

GENERAL INSTALLATION INFORMATION



INSTALLATION INSTRUCTIONS FOR DRAINAGE SYSTEMS

GENERAL INFORMATION ON THE CORRECT INSTALLATION AND OPERATION OF DRAINAGE CHANNELS

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INTRO

The installation instructions given here are to be understood as general information on the correct installation and operation of our drainage channel systems. It is recommended to always seek expert advice during the installation, which can also individually take the local particularities into account. Helpful information can be found **online**. In case of designs deviating from the standard, our application engineering staff will be pleased to help you. Proper installation, taking into account the applicable technical regulations and these installation instructions, is the basic prerequisite for a permanent functionality of the drainage channel systems. On the one hand, the information on the performance of the channels refers to a free, backflow-free outlet at the channel end (e.g. sediment bucket) and to a conscientiously maintained drainage channel system, and requires an adequately dimensioned pipe and duct system.

The covering adjoining the drainage channel elements and casing must be designed in such a way that the entry of horizontally acting loads (e.g. as a result of temperature expansion and/or braking and acceleration forces) is excluded.

The same applies to horizontal forces during the concreting process. Here, the drainage channel body must be sufficiently stiffened and/or the concreting process must be carried out step by step to avoid a deformation of the side walls.

A sufficient number of expansion joints regarding the position and design must be ensured or specified by the responsible planner. Joints running at right angles to the channel strand may only cross the gutter strand in the butt joint area of two channel elements. In this case, the expansion joint width must be represented by an appropriate design of the channel butt joint. Expansion joints in the longitudinal direction are never to be arranged directly at the channel!

Drainage systems from our drainage channel systems range in are primarily intended for the collection and drainage of rain water. For use in LAU plants (storage, filling and handling) in accordance with the VAWS (Ordinance for Plants Handling Substances Hazardous to Water), we recommend our systems with "General Building Inspectorate Approval" from the German Institute for Building Technology. Special installation instructions for systems with DIBT approval, notes on sealing and approval are available on request from our application technology department.

The classification of the load classes as well as information on requirements for the material and the installation of the channel elements can be found in the current edition of DIN EN 1433. Knowledge of the relevant regulations and ordinances by the executing specialist company is a prerequisite.

Please also observe the "General Installation information" listed below.

GENERAL INSTALLATION INFORMATION

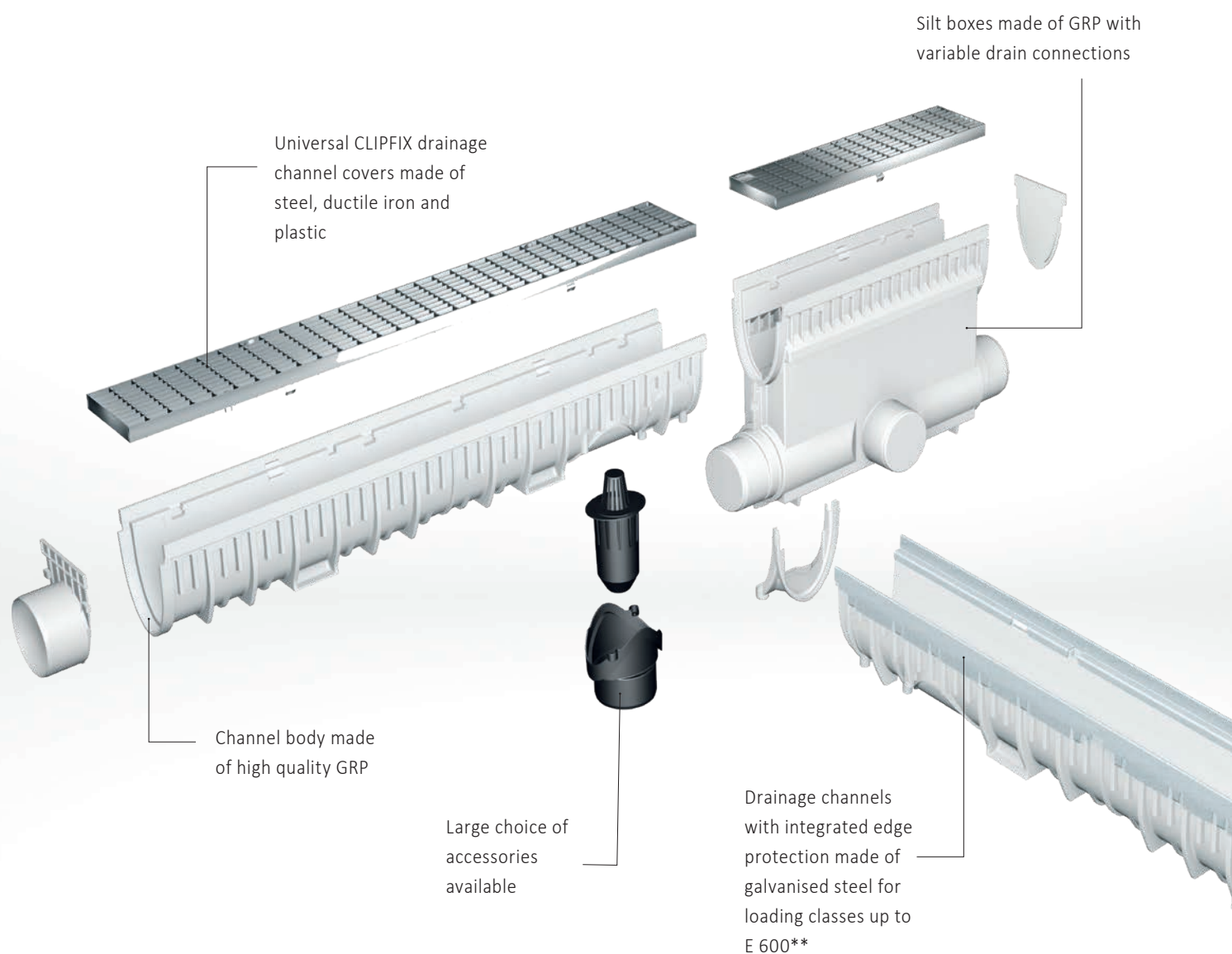
Our installation information provides generally valid suggestions. Special requirements for the channel installation due to local conditions must be specified by the planning party.

