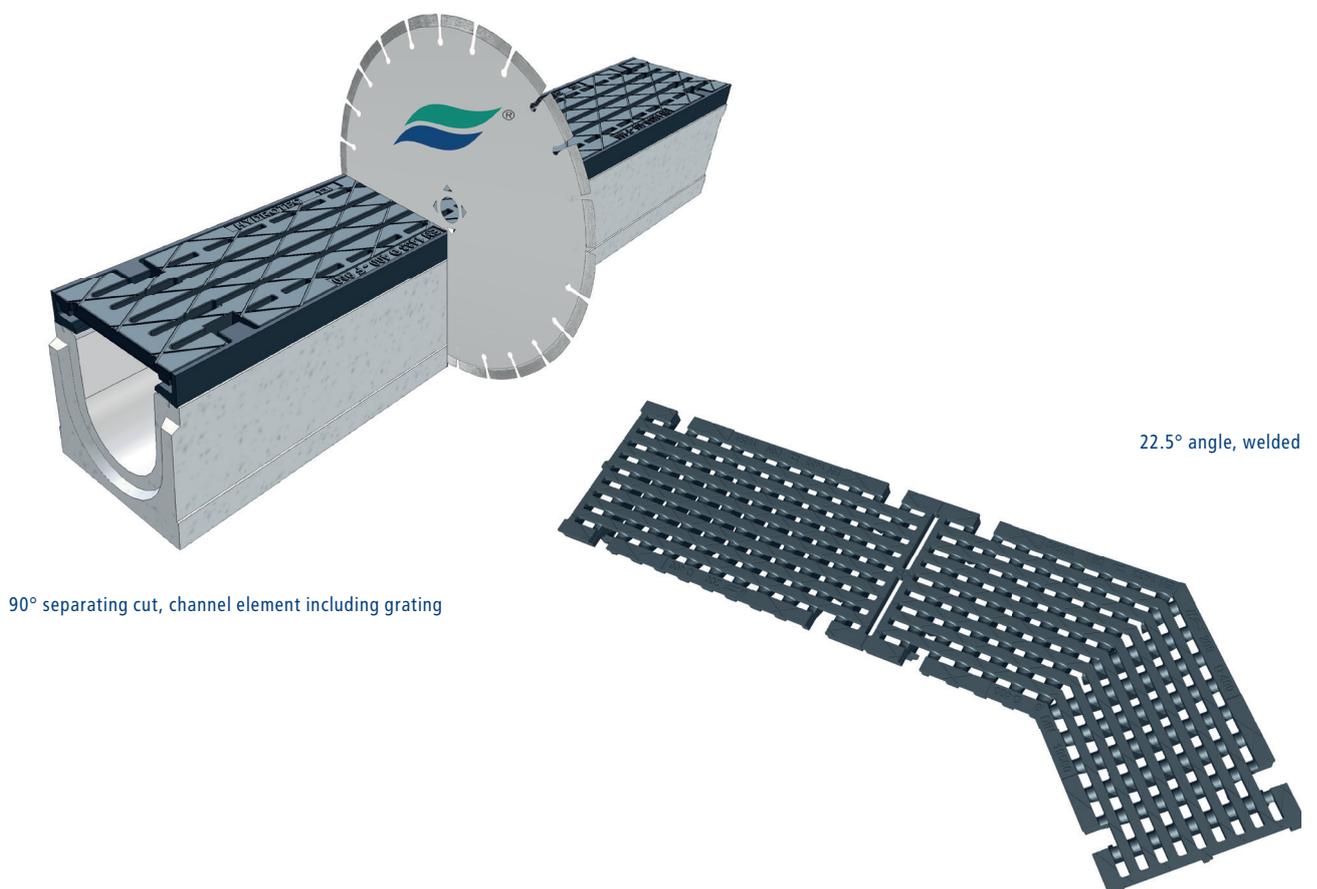
We also assist you in positioning the drainage systems and draw up installation plans with you to ensure optimum drainage.

HYDROTEC adapts to the individual needs of each customer.

With our cutting service the channel elements can be cut off at right angles, at a specific angle or as a mitre cut to suit your requirements exactly.

We naturally also provide assistance in determining the exact angle in degrees etc. As a result the individual channel elements can be fitted more easily and quickly.

As our customer you therefore profit from being able to work **efficiently** and in particular **economically**.



## SYSTEM MINI 100

### System MINI

- Simple system for trouble-free DIY projects
- Available in elements with a length of 500 and 1000 mm
- Clever profile at the ends for simple connection
- Precast section (DN 100) provided in each channel element for a vertical outlet
- Slotted grating, mesh grating and cast grating for exact connection between the channel and the adjoining road surface



**Facing profile for exact fit**  
The profile serves for fast and simple connection of the channels

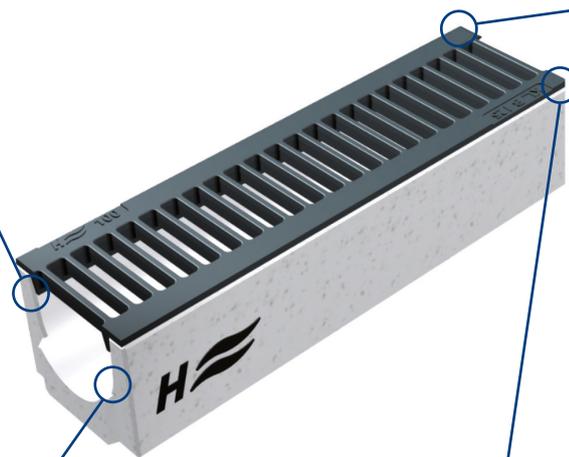


**MINI 100 grating range**

- Galvanised slotted grating
- Galvanised mesh grating
- Cast grating



**Vertical outlet**  
Each channel element features a precast outlet section for connection of the channel to the ground pipe, for example.



**Fibre-reinforced concrete**  
We use concrete of strength class C35/45 combined with plastic fibres for the production of our drainage channels.

## SYSTEM MINI 100

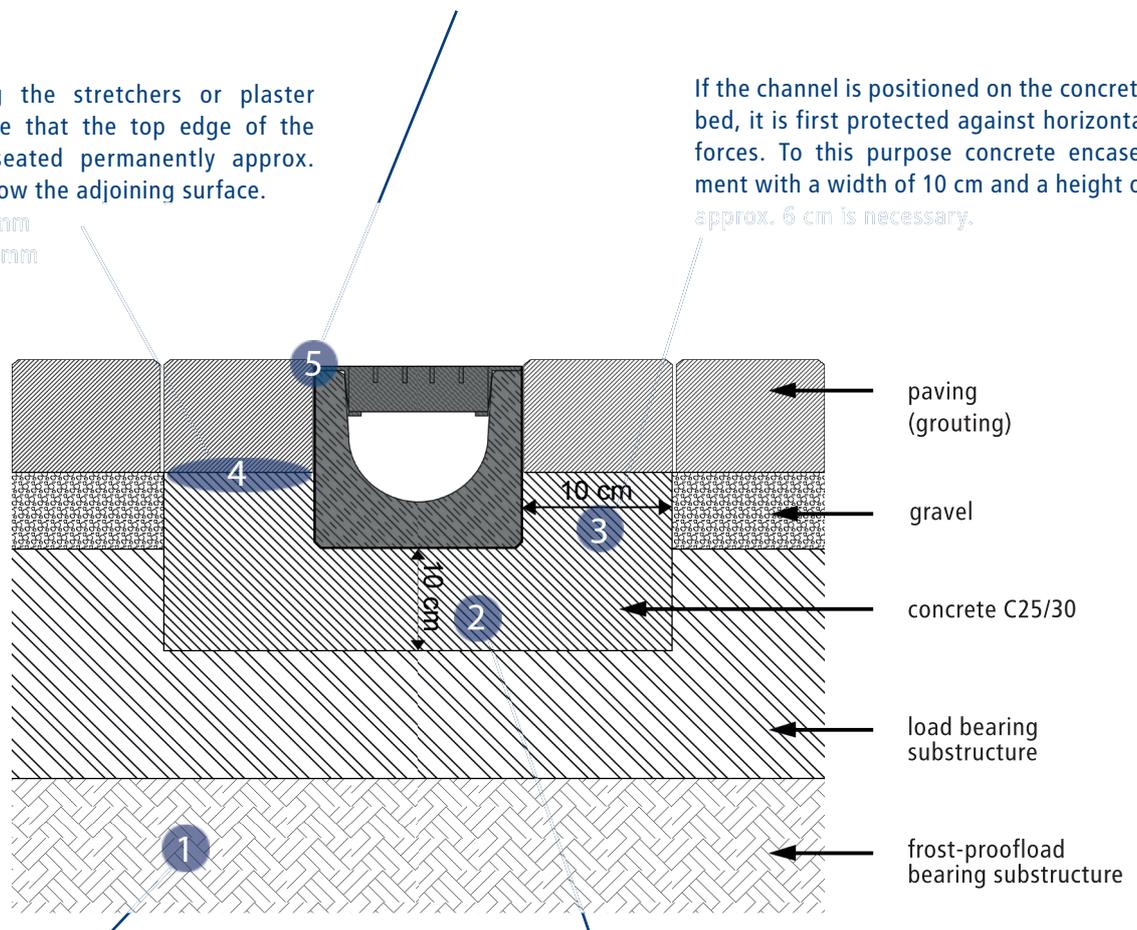
### Installation instructions MINI (class A 15 – B 125)

The stretchers on the right and left along the channel must be laid in fresh concrete and then backfilled with cast concrete or grouting mortar.

When laying the stretchers or plaster stones ensure that the top edge of the channel is seated permanently approx. 3 – 5 mm below the adjoining surface.

Asphalt = 5 mm  
Concrete = 3 mm

If the channel is positioned on the concrete bed, it is first protected against horizontal forces. To this purpose concrete encasement with a width of 10 cm and a height of approx. 6 cm is necessary.



Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must be correctly compressed (depending on the load class) to prevent "sinking" of the channel. Generally this is determined by the project planning engineer or structural engineer.

When the MINI system is installed, a concrete bed in compliance with load class (A15 / B125) is laid. When a class A 15 channel system is installed, the channel must be laid on a layer of at least 5 cm of concrete (C25/30). Channel systems of class B125 require a concrete bed with a thickness of 10 cm.

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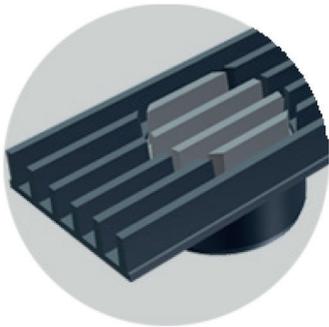
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## SYSTEM HYDROline

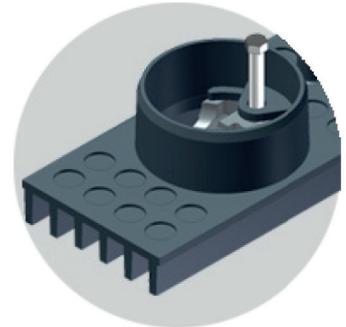
### System HYDROline

- Flat channel made of ductile cast iron as a solution for special applications
- Also acts as an evaporation channel
- Suitable for areas with little overhead space such as indoor car parks or underground car parks
- Optimum solution for renovation projects due to its simple installation
- Particularly easy to clean and very strong
- 3 concrete anchors as well as a grooved underside ensure firm connection to the concrete
- Projection at the side interlocks with the substrate
- Standard element 1000 mm / outlet element 500 mm



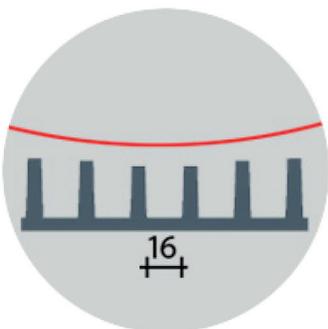
#### Outlet drain element

Outlet drain element with an easily removable grating and integrated connection for a KG pipe (DN 100)



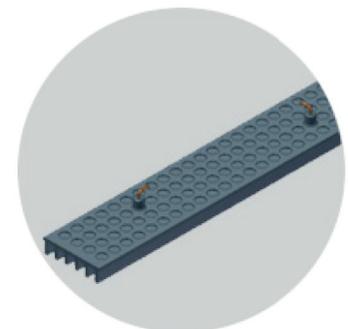
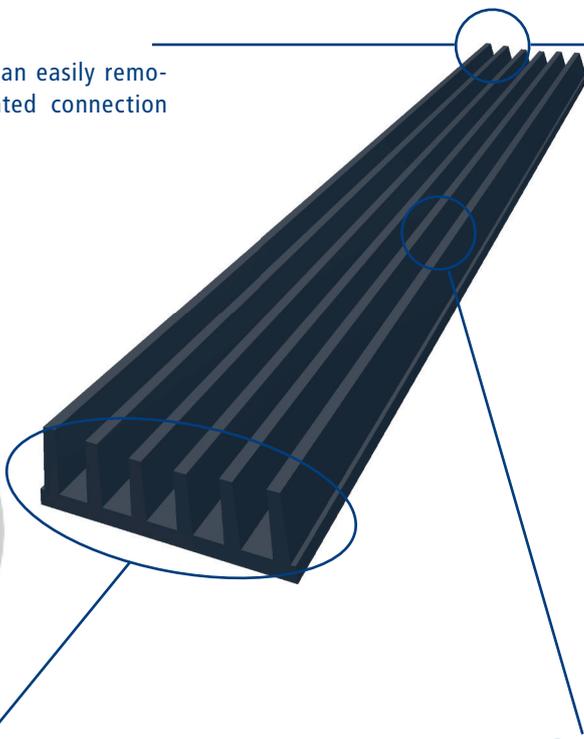
#### Grating fixture

The grating is secured by a bar as protection against theft and vandalism



#### Concave arrangement

The concave arrangement of the slots serves to enhance the transport energy so that the water is well drained even on slight slopes. This in particular prevents flooding.



#### Concrete anchor

HYDROline features three concrete anchors, and these combined with the grooved underside ensures a very strong connection with the concrete. Due to this firm connection the flat channel is rattle-free.

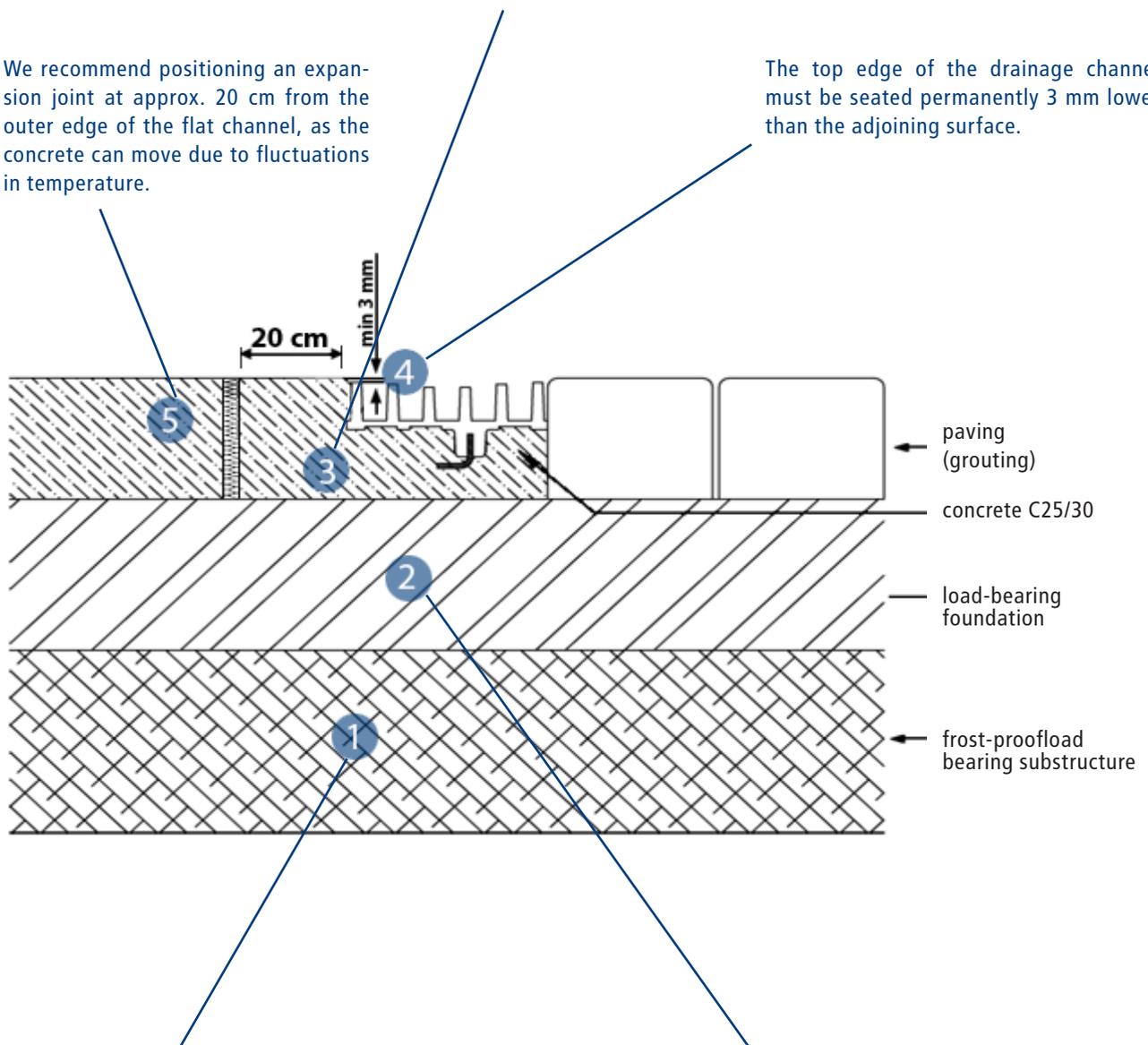
## SYSTEM HYDROline

### Installation instructions HYDROline (class A 15 – F 900)

If the conditions described in sections 1 and 2 are met, the HYDROline flat channel can be installed with the aid of concrete (C25/30). The concrete anchors and lengthways grooves ensure a firm connection with the concrete.

We recommend positioning an expansion joint at approx. 20 cm from the outer edge of the flat channel, as the concrete can move due to fluctuations in temperature.

The top edge of the drainage channel must be seated permanently 3 mm lower than the adjoining surface.



Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must be correctly compressed (depending on the load class) to prevent "sinking" of the channel. This is generally specified by the project structural or planning engineer.

A prerequisite for the installation of the HYDROline is an existing foundation to bear loads. The dimension or thickness of the foundation depends on the structural calculations for the respective construction project as well as the selected load class.

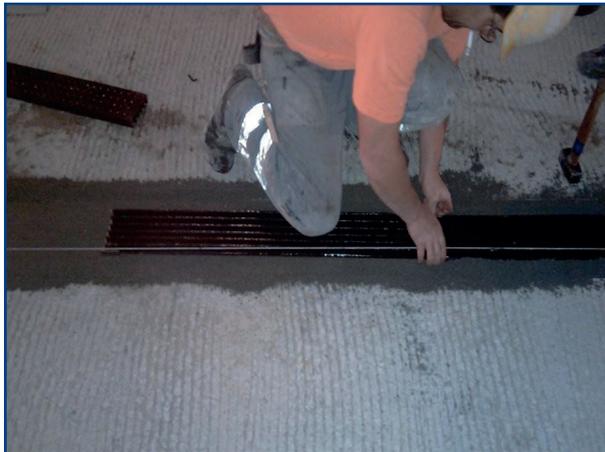
## SYSTEM HYDROline

### Laying instructions HYDROline

The HYDROline flat channel is suitable for installation in an existing recess (e.g. for renovation) or for installation in homogenous concrete with the aid of the mounted installation aids. The existing base course must be examined and approved by the architect or planning engineer depending on the required load class.

#### Installation version A (existing recess)

Fill the existing recess with fresh concrete and lay down the HYDROline using a cord. Furthermore it must be ensured that one end section is positioned at the end and at the beginning of the channel run.



The channel run is started with the outlet drain element. The individual elements are connected with a connection element. The flat channel snaps easily into the connection element.



The channel must be seated at least 3mm lower than the adjoining surface.

#### Installation version B (homogenous concrete)

When installing the HYDROline in homogenous concrete we recommend the use of the HYDROTEC installation supports. The installation support and the connection element permit exact installation at the correct height.



The installation supports must be placed at the joints of the HYDROline. In this case we also recommend placing end sections at the beginning and end of the channel.



Before laying down the concrete layer the flat channel must be covered and taped to prevent the ingress of concrete.

The channel run must be at least 3mm lower than the adjoining surface.

## SYSTEM TOP 100

### System TOP 100

- The TOP system covers the load classes A 15 – C 250
- Ideal for cycle paths and footpaths or car parks
- Modular system ensures uncomplicated installation
- Pre-cast section at the base for a vertical outlet drain (DN 100/150)
- Exact connection profile for simple connection
- Secure rebated joint
- Channel made of fibre-reinforced concrete, strength class C35/45



#### Screwless locking system

The patented HYDROTEC locking system permits convenient opening of the drainage channel. The feed box can be easily localised by the red locking rods



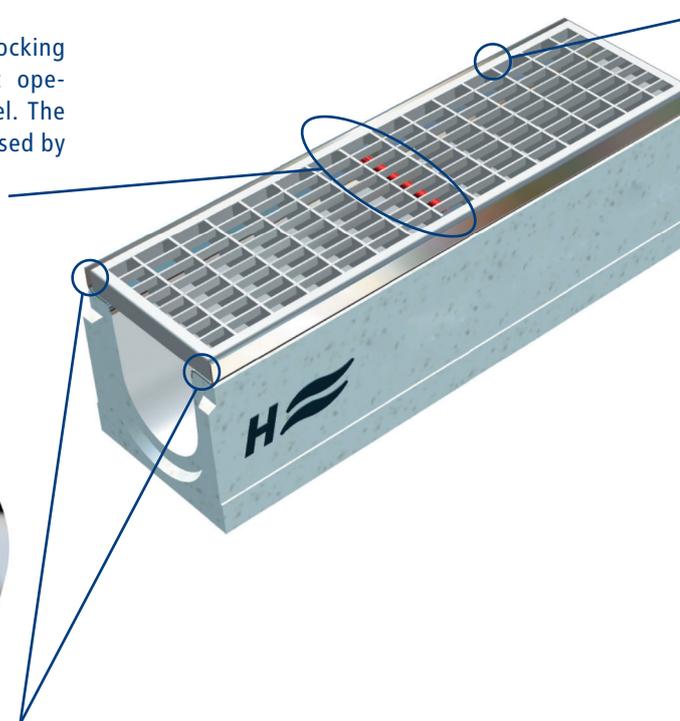
#### TOP 100 grating range

- Cast grating
- Galvanised mesh grating
- Galvanised slotted grating



#### Edge protection of galvanised steel

Hot-dip galvanised steel ( $>60\mu\text{m}$ ) acts as edge protection that is firmly anchored in the concrete and therefore ensures maximum stability



#### Special cross element

The special TOP 100 element permits extension of the channel run with the required branches. It can also be fitted as a corner or T-piece.

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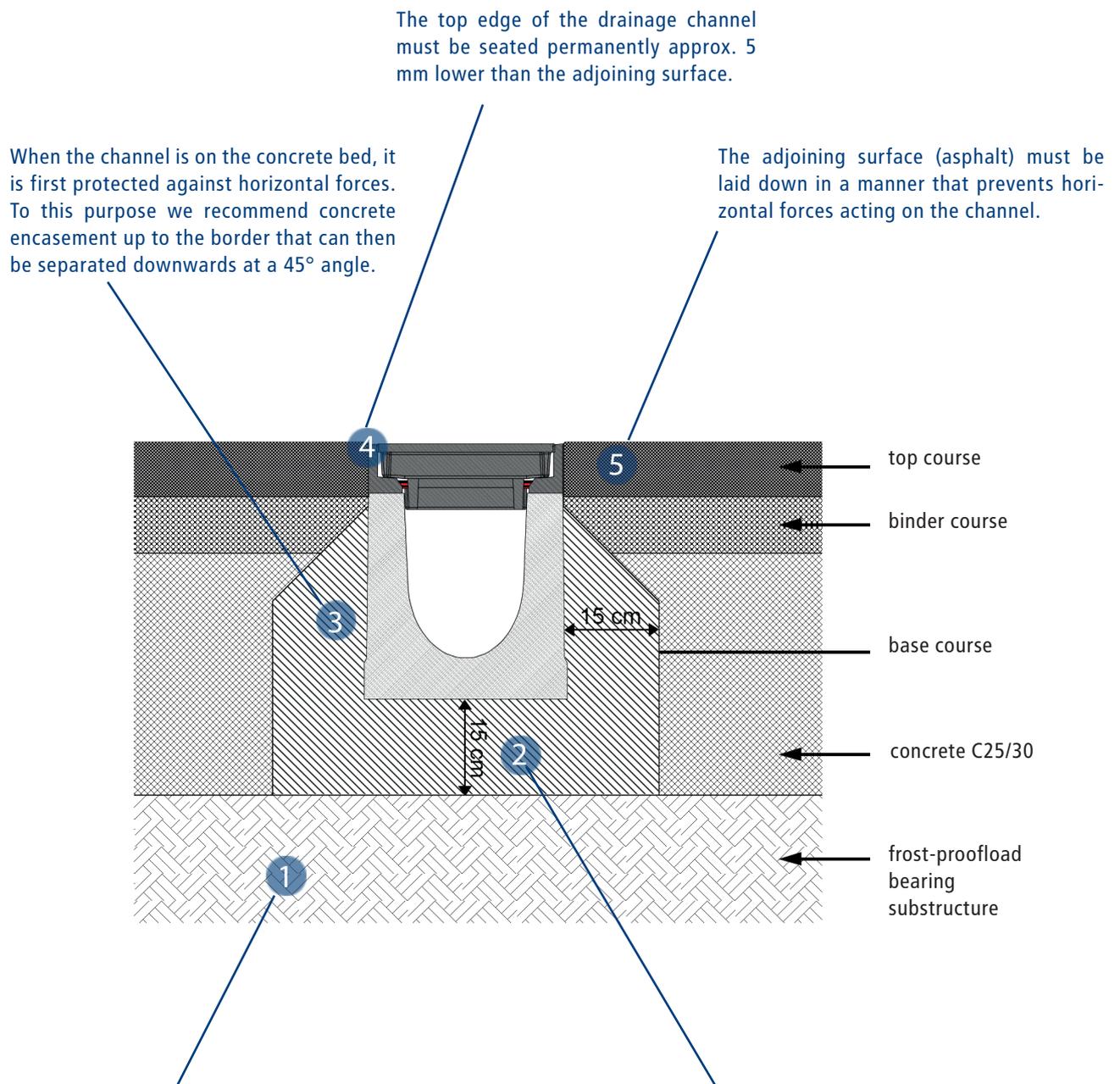
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## SYSTEM TOP 100

### Installation instructions TOP – Asphalt (class A 15 – C 250)



Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When installing the TOP system a concrete bed is laid, depending on the load class (A15/C250). When installing a channel system of class C250 we recommend laying the channel on a layer of concrete with a minimum thickness of 15 cm (C25/30). Channel systems of classes A15 – B125 require a concrete bed with a minimum thickness of 10 cm.