1. The class and installation location for the respective local installation situation must be taken into account.
2. Lay the adjacent side coverings 3-5 mm higher than the channel upper edge.
3. Exclude horizontal forces that can act on the channel strand from adjacent concrete surfaces or reinforced concrete structures by arranging effective expansion joints in the longitudinal and transverse directions. Never provide expansion joints in the longitudinal direction directly on the channel.
4. When concreting on or laying the side coverings, the gratings must be inserted into the channel rebate or the channels must be sufficiently stiffened against compression.
5. Mechanical damage to the channels during installation must be excluded, e.g. when compacting the adjacent surfaces.
6. The installation of the in-feed and sludge buckets is carried out according to the installation examples of the channels.
7. DIN EN 1433 prescribes the traffic-safe fastening of cover gratings from loading class C 250.
8. The adjacent covering must be designed in such a way that no horizontal forces act on the channel elements.
9. After the installation, the drainage channel bodies must be fitted with covers to achieve the stiffening.



I DRAINAGE SYSTEMS

MADE OF GRP (glass-fibre-reinforced composite)



**Not suitable for the diagonal or transverse travel of motorways and highways.

I GRP PREMIUM MATERIAL

All MEARIN channels systems are manufactured from high-quality GRP. GRP stands for glass-fibre-reinforced composite material, and is used in a broad range of applications with high requirements, including aircraft construction, the automotive industry and also in motorsports.

But not all GRP types are equal, as the quality and specific characteristics sometimes differ considerably. Thereby, we rely on SMC technology, (Sheet Moulding Compound) - a composite of polyester resin, mineral filler materials, additives and fibreglass mats.