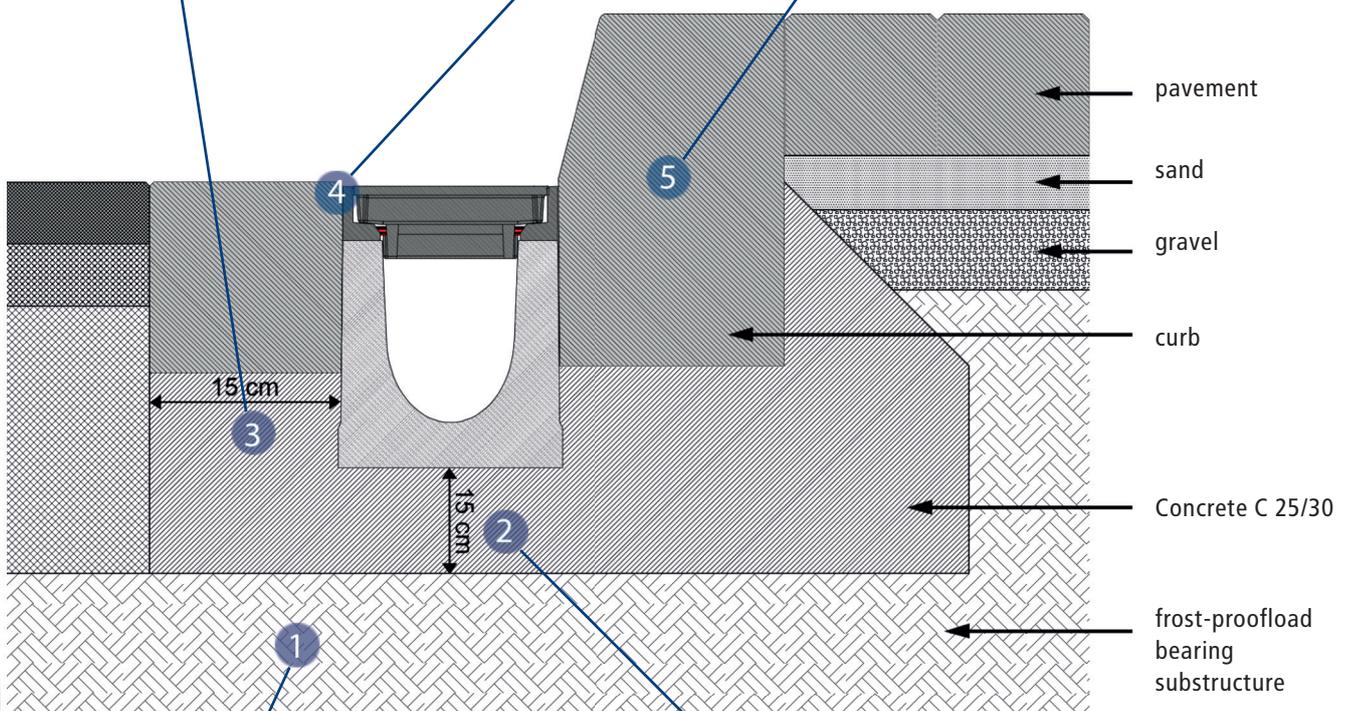
## SYSTEM TOP 100

### Installation instructions TOP – Asphalt / stretchers / curb stones (class A 15 – C 250)

The stretchers must be laid in fresh concrete and backfilled with concrete mortar. It is important that the top edge of the stretchers is seated permanently at least 3mm higher than the drainage channel.

If the channel is positioned on the concrete bed, it is first protected against horizontal forces. To this purpose concrete encasement with a width of 15 cm is necessary, while the height in this case depends on the height of the stretchers and curbs.

The curb must also be laid in fresh concrete and then backfilled with grouting mortar.



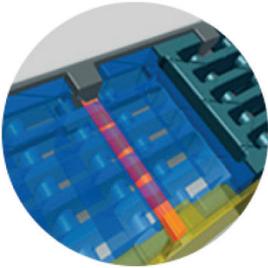
Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When the TOP system is installed, a concrete bed in compliance with load class (A15/C250) is laid down. When installing a channel system of class C250 we recommend laying the channel on a layer of concrete with a minimum thickness of 15 cm (C25/30). Channel systems of classes A15 – B 125 require a concrete bed with a minimum thickness of 10 cm.

## SYSTEM MAXI 100/150/200

### System MAXI 100/150/200

- Optimised heavy-duty channel with outstanding properties
- All drainage channel elements are supplied preassembled with matching gratings
- The "MAXI" system covers all load classes from C250 – F900
- Secure rebated joint
- Firm anchoring with longitudinal strut prevents "outgrowing" of the channel
- Connection profile for precise fit and simple connection
- Precast section at the base of each channel element for a vertical outlet drain (DN 100 / 150)
- Lengthways restraints for optimum absorption of longitudinal forces



#### Screwless locking system

The patented HYDROTEC locking system permits convenient opening of the drainage channel with the installation bar



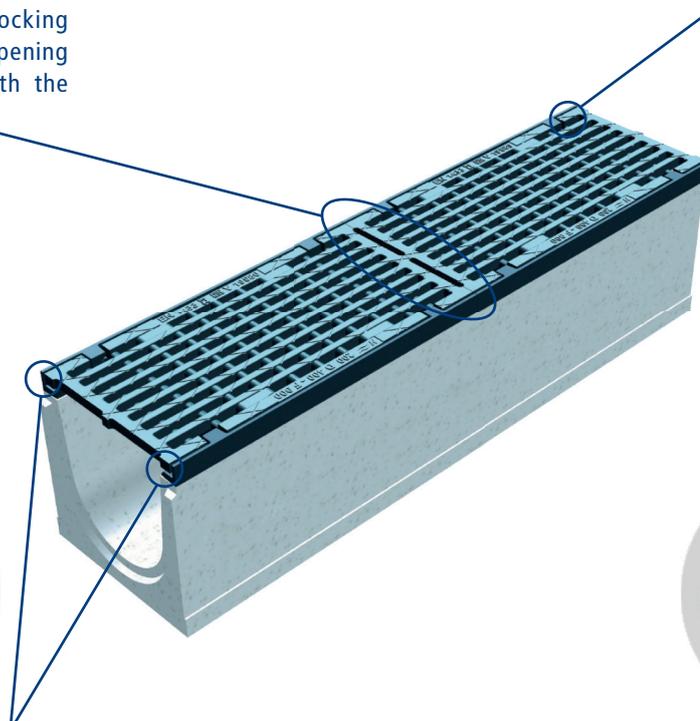
#### MAXI grating range

- Cast grating with lengthways slots
- Cast grating with crossways slots
- Cast grating (mesh)



#### Edge protection made of ductile cast iron

5mm thick edge protection made of ductile cast iron provides maximum stability in all classes (C250 – F900).



#### Special cross element

The special MAXI element permits extension of the channel run with the required branches. It can also be fitted as a corner or T-piece.

## SYSTEM MAXI F1

### System MAXI F1

- System for applications with extreme requirements for a wide range of safety aspects
- The absorption of maximum undertow and brake forces in combination with sufficient fire resistance
- Longitudinal slots prevent overflowing water and allow optimum water catchment
- Tongue and groove prefabrication for simple element connection
- Precast section for a vertical outlet drain (DN 100/150)

A multi-toothed socket wrench (15 mm) is required for securing the screws. The screws are tightened to a torque of 80 Nm. We recommend greasing the screws with synthetic grease.



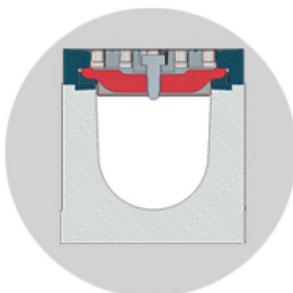
#### Sealing

The individual joint connections can be sealed with a sealant.



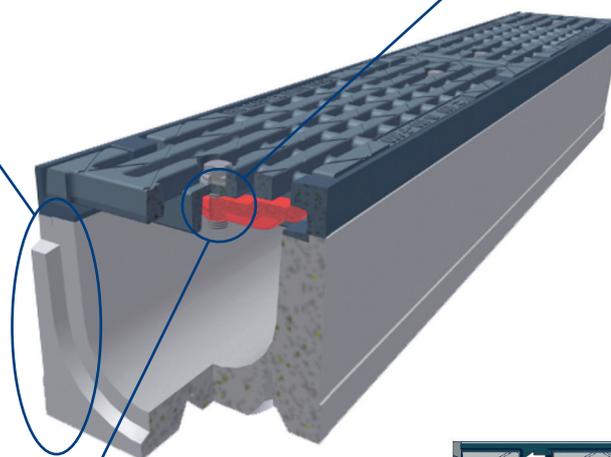
#### 4 special screws per running metre

The special screws of the MAXI F1 system ensure safe fixture with only four stainless steel screws per running metre.



#### Special screw bar

Two special screw bars per grating guarantee traffic safety in all load classes and ensure that the MAXI F1 also satisfies the highest safety requirements.

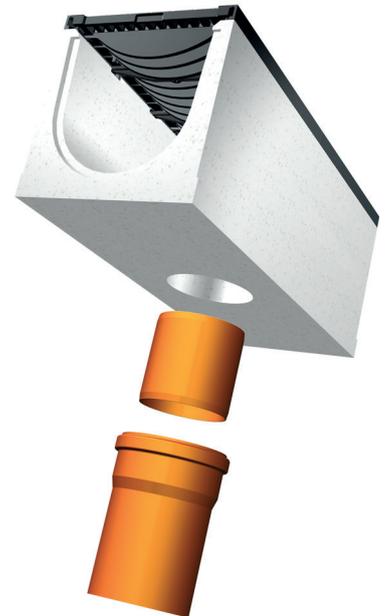
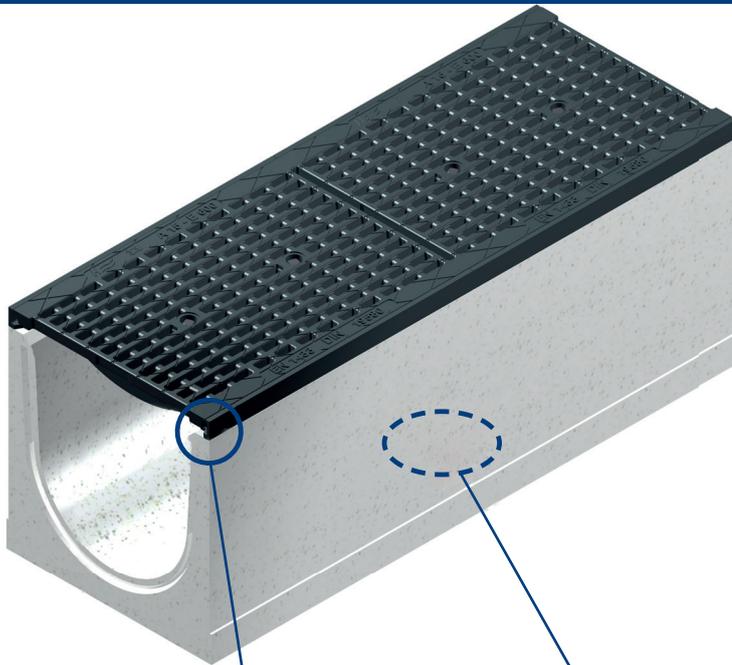


#### Longitudinal restraints

With 8 safety points per running metre, braking forces are effectively absorbed and discharged.

# SYSTEM MAXI F1 300

## System MAXI F1 300



**5mm cast border**  
5mm thick edge protection made of ductile cast iron provides maximum stability for the MAXI F1 300.