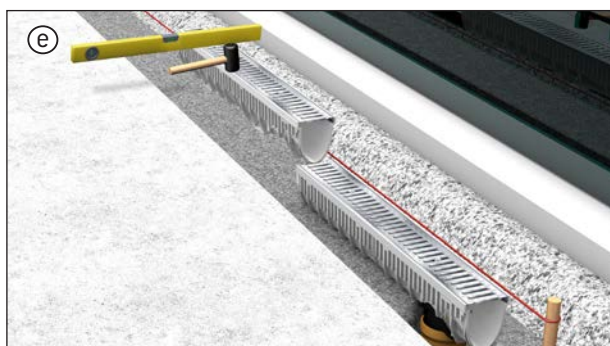
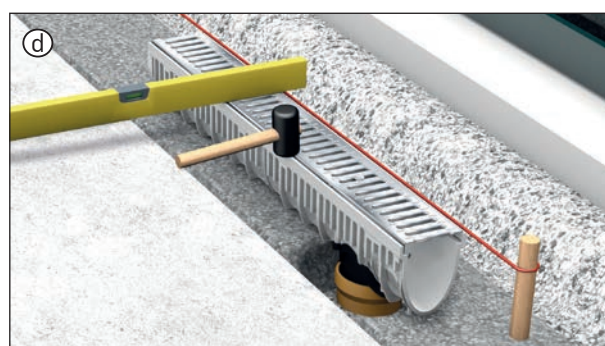
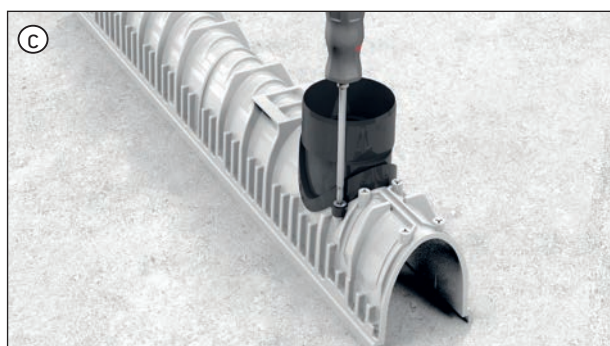
GRP convinces with the highest degree of strength and dimensional stability. This means extreme stability even under high temperatures, combined with a very low thermal expansion.

In contrast to thermoplastics, GRP can be not deform after curing, but rather remains stable and durable in its form. Our many years of experience and expertise with this material will guarantee light-weight and equally long-lasting products that create sustainable values for our customers and partners.



INSTALLATION INSTRUCTIONS

GRP DRAINAGE CHANNELS

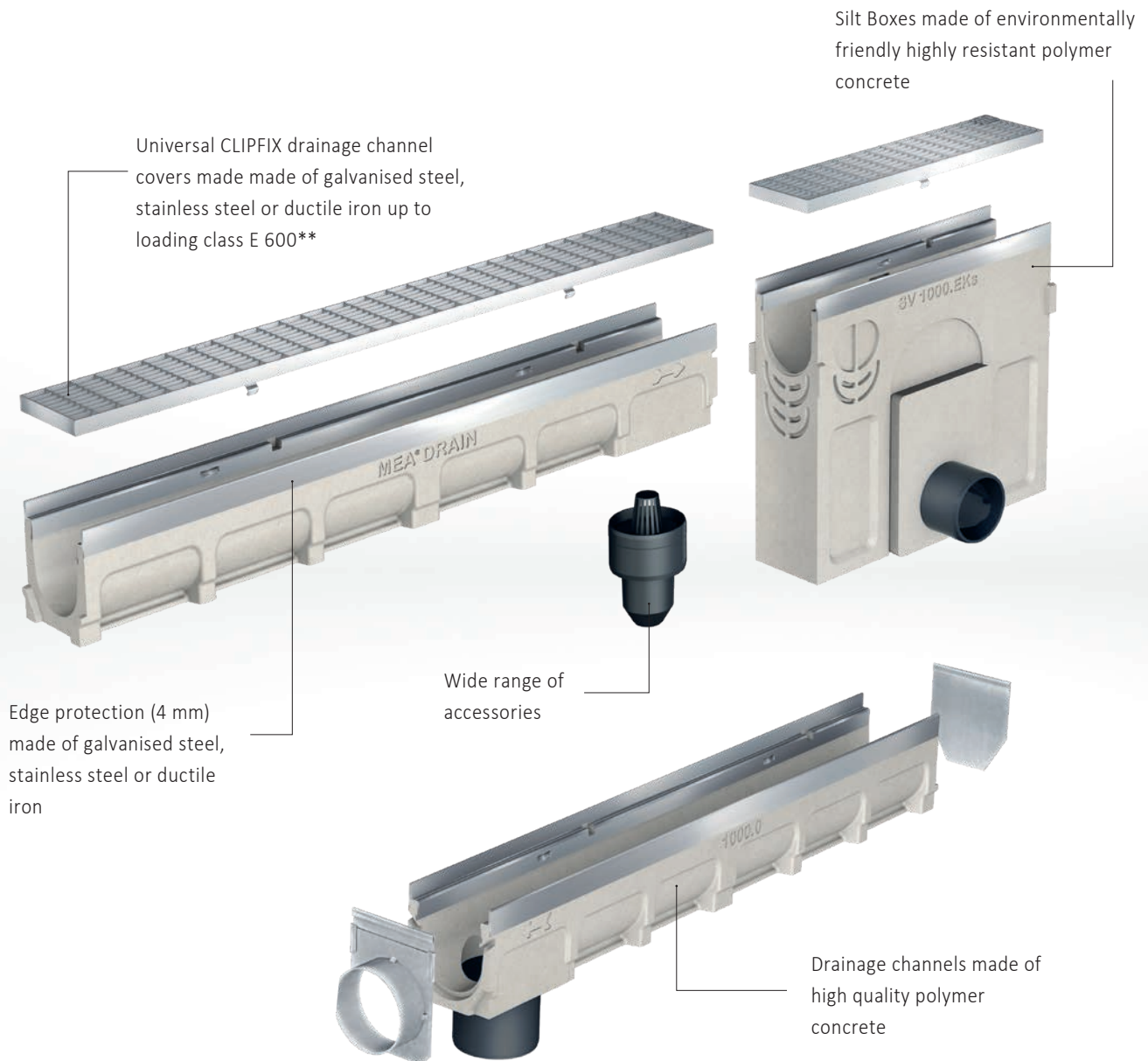


- a) Trench excavation, mortar bed according to Our specifications according to the loading classes.
- b) If needed the side or bottom drain preform can be cut with a jigsaw or similar equipment.
- c) Push on the drain socket and screw it tight.
- d) Install remaining drainage channel bodies with inserted grates and set the end caps.

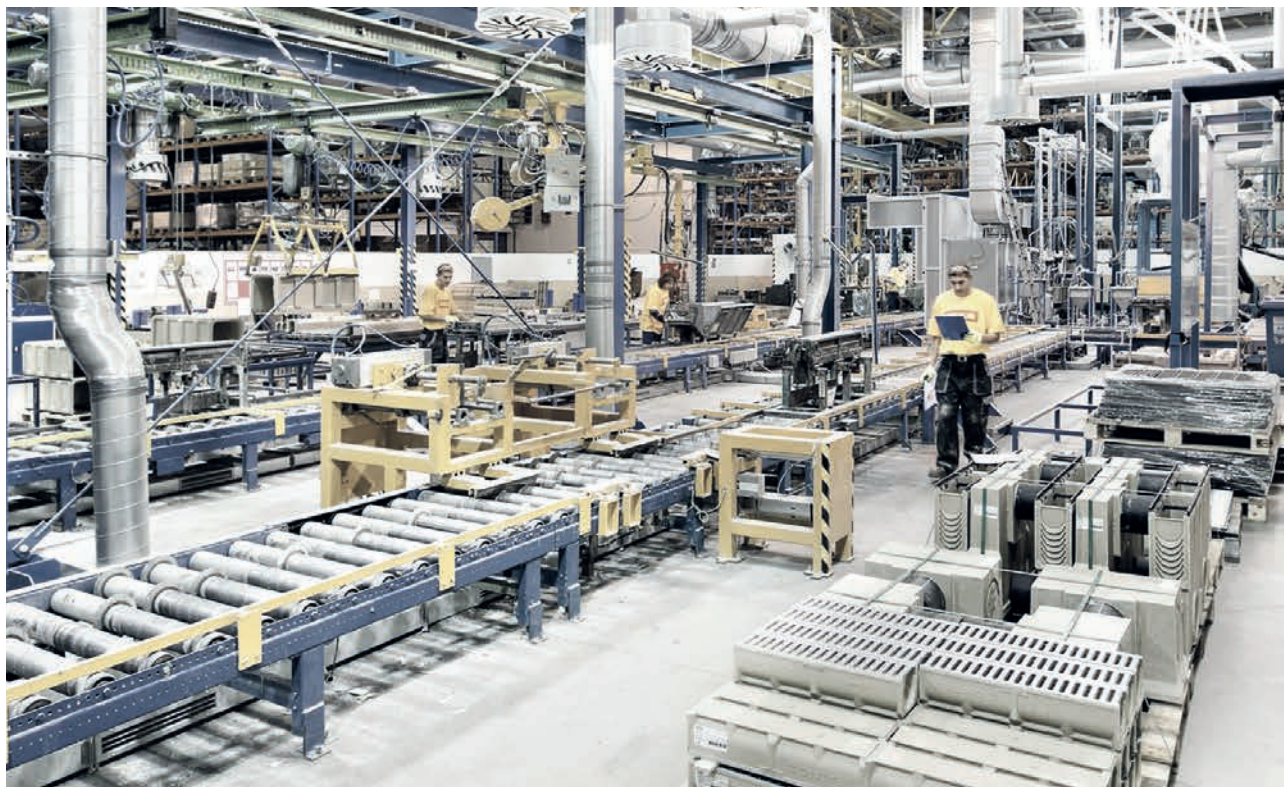
- e) Install remaining drainage channel bodies with inserted grates and set the end caps.
- f) Fill concrete laterally and then compact.
- g) Pave and insert odour trap in the drain.
- h) Lay adjoining floor covering 3-5mm higher than the top edge of the grating.