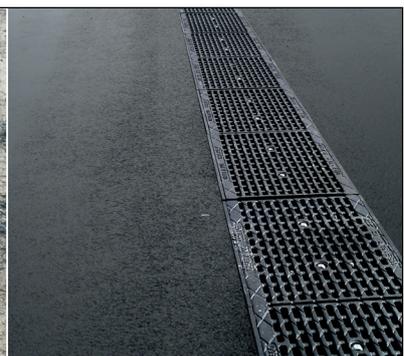


**DN 150 / DN 200 connection**  
HYDROTEC produces the MAXI F1 300 drainage channel with a connection for DN 150 or DN 200 KG pipes as required. It is only necessary to connect the pipe.

**On your marks ...**

**get set ...**

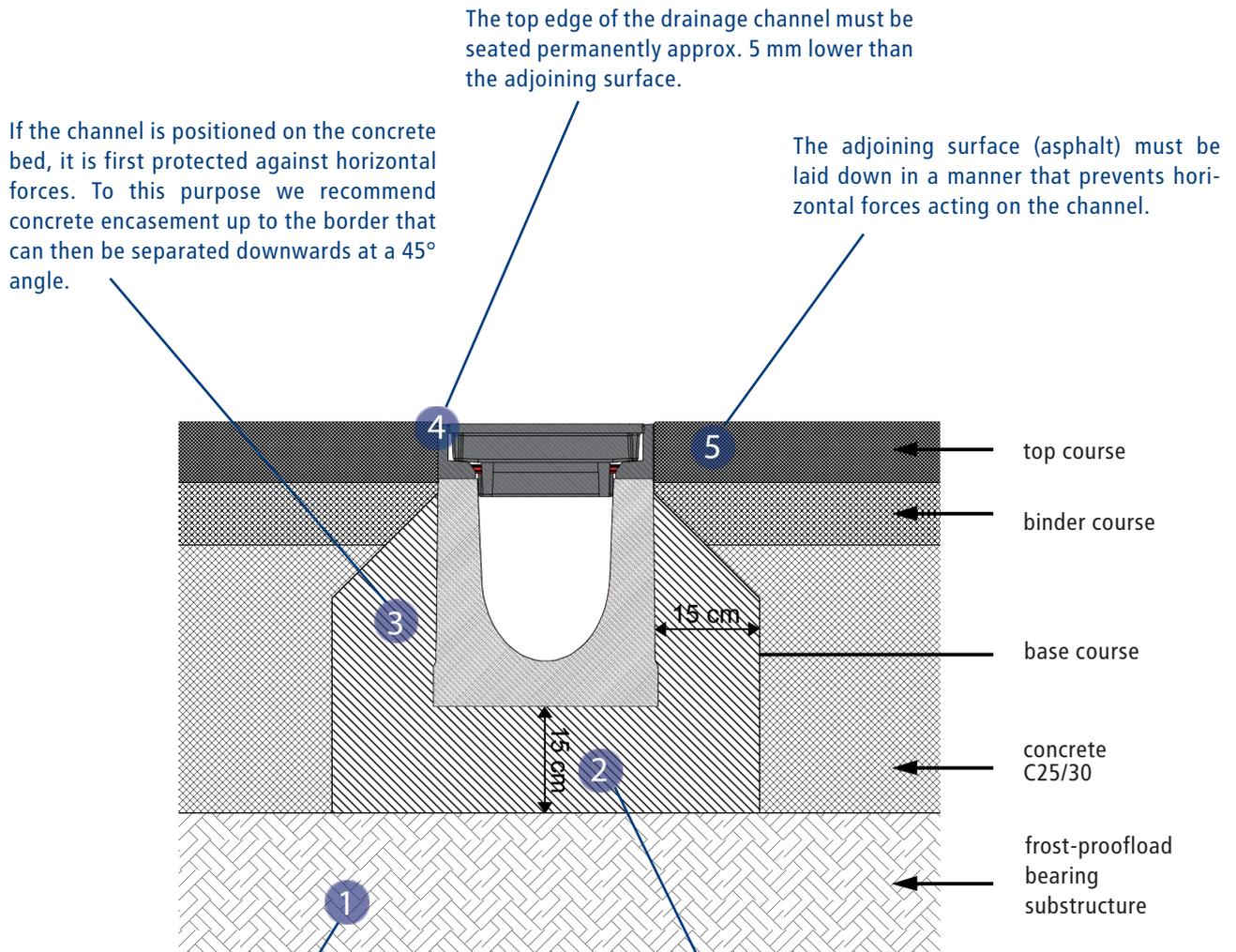
**go!**



MAXI F1 300 test track Hanover-Langenhagen

## SYSTEM MAXI

### Installation instructions MAXI – Asphalt (class A 15 – C 250)

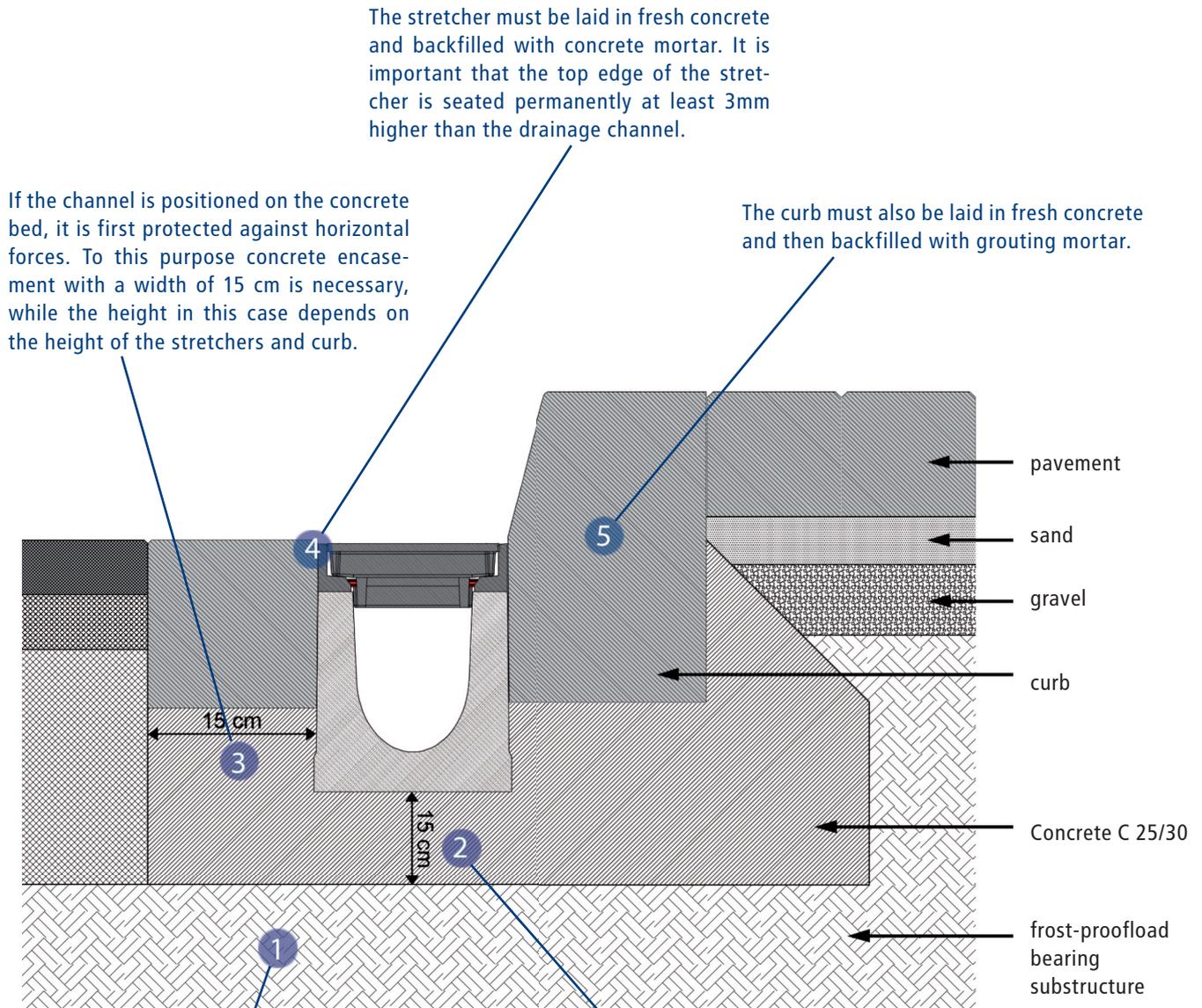


Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When installing the MAXI system a concrete bed is laid, depending on the load class (A15/C250). When installing a channel system of class C250 we recommend laying the channel on a layer of concrete with a minimum thickness of 15 cm (C25/30). Channel systems of classes A 15 – B 125 require a concrete bed with a minimum thickness of 10 cm.

## SYSTEM MAXI

### Installation instructions MAXI – Asphalt / stretchers / curb stones (class A15 – C250)



The stretcher must be laid in fresh concrete and backfilled with concrete mortar. It is important that the top edge of the stretcher is seated permanently at least 3mm higher than the drainage channel.

If the channel is positioned on the concrete bed, it is first protected against horizontal forces. To this purpose concrete encasement with a width of 15 cm is necessary, while the height in this case depends on the height of the stretchers and curb.

The curb must also be laid in fresh concrete and then backfilled with grouting mortar.

Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When installing the MAXI system a concrete bed is laid, depending on the load class (A 15/C 250). When installing a channel system of class C 250 we recommend laying the channel on a layer of concrete with a minimum thickness of 15 cm (C25/30). Channel systems of classes A 15 – B 125 require a concrete bed with a minimum thickness of 10 cm.

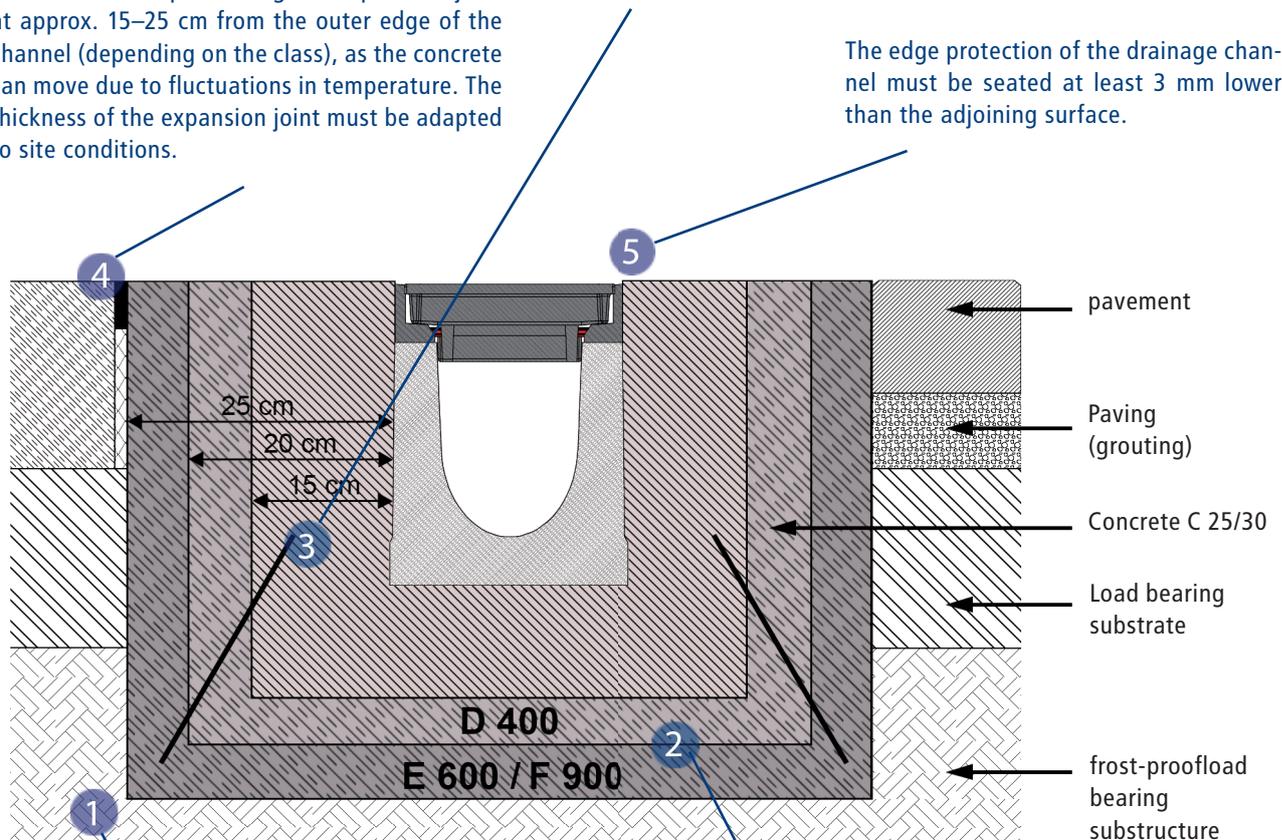
## SYSTEM MAXI

### Installation instructions MAXI – Concrete top course / plaster stones (class D 400 - F900)

We recommend positioning an expansion joint at approx. 15–25 cm from the outer edge of the channel (depending on the class), as the concrete can move due to fluctuations in temperature. The thickness of the expansion joint must be adapted to site conditions.

If the channel is positioned on the concrete bed, it is first protected against horizontal forces. To this purpose concrete encasement with a minimum width of 15 cm and a height of approx. 12 cm is necessary, depending on the channel version and load class. For sites exposed to high loads (E600/F900) we recommend additional reinforcement such as Ø8mm steel rods at intervals of 300mm.

The edge protection of the drainage channel must be seated at least 3 mm lower than the adjoining surface.



Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When installing the MAXI system a concrete bed is laid, depending on the load class (D400 – F900). When a class D400 channel system is installed, the channel must be laid on a layer of concrete with a minimum thickness of 20 cm (C25/30). Channel systems of classes E600 – F900 require a concrete bed with a minimum thickness of 25 cm. At sites which are exposed to high loads (E600/F900) we recommend additional reinforcement of the concrete encasement.

## SYSTEM HYDROblock 100 / 200 / 300

### System HYDROblock 100/200/300

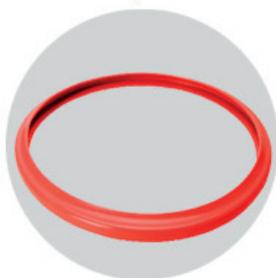
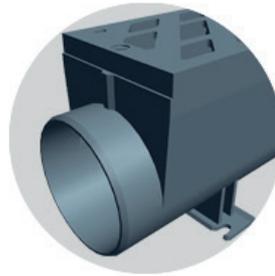
- Patented drainage system type I
- Innovative, sustainable sealing system for simple handling
- Minimum planning and installation requirements
- Low maintenance and rattle-free
- Protection against theft and vandalism
- Monolithic design made of ductile cast iron
- Marking of the direction of flow on every channel element

#### Reliable sealing

The spigot end permits connection of commercially available plastic pipes.

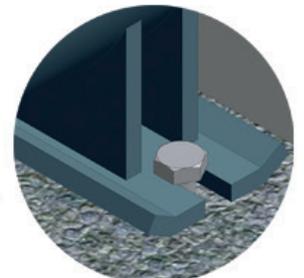
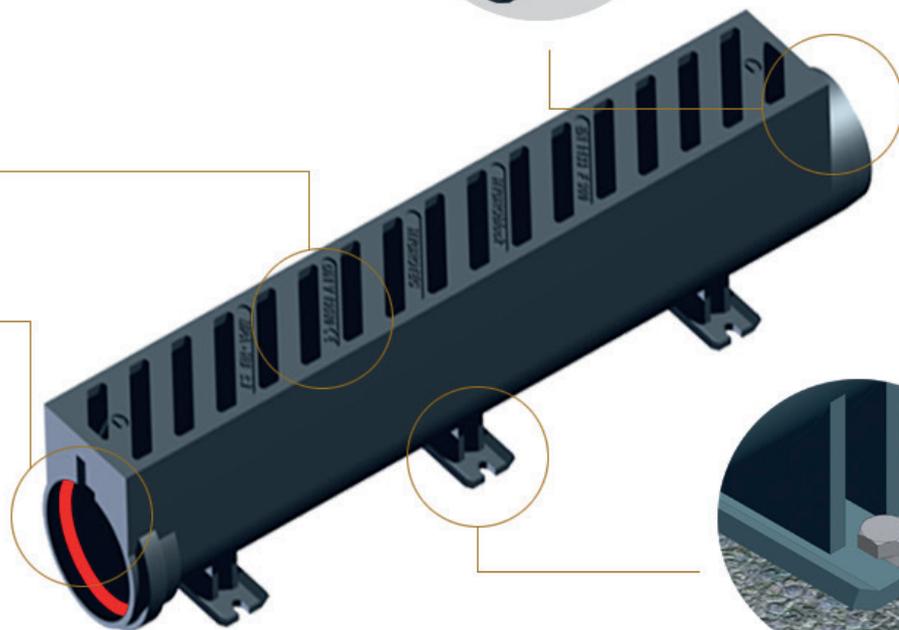


**Security slot system**  
With the monolithic construction of ductile cast iron the security slot system is suitable for longitudinal and crosswise traffic loads.



#### Revolutionary spigot seal

The HYDROblock system has a revolutionary connection and permits simple and tight installation due to the integrated spigot seal.



#### Anchoring

The bases can also be anchored in the foundation that provide a very strong connection that withstands all load classes (F900).

Supplied By:

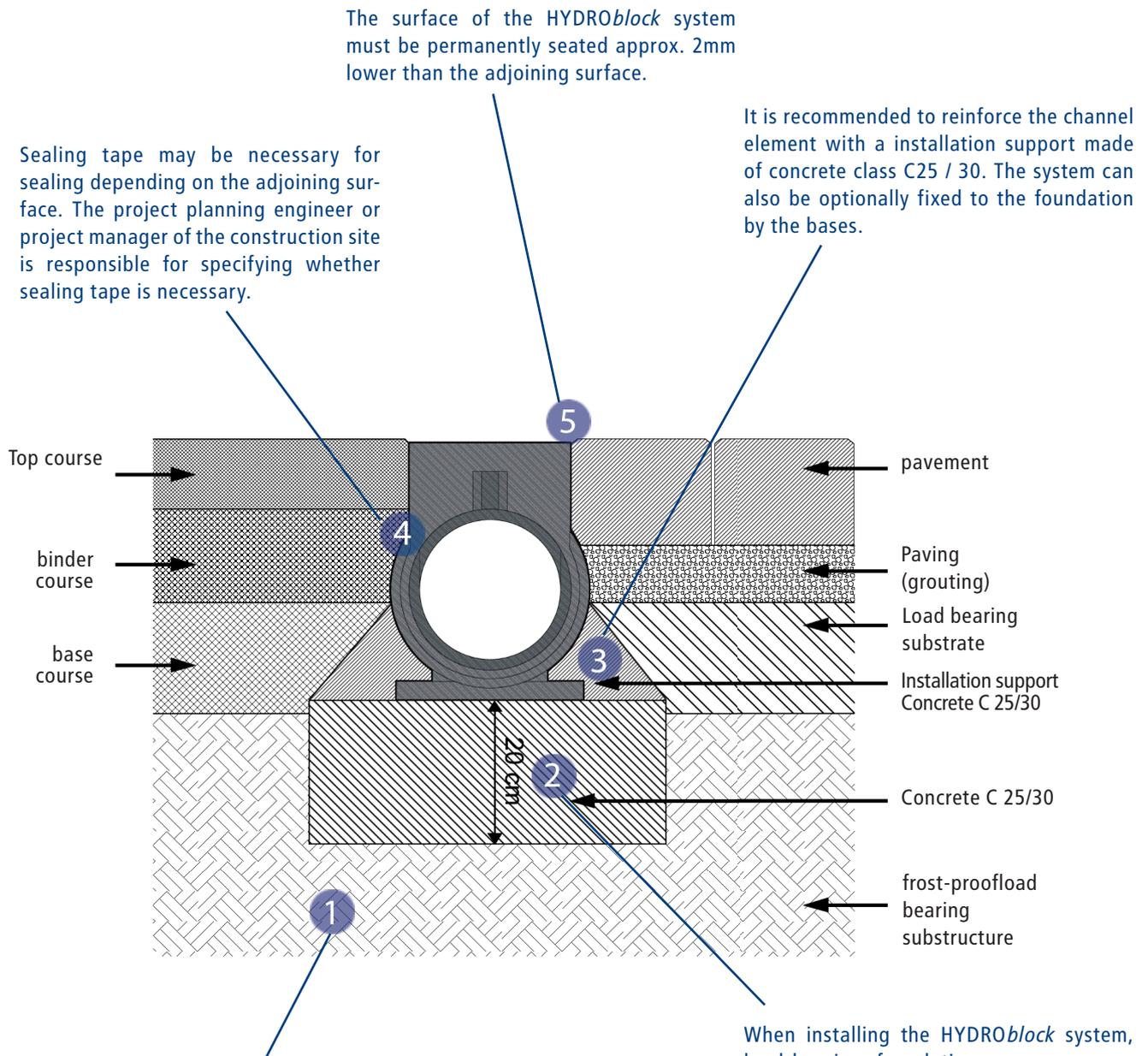
**TRENCHDRAIN  
SUPPLY**

877-903-7246

[www.trenchdrainsupply.com](http://www.trenchdrainsupply.com)

## SYSTEM HYDROblock 100 / 200 / 300

### Installation instructions HYDROblock – Asphalt (class F900)



Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When installing the HYDROblock system, load-bearing foundations are necessary with a minimum height of 20 cm. The exact dimensions must be adapted to the structural conditions of the respective construction project.

Furthermore we recommend sealing between the individual elements with a joint sealant!



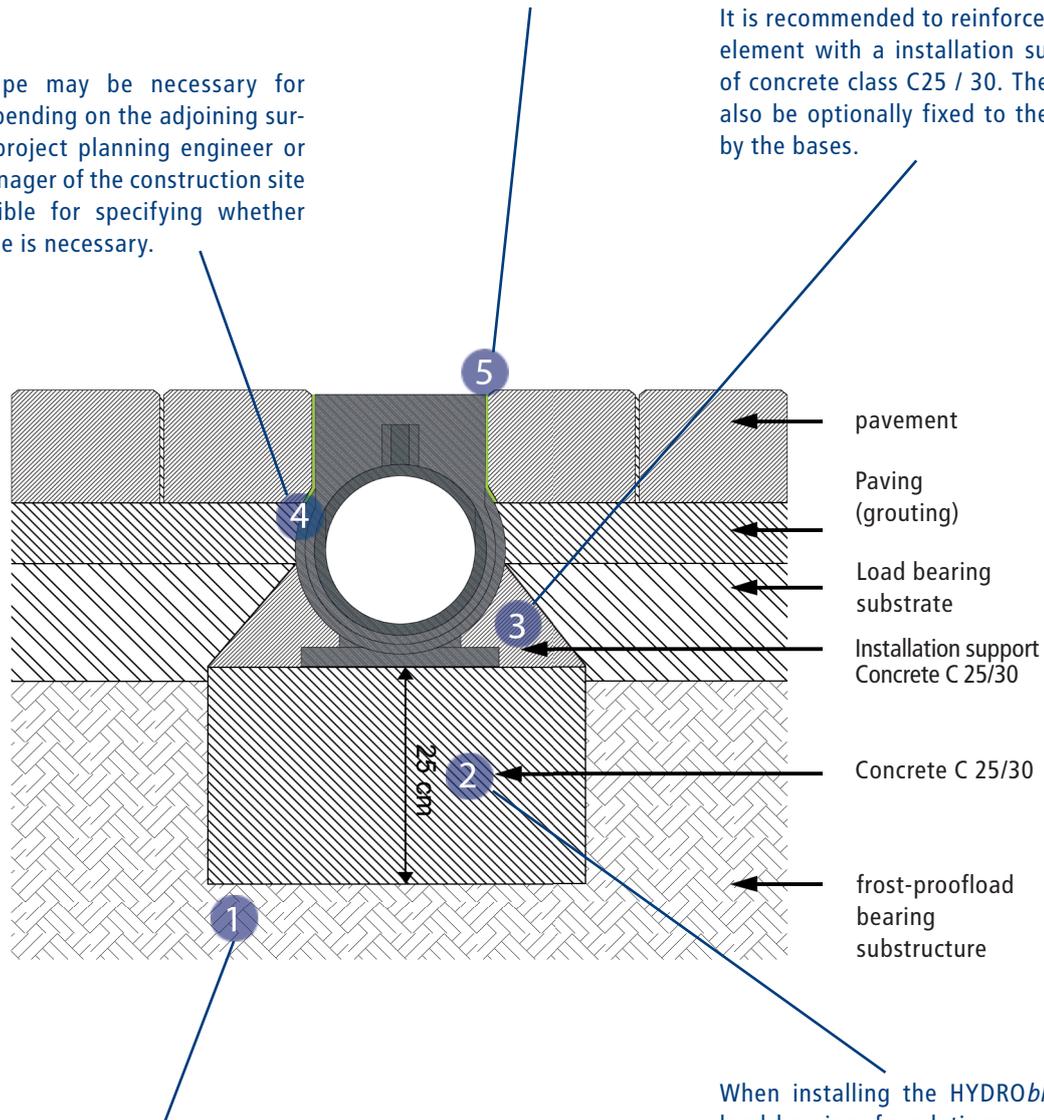
## SYSTEM HYDROblock 100 / 200 / 300

### Installation instructions HYDROblock – Asphalt (class F900)

The surface of the HYDROblock system must be permanently seated approx. 2mm lower than the adjoining surface.

Sealing tape may be necessary for sealing depending on the adjoining surface. The project planning engineer or project manager of the construction site is responsible for specifying whether sealing tape is necessary.

It is recommended to reinforce the channel element with an installation support made of concrete class C25 / 30. The system can also be optionally fixed to the foundation by the bases.