| DRAINAGE SYSTEMS

OF HIGH QUALITY POLYMER CONCRETE



**Not suitable for the diagonal or transverse travel of motorways and highways.



I POLYMER CONCRETE

THE QUALITY MATERIAL

POLYMER CONCRETE

The special polymer concrete from us is remarkable for its outstanding physical and chemical properties. This material is extremely sturdy, reliable and versatile making it the material of choice for drainage channels. Our polymer concrete channels are particularly eco-friendly. Mostly made out of minerals, polymer concrete channels are easy to recycle. Because of the quality material channels have a particularly long lifetime, saving future investments and unnecessary new building sites. Polymer concrete channels are the more extremely resistant to liquid chemicals and acids, making them the perfect protection devices for the environment and ground waters.

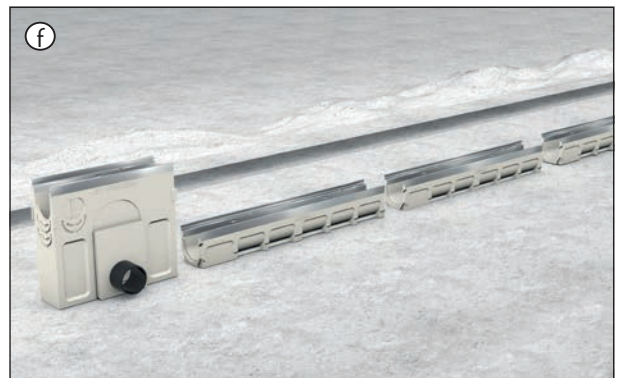
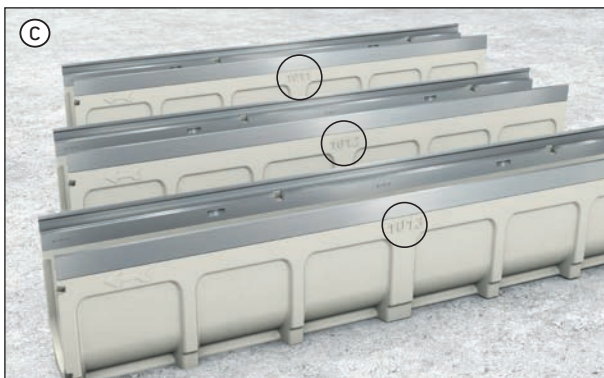
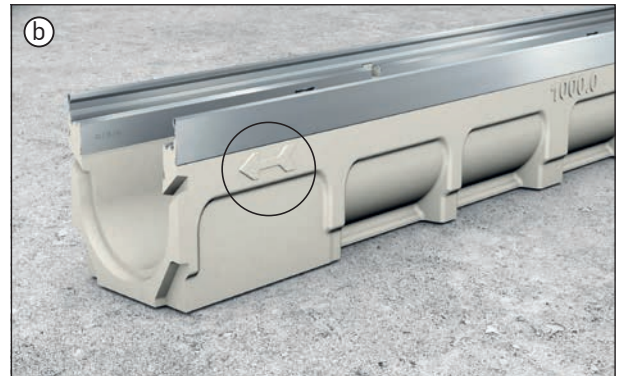
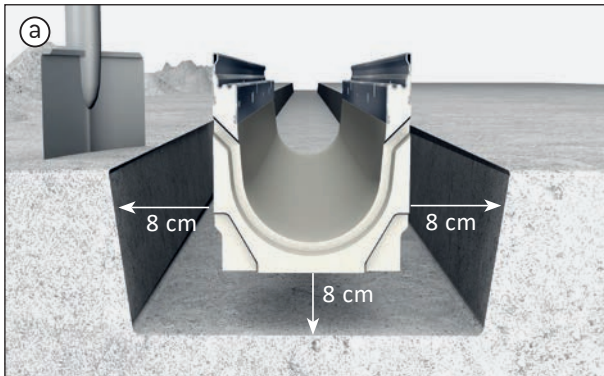
Last but not least, polymer concrete channels are significantly lighter than comparable concrete channels, making them considerably easier to install.

MATERIAL CHARACTERISTICS

Compressive strength	> 90 N/mm ²
Flexural tensile strength	> 22 N/mm ²
Water adsorption	Below 0.05%
Modulus of elasticity	25-35 kN/mm ²
Density	2.1 - 2.3 kg/dm ³
Water ingress depth	0 mm
Material structure	Capillary-free – ideal for the rapid discharge of water and dirt particles
Channel body weight	Significantly lighter than conventional concrete channels
Workability	Suitable for grinding disks, rock drills and chisels
Environmental compatibility	Eco-friendly building material with mineral admixtures
Ageing resistance	Entirely frost proof, wear-resistant, and maintenance-free. Highly resistant to liquid chemicals (pH range 3 to 9)

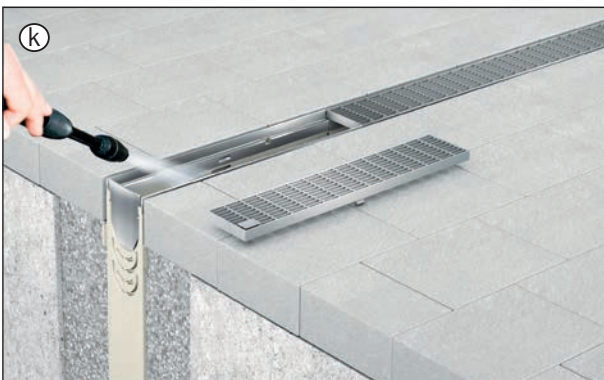
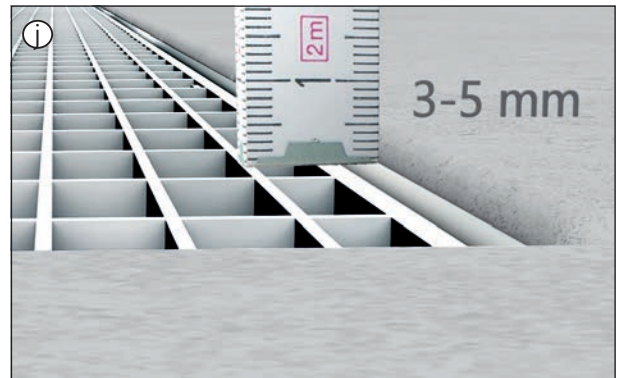
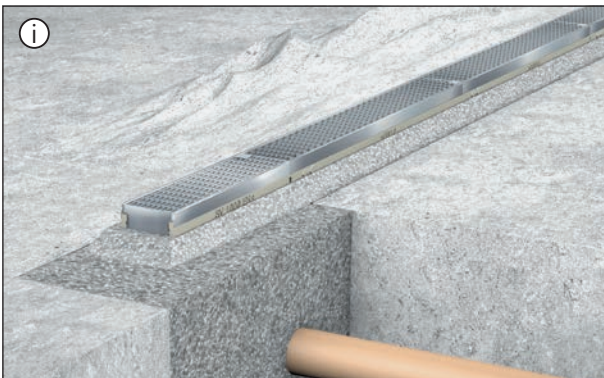
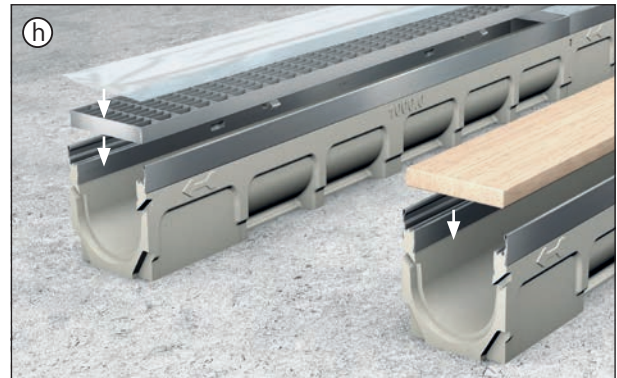
INSTALLATION INSTRUCTIONS

DRAINAGE CHANNELS MADE OF POLYMER CONCRETE



- a) Excavate a trench in sufficient width to ensure a concrete cover of min. 8 cm (loading class A 15). For greater loadings, refer to the pages 13 to 15 in this document. The load bearing capacity of the subsoil and the trench bottom must be guaranteed or, if necessary, prepared. The minimum concrete quality specified in the installation instructions for the corresponding loading class must be observed.
- b) For each channel element, the direction of flow is marked with direction arrows pointing in the direction of the outlet point.
- c) In the case of slope gradients, the numbers visible on the drainage channel body indicate the position of the channel in the drainage line, e.g. No. 1010/1011/1012.