Before starting installation, ensure that the substructure is frost-proof and has a sufficient bearing capacity. The substructure must therefore be compressed correctly (depending on the load class) to prevent "sinking" of the channel run. This is generally specified by the project structural or planning engineer.

When installing the HYDROblock system, load-bearing foundations are necessary with a minimum height of 20 cm. The exact dimensions must be adapted to the structural conditions of the respective construction project.

Furthermore we recommend sealing between the individual elements with a joint sealant!



## SYSTEM HYDROblock 100 / 200 / 300

### Laying instructions, HYDROblock



The concrete bed is laid in accordance with the necessary load class to install the HYDROblock.



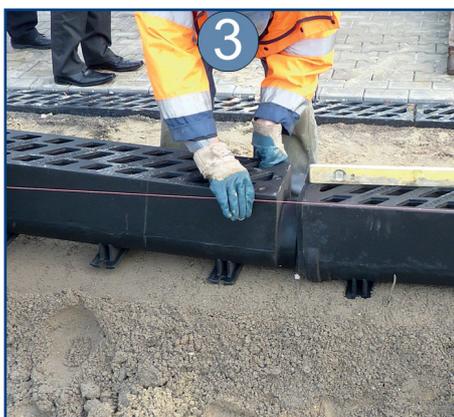
The HYDROblock laying tool is then used to pull the elements together.



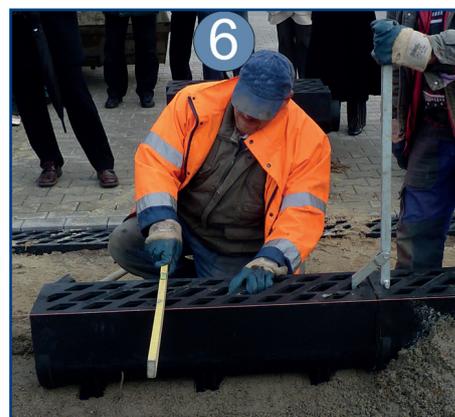
Before the elements can be joined, apply a lubricant to the spigot.



After connection the element is set at the correct height.



The elements are then connected with the joint and spigot connection.



Finally it is checked whether the element is horizontal.

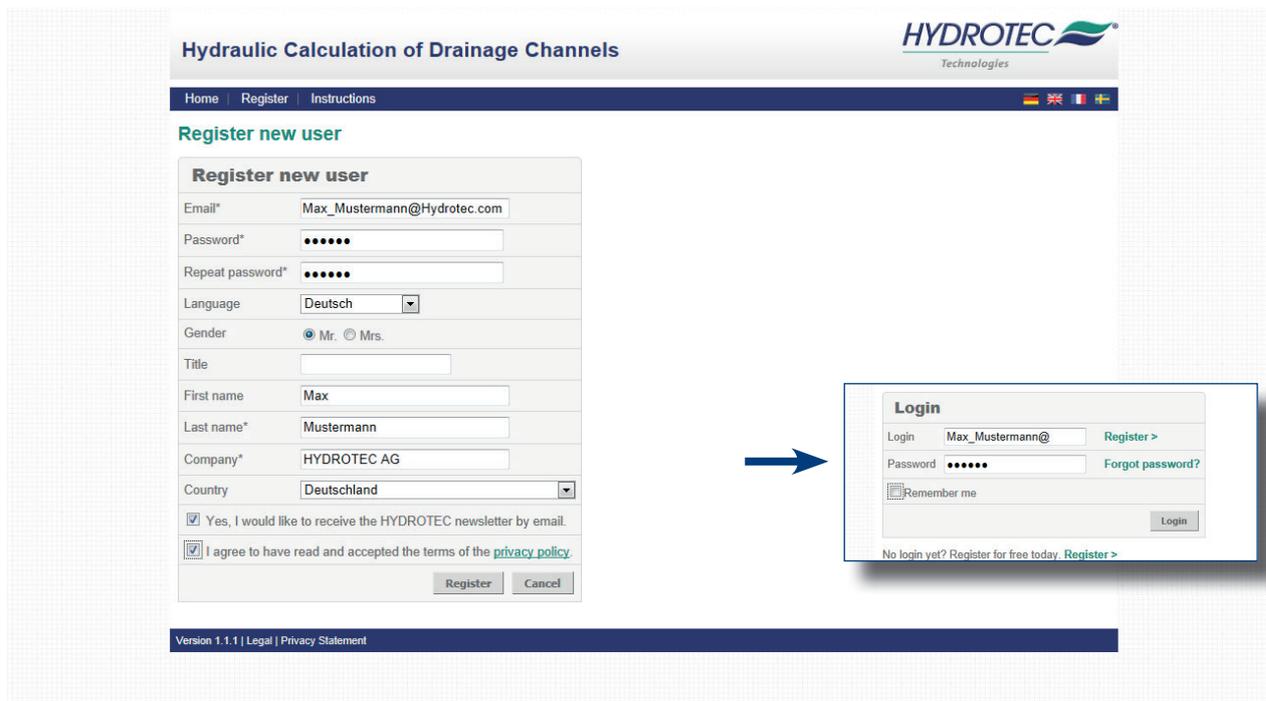
# HYDRAULIC CALCULATOR

## Information and use

The HYDROTEC hydraulic calculator enables you to calculate your material requirements for your construction project yourself. It will provide end-to-end information that you need to determine the optimum channel elements and accessories to suit your requirements. The HYDROTEC technical support team will be pleased to help you obtain the required data.

The individual steps to determine your material requirements are given below.

### Step 1: Registration / Log-in



**Hydraulic Calculation of Drainage Channels**

Home | Register | Instructions

**Register new user**

**Register new user**

Email\* Max\_Mustermann@Hydrotec.com

Password\* ●●●●●

Repeat password\* ●●●●●

Language Deutsch

Gender  Mr.  Mrs.

Title

First name Max

Last name\* Mustermann

Company\* HYDROTEC AG

Country Deutschland

Yes, I would like to receive the HYDROTEC newsletter by email.

I agree to have read and accepted the terms of the [privacy policy](#).

Register Cancel

**Login**

Login Max\_Mustermann@ Register >

Password ●●●●● Forgot password?

Remember me

Login

No login yet? Register for free today. Register >

Version 1.1.1 | Legal | Privacy Statement

Register by filling out the form. You can also register for the optional HYDROTEC newsletter. In future you will only need your e-mail address and your password.

PS: Your data will only be used to evaluate the response to the hydraulic calculator. These data are deleted after statistical analysis!

# HYDRAULIC CALCULATOR

## Information and use

### Step 2: Enter your construction project details

#### Project

Project > Lines > Parameters > Channel > Line length > Sewer connection > Bill of Material

<p><b>Projects</b></p> <p><a href="#">Antreiteplatz</a> 08.03.2013   PDF</p> <p><a href="#">Schweden</a> 26.02.2013   PDF</p>	<p><b>Edit project</b></p> <p>Project <input type="text" value="Airport"/></p> <p style="text-align: right;"> <input type="button" value="Delete"/> <input type="button" value="Continue &gt;"/> </p>
---	---

Enter the name of your planned construction project in the empty box and click "Continue" to go to step 3.

### Step 3: Enter the required channel runs

#### Lines

Project > Lines > Parameters > Channel > Line length > Sewer connection > Bill of Material

<p><b>Projects</b></p> <p><a href="#">Antreiteplatz</a> 08.03.2013   PDF</p> <p><a href="#">Schweden</a> 26.02.2013   PDF</p> <p><a href="#">Airport</a></p>	<p><b>Airport: Edit line</b></p> <table border="1"> <thead> <tr> <th>No.</th> <th>Channel line</th> <th>Edit</th> <th>PDF</th> <th>Delete</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Gate A</td> <td><a href="#">Continue &gt;</a></td> <td><a href="#">PDF</a></td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p> <input type="button" value="Add line"/> <input type="button" value="Submit"/> </p>	No.	Channel line	Edit	PDF	Delete	1	Gate A	<a href="#">Continue &gt;</a>	<a href="#">PDF</a>	<input type="checkbox"/>
No.	Channel line	Edit	PDF	Delete							
1	Gate A	<a href="#">Continue &gt;</a>	<a href="#">PDF</a>	<input type="checkbox"/>							

Now enter a name for the respective run that you need for your construction project. Then click "Save". "Next" then appears. Click "Next" to continue to the next stage in the channel run calculation. You can naturally process several runs in succession with "Add run".

### Step 4: Select the required properties

#### Parameters

Project > Lines > Parameters > Channel > Line length > Sewer connection > Bill of Material

<p><b>Projects</b></p> <p><a href="#">Antreiteplatz</a> 08.03.2013</p> <p><a href="#">Schweden</a> 26.02.2013</p> <p><a href="#">Airport</a> 06.02.2013</p> <p>2 of 2</p>	<p><b>Edit line</b></p> <p>Channel line 1 - Gate A</p> <p>Load class <input type="text" value="F 900"/> ⓘ</p> <p>Calculation mode <input type="text" value="Intensity of rainfall"/> ⓘ</p> <p>Intensity of rainfall <input type="text" value="120"/> l/(s*ha)</p> <p>Catchment depth E <input type="text" value="30"/> m ⓘ</p> <p>Total channel line length L <input type="text" value="200"/> m ⓘ</p> <p>Surface material <input type="text" value="Impermeable"/></p> <p> <input type="button" value="Continue &gt;"/> </p>	<p>Recommendations for your area</p> <table border="1"> <thead> <tr> <th>Ort</th> <th>Regenspende <math>r_{15(0)}</math> l/(s*ha)</th> </tr> </thead> <tbody> <tr><td>Bonn</td><td>109</td></tr> <tr><td>Essen</td><td>97</td></tr> <tr><td>Flensburg</td><td>101</td></tr> <tr><td>Frankfurt/Main</td><td>120</td></tr> <tr><td>Hamburg</td><td>100</td></tr> <tr><td>Hannover</td><td>101</td></tr> <tr><td>Konstanz</td><td>151</td></tr> <tr><td>München</td><td>135</td></tr> <tr><td>Stuttgart</td><td>125,7</td></tr> <tr><td>Tübingen</td><td>201</td></tr> <tr><td>Ulm</td><td>141</td></tr> </tbody> </table>	Ort	Regenspende $r_{15(0)}$ l/(s*ha)	Bonn	109	Essen	97	Flensburg	101	Frankfurt/Main	120	Hamburg	100	Hannover	101	Konstanz	151	München	135	Stuttgart	125,7	Tübingen	201	Ulm	141
Ort	Regenspende $r_{15(0)}$ l/(s*ha)																									
Bonn	109																									
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Flensburg	101																									
Frankfurt/Main	120																									
Hamburg	100																									
Hannover	101																									
Konstanz	151																									
München	135																									
Stuttgart	125,7																									
Tübingen	201																									
Ulm	141																									

You can now choose which conditions your channel run has to fulfil. During selection you are assisted with our information circles when you point at them with the mouse. The rainfall refers to statistical values that mainly have to be specified by the client. When you have selected all values in accordance with your requirements, click "Next" to go to Step 5.

# HYDRAULIC CALCULATOR

## Information and use

### Step 5: Specifying the channel type

#### Channel

Project > Lines > Parameters > Channel > Line length > Sewer connection > Bill of Material

**Projects**

[Antreplatz](#)  
08.03.2013

[Schweden](#)  
26.02.2013

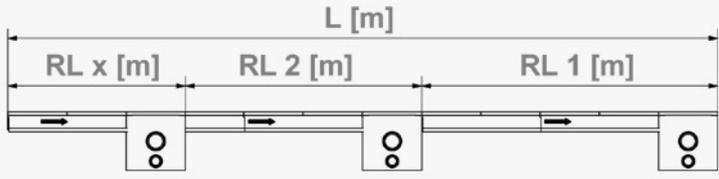
[Airport](#)  
06.02.2013

2 of 2

**Select channel cross-section: 1 - Gate A**

Load class: F 900, Intensity of rainfall: 120 l/(s\*ha), Catchment depth E: 30.00 m, Total channel line length L: 200.00 m

Select the maximum channel line length below (distance between two sewer types).  
Recommended: max. section length 35 m, max. value 50 m.



< Back

Max. channel length RL					
Type	DN	Height	Discharge	max. channel line RL	Select
MAXI/TOP	100	160 mm	2.66 l/s	7.0 m	Select >
HYDROblock	100	180 mm	3.12 l/s	8.5 m	Select >
MAXI/TOP	100	185 mm	3.96 l/s	11.0 m	Select >
MAXI/TOP	100	210 mm	5.41 l/s	15.0 m	Select >
MAXI/TOP	150	210 mm	5.63 l/s	15.5 m	Select >
MAXI/TOP	100	235 mm	7.02 l/s	19.5 m	Select >
MAXI/TOP	100	260 mm	8.75 l/s	24.0 m	Select >
MAXI/TOP	150	260 mm	10.15 l/s	28.0 m	Select >
MAXI/TOP	150	310 mm	15.49 l/s	43.0 m	Select >
HYDROblock	200	295 mm	17.65 l/s	49.0 m	Current Selection >

All suitable channels are then displayed on the basis of the data you have entered. You can now choose the respective channel type by clicking "Select". You will then be taken to the next step.