- d) If needed, the drain preforming of the channel can be knocked out. First pre-drill in the recess around the opening from the outside with a suitable drill.
- e) Turn the channel over and place a squared timber close to the drainage opening, and then knock it out carefully with a hammer from the inside. Then carefully knock it out with a hammer from the inside to the outside.
- f) Laying the channel elements in the planned sequence along the excavated trench (according to any possibly existing installation plan).



g) Tension the cord, pour concrete into the trench and lay the channel strand, starting from the drainage point (e.g. in-feed box). Install the silt box and sediment bucket according to the installation examples of the channels (thickness of the concrete casing). When laying the channels observe the direction of the arrow - towards the outlet point. Install the appropriate end caps at the start/end of the channel strand. Connect the outlet point to the sewage system.

h) Reinforce the drainage channel body against lateral compression or insert gratings into the channel rebate. Protect gratings against contamination by concrete. For bolted gratings, the tightening torque of 20 NM may not be exceeded.

i) Apply lateral concrete coating evenly on both sides of the channels. When installing in concrete surfaces and floating laid paving, plan an expansion joint, i.e. do not interrupt existing expansion joints through the drainage line.
Never place expansion joints directly on the channel.

j) Pavement or any type of surfacing directly adjacent to the channel lining should be 3 - 5 mm higher than the channel upper edge.

k) Clean any dirt from gratings, channels and drain points, insert gratings and connect them firmly to the drainage channel body using grating protections (according to DIN EN 1433 the installation of the grating protection is mandatory from loading class C 250). For bolted gratings, the tightening torque of 20 NM may not be exceeded.



SEALING DRAINAGE CHANNEL

Use in LAU systems (storage/filling/transshipment of water-endangering substances):

Only our MEADRAIN EN drainage channel systems are approved for this purpose.

Please refer to the installation instructions of our DIBt approval Z-74.4-28 and the relevant approvals for the sealants used for waterproofing MEADRAIN EN drainage channel systems against water-polluting substances in the area of LAU systems. The sealing must be carried out by a sealing company certified by the sealant manufacturer.

Use in non-approval-relevant areas:

For the sealing of our drainage channels in non-approval-relevant areas, we recommend the use of the MS Floor sealant. We recommend the use of the sealants SABA MS Floor and SABA MS Floor SL especially for multi-storey car park applications.

For these sealants, please use the matching primer SABA Primer 9102 and the cleaner for the adhesive flanks SABA Solvent 48.

SABA MS Floor - Advantages:

- > Rugged
- > Resistant to road salt, weak acids and chemicals
- > Resistant to short-term exposure to contaminated (oil) products. Regular control measures must be observed.

SABA MS Floor SL - Advantages:

- > Self-levelling, no need for subsequent smoothing
- > Resistant to road salt, weak acids and chemicals
- > Resistant to short-term exposure to contaminated (oil) products. Regular control measures must be observed.
- > High abrasion resistance

SABA MS Floor and SABA MS Floor SL - Processing:

The substrate must be clean, free of grease and load-bearing. Cleaning of the adhesive flanks with SABA Solvent 48. Primer coat with SABA Primer 9102. Observe the processing instructions of the sealant manufacturer!