# HYDRAULIC CALCULATOR

## Information and use

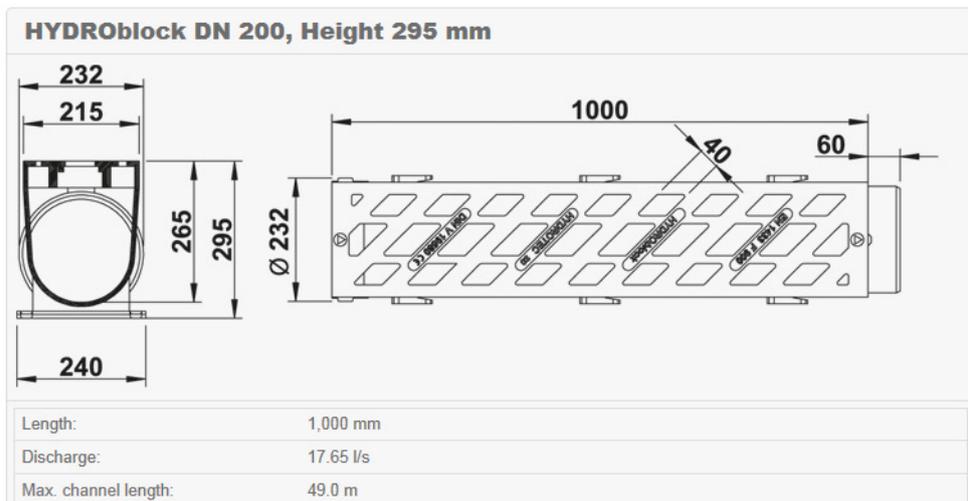
### Step 6: Specifying the channel run length

#### Line length

Project > Lines > Parameters > Channel > **Line length** > Sewer connection > Bill of Material

Projects	Selected channel: 1 - Gate A
<a href="#">Antreteplatz</a> 08.03.2013 <a href="#">Schweden</a> 26.02.2013 <a href="#">Airport</a> 06.02.2013 K < 2 of 2	Load class: F 900, Intensity of rainfall: 120 l/(s*ha), Catchment depth E: 30.00 m, Total channel line length L: 200.00 m Distribution of sewer connections align to grid ⓘ Selected channel line length 35.00 m ≤ 49.00 m < Back <span style="float: right;">Continue &gt;</span>

**HYDROblock DN 200, Height 295 mm**



Length:	1,000 mm
Discharge:	17.65 l/s
Max. channel length:	49.0 m

You can then enter the required length of the channel run, whereby these should naturally not exceed the maximum channel run length of the selected channel type. You can also select how the drainage connections should be distributed. The blue information circle is of assistance in this case.

### Step 7: Connection options

#### Sewer connection

Project > Lines > Parameters > Channel > Line length > **Sewer connection** > Bill of Material

Projects	Sewer connection: 1 - Gate A
<a href="#">Antreteplatz</a> 08.03.2013 <a href="#">Schweden</a> 26.02.2013 <a href="#">Airport</a> 06.02.2013 K < 2 of 2	Load class: F 900, Intensity of rainfall: 120 l/(s*ha), Catchment depth E: 30.00 m, Total channel line length L: 200.00 m, Selected channel line length : 35.0 m Sewer/Pipe connection: <input type="text" value="Feed box"/> ⓘ < Back <span style="float: right;">Continue &gt;</span>

**HYDROblock DN 200, Height 295 mm**



Select the type of connection from three alternatives and confirm your choice by clicking "Continue" to proceed to the last step.

# HYDRAULIC CALCULATOR

## Information and use

### Step 8: Result

#### Bill of Material

Project > Lines > Parameters > Channel > Line length > Sewer connection > **Bill of Material**

**Projects**

[Antreplatz](#)  
08.03.2013

[Schweden](#)  
26.02.2013

[Airport](#)  
06.02.2013

K < 2 of 2

**1 - Gate A**

Load class: F 900, Intensity of rainfall: 120 l/(s\*ha), Catchment depth E: 30.00 m, Total channel line length L: 200.00 m (200.0 m), Selected channel line length : 35.0 m, Feed box, align to grid

5x 34.5 m (34 m + 0.5 m) = 172.5 m



1x 27.5 m (27 m + 0.5 m) = 27.5 m



[< Back](#)
[Show PDF](#)
[Add line](#)

Questions? Please contact our team: +49 4331 93550 or [rinne@hydrotec.com](mailto:rinne@hydrotec.com)  
Search all HYDROTEC products at our [productfinder >>](#)

Bill of material						
Quantity	Type	DN	Height	Length	Productcode	Product selector
197	HYDROblock	200	295 mm	1000 mm	... 050	<a href="#">Product selector &gt;</a>
6	Feed box HYDROblock	200	500 mm	500 mm	... 008	<a href="#">Product selector &gt;</a>

The parts list will then contain all elements (in accordance with your entered data) that you require for installation of your channel run. The product is displayed directly in our product finder when the article number is clicked. You will then be given a detailed list of all properties of the respective product.

Our technical support team would be pleased to advise you during calculation or to answer your questions regarding the drainage capacity of the HYDROTEC drainage channels: **Phone: +49 (0) 4431 / 93550 or e-mail: [rinne@hydrotec.com](mailto:rinne@hydrotec.com)**

## HYDRAULIC CALCULATOR

### Information and use

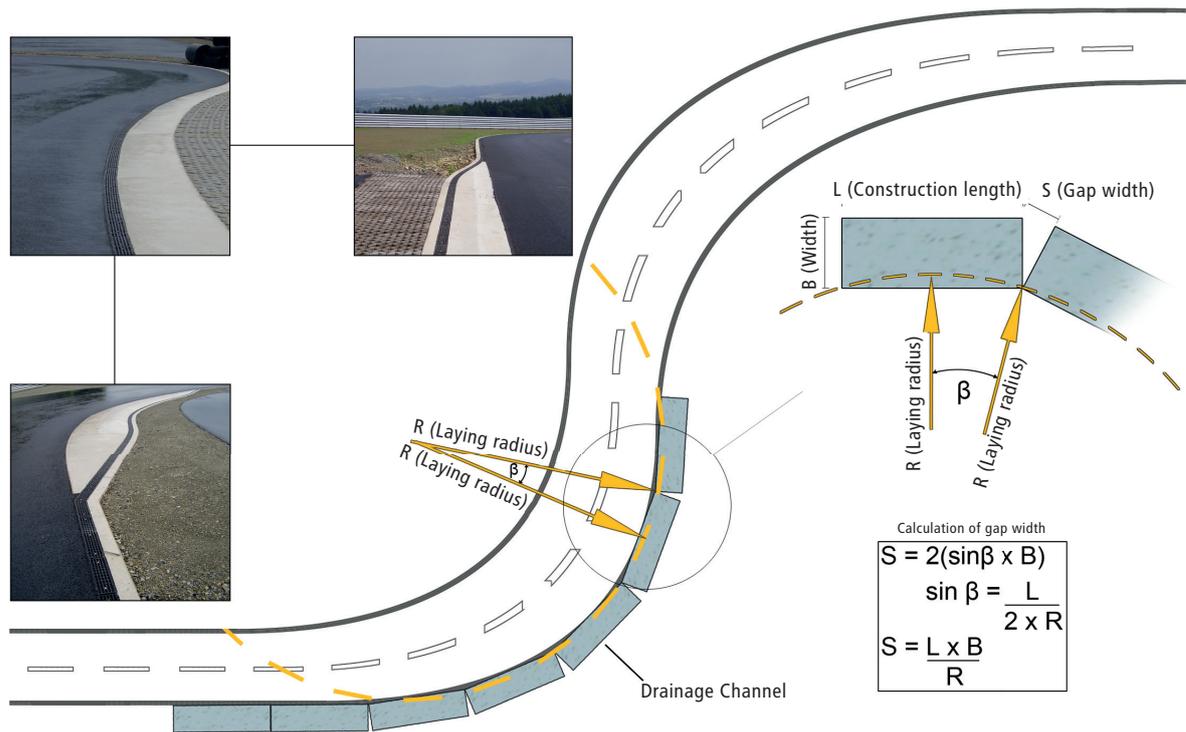
#### Drainage capacity of the HYDROTEC drainage channels

						$Q = \mu A \cdot v (2 \cdot g \cdot \Delta h)$
<b>MINI A</b>	<b>100</b>	120	80	69	0,8	<b>2,19</b>
<b>MINI B</b>	<b>100</b>	120	60	49	0,8	<b>1,34</b>
<b>TOP / MAXI</b>	<b>100</b>	160	90	79	0,8	<b>2,66</b>
	<b>100</b>	185	115	104	0,8	<b>3,95</b>
	<b>100</b>	210	140	129	0,8	<b>5,41</b>
	<b>100</b>	235	165	154	0,8	<b>7,01</b>
	<b>100</b>	260	190	179	0,8	<b>8,74</b>
<b>MAXI</b>	<b>150</b>	210	115	148	0,8	<b>5,62</b>
	<b>150</b>	235	140	186	0,8	<b>7,80</b>
	<b>150</b>	260	165	223	0,8	<b>10,15</b>
	<b>150</b>	310	215	298	0,8	<b>15,48</b>
<b>MAXI</b>	<b>200</b>	310	205	367	0,8	<b>18,62</b>
<b>MAXI F1</b>	<b>300</b>	400	300	802	0,8	<b>49,22</b>
<b>HYDROblock</b>	<b>100</b>	100	100	78	0,9	<b>3,11</b>
<b>HYDROblock</b>	<b>200</b>	200	200	313	0,9	<b>17,65</b>
<b>HYDROblock</b>	<b>300</b>	300	300	700	0,9	<b>48,33</b>

## ADDITIONAL INFORMATION

### Laying a radial arrangement

When laying HYDROTEC drainage channels you do not have to plan a linear arrangement. It is possible to lay the channels in a radial arrangement.



Radial installation R [m]	Length L [mm]								Gap width S [mm]
	Nominal width 100		Nominal width 150		Nominal width 200		Nominal width 300		
	500	1000	500	1000	500	1000	500	1000	
5,0	14,0	28,0	21,4	42,8	26,4	52,8	38,8	77,6	
7,5	9,3	18,7	14,3	28,5	17,6	35,2	25,9	51,7	
10,0	7,0	14,0	10,7	21,4	13,2	26,4	19,4	38,8	
15,0	4,7	9,3	7,1	14,3	8,8	17,6	12,9	25,9	
20,0	3,5	7,0	5,4	10,7	6,6	13,2	9,7	19,4	
25,0	2,8	5,6	4,3	8,6	5,3	10,6	7,8	15,5	
30,0	2,3	4,7	3,6	7,1	4,4	8,8	6,5	12,9	
35,0	2,0	4,0	3,1	6,1	3,8	7,5	5,5	11,1	

Gap dimension exceeded
  Max. permiss.
  Optimal

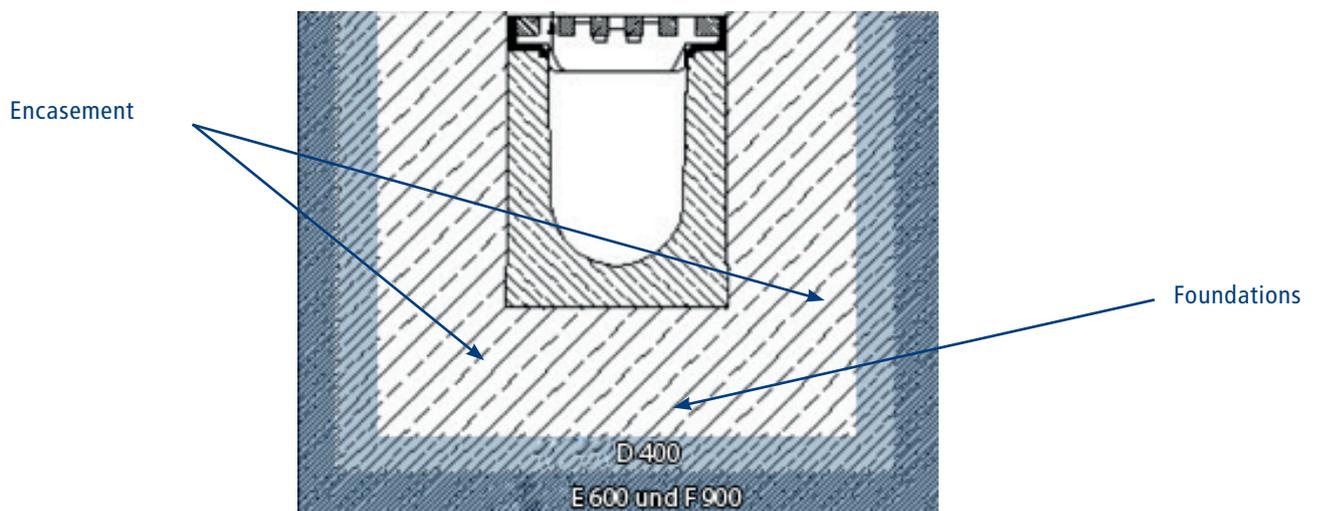
## ADDITIONAL INFORMATION

### Drainage Channel Type M

According to DIN EN 1433 drainage channels are classified in two types, type "M" and "I".

A drainage channel type M requires a foundation and encasement of concrete that can discharge occurring vertical and horizontal loads into the foundation after installation.

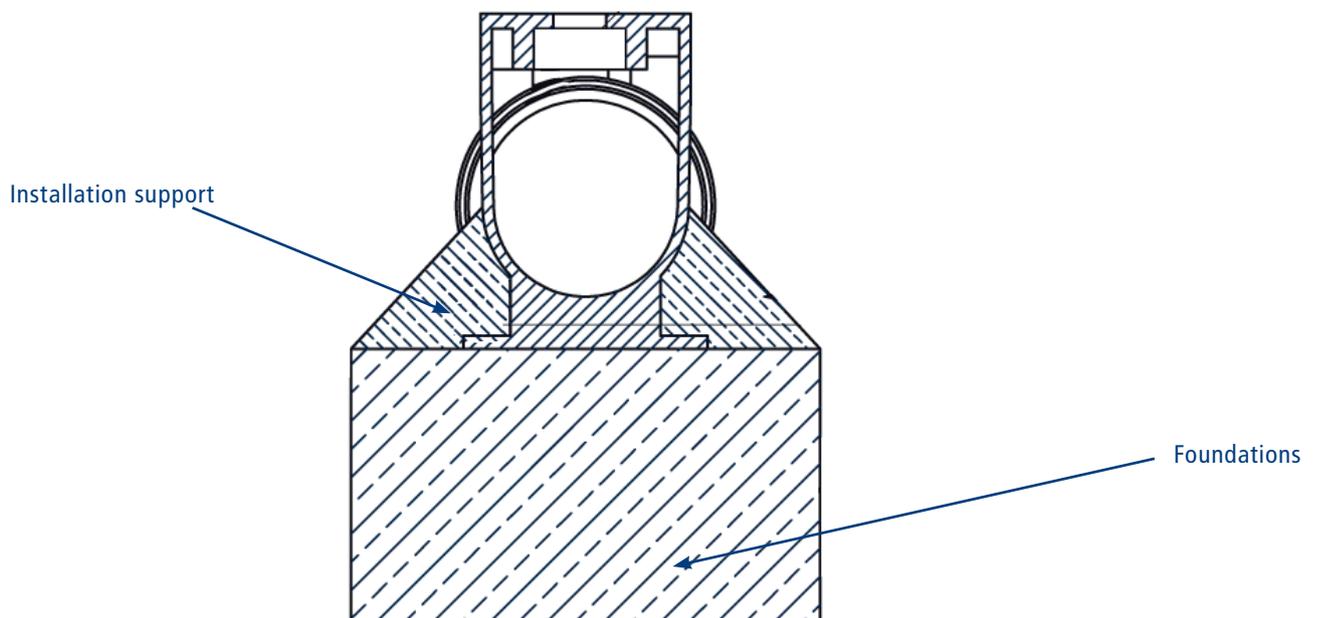
The HYDROTEC drainage systems type MINI / TOP / MAXI are installed according to DIN EN 1433 with such foundations or encasement. Detailed information on installation of type M is given in our installation instructions.



### Drainage Channel Type I

A drainage channel type I does not require a concrete encasement for bearing the loads. Foundations are only required to discharge the exerted vertical and horizontal forces.

The HYDROblock drainage system is installed in compliance with DIN EN 1433 type I and does not require concrete encasement. Detailed information on installation of type I is given in our installation instructions.



## ADDITIONAL INFORMATION

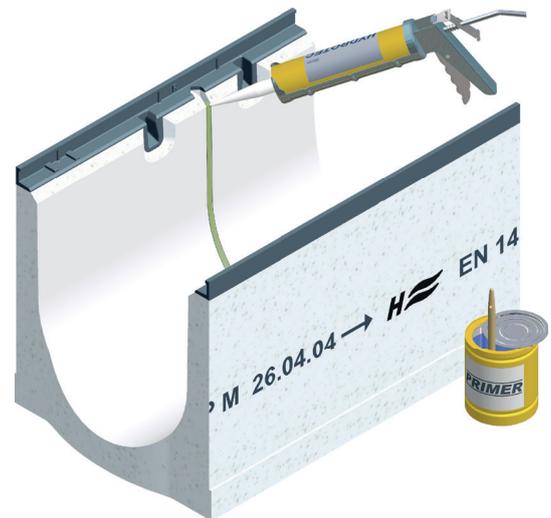
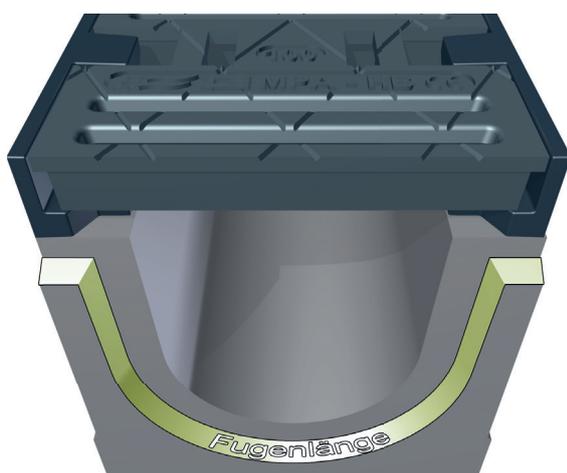
### Joint sealing

We recommend the use of joint sealant for sealing the HYDROTEC drainage systems. For example, you require the following materials for effective sealing:

e.g. Sika Primer 3 (bonding emulsion) (1 litre/container) corresponds to approximately 100 joints for MAXI 100  
e.g. Sikaflex PRO3 WF (sealant) (310 ml/container) corresponds to approx. 10 joints for MAXI 100

Before sealing the joints the connection surfaces (tongue and groove) must be thoroughly cleaned. The surfaces must be free from dust and loose particles. The bonding emulsion (Sika Primer 3) can then be applied to create a basis for the use of the sealant (Sikaflex PRO3 WF).

You can determine your sealant requirements with the table. Please note that you will require 100 ml of sealant to achieve a joint seal of approx. 100 cm.



Joint length of a MAXI / TOP drainage channel [cm]				
Type	MAXI 100/TOP 100	MAXI 150	MAXI 200	MAXI 300
000	27	40		
050	32	50	61	81
100	37	60	-	-
150	42	-		
200	47	-		
011	27	40		
021	28	42		
031	29	44		
041	30	46		
051	31	48		
061	32	50		
071	33	52		
081	34	54		
091	35	56		
101	36	58		

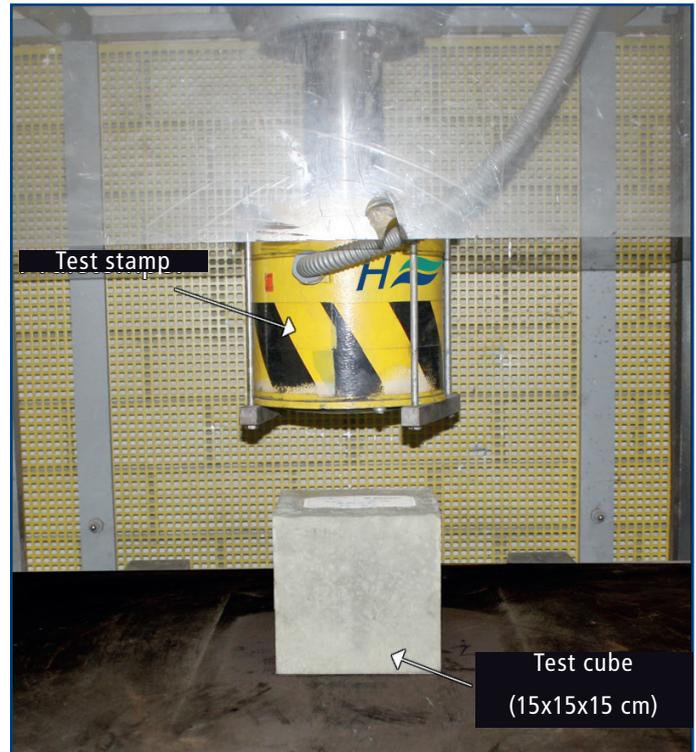
## ADDITIONAL INFORMATION

### Concrete properties to DIN EN 206

Concrete is classified in different categories and varies with regard to its resistance to pressure. The quality of the concrete is analysed 28 days after production in the form of cubes with an edge length of 15cm or cylinders with a diameter of 15cm. The results of these tests provide the values required to determine the pressure resistance.

HYDROTEC drainage systems have a pressure resistance of class C35/45.

The concrete is not only analysed with regard to load-related effects but also for non-load related effects. The various exposure classes provide information on the environmental influences that the concrete has to withstand for a prolonged period of time.



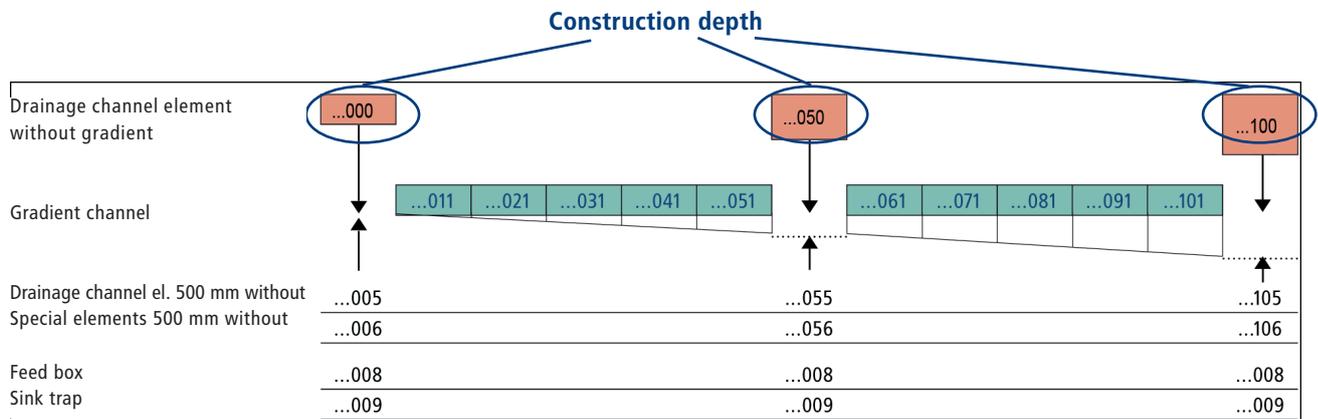
**HYDROTEC drainage systems are suitable for the following applications:**

Exposure class	Description of the application	Examples for the allocation of the	Minimum pressure
XC4	Alternately wet and dry	Outdoor parts with direct exposure to rain	C 25/30
XD3	Alternately wet and dry	Parts of bridges with frequent exposure to spray water containing chloride	C 35/45
XS3	Tidal areas, spray water and atomised spray water	Quay walls in ports	C 35/45
XF3	High water saturation, without thawing	Open water tanks	C 35/45
XA3	Chemically strong, corrosive environment	Industrial drainage systems with chemically corrosive waste water	C 35/45

Full information in DIN 1045-2

## ADDITIONAL INFORMATION

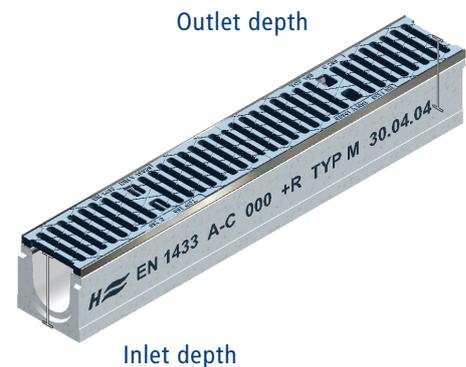
### Modular system



The modular system is a simple principle for selecting the required channel elements. It is possible to select channel elements without a slope (...000,...050,...100) and with a slope (...011,...021,...,....101). With the various depths it is possible to combine channel elements with and without slopes to achieve an optimum drainage performance.

#### **Example TOP 100:**

The channel run can start with five sloping channels (...011, ...021,...,....051). The individual numbers refer to the construction depth of the channel elements or the inlet and outlet depths. The number ...001 has an inlet depth of 160 mm and an outlet height of 165 mm. Correspondingly the next four channel elements are 5 mm higher, whereby the last element (...051) finishes with an outlet depth of 185 mm. Here another slope element (...061) or standard element (...050) can be connected, as both have an inlet depth of 185 mm. Another option would be another feed box or sink trap with a depth of 185 mm. Channel elements with a slope (TOP system) can be laid at a maximum construction depth of 210 mm (...101). Subsequent connection is only possible with standard elements (...100).



### Color preservation of gratings

Colored surface coatings on cast parts for traffic surface drainage only have a cosmetic function. This color coating cannot be regarded as general corrosion protection. During the production of cast iron a fine layer of iron dust is deposited on the cast part which can form red-brown marks when it comes into contact with moisture. These red marks are regarded as rust or patina that do not, however, have any negative effect on the cast iron functionality.