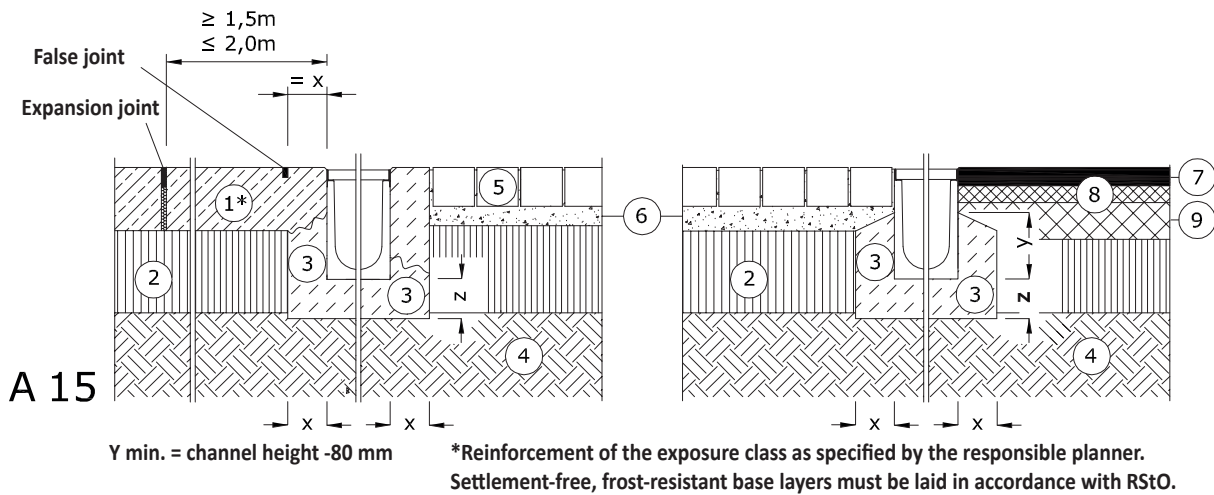
INSTALLATION INSTRUCTIONS A 15



A 15

Traffic areas that can be exclusively used by pedestrians and cyclists.

(Test force 15 kN)



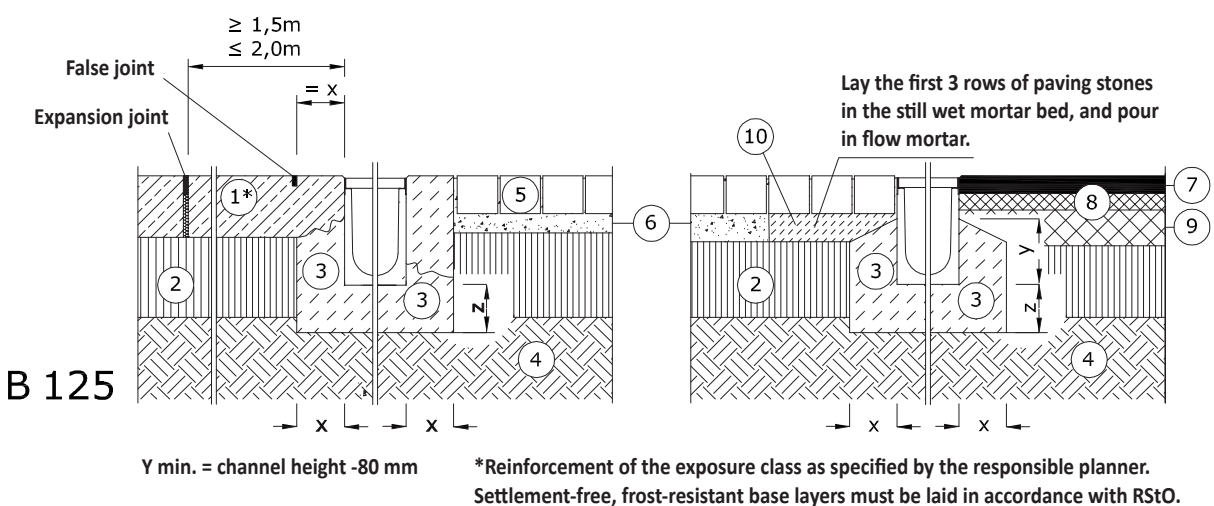
INSTALLATION INSTRUCTIONS B 125



B 125

Sidewalks, pedestrian zones and similar areas, car parking areas and car parking decks

(Test force 125 kN).



- | | | | | |
|---------------------------------|--------------------|-----------------|-------------------------|-------------------------|
| ① Road concrete | ③ Concrete coating | ⑤ Pavement | ⑦ Bituminous base cover | ⑨ Bituminous base layer |
| ② Base course according to RstO | ④ Grown soil | ⑥ Pavement base | ⑧ Binder layer | ⑩ Mortar bed |

The adjacent covering must be designed in such a way that no horizontal forces act on the channel elements. After the installation, the drainage channel bodies must be fitted with covers to achieve the stiffening.

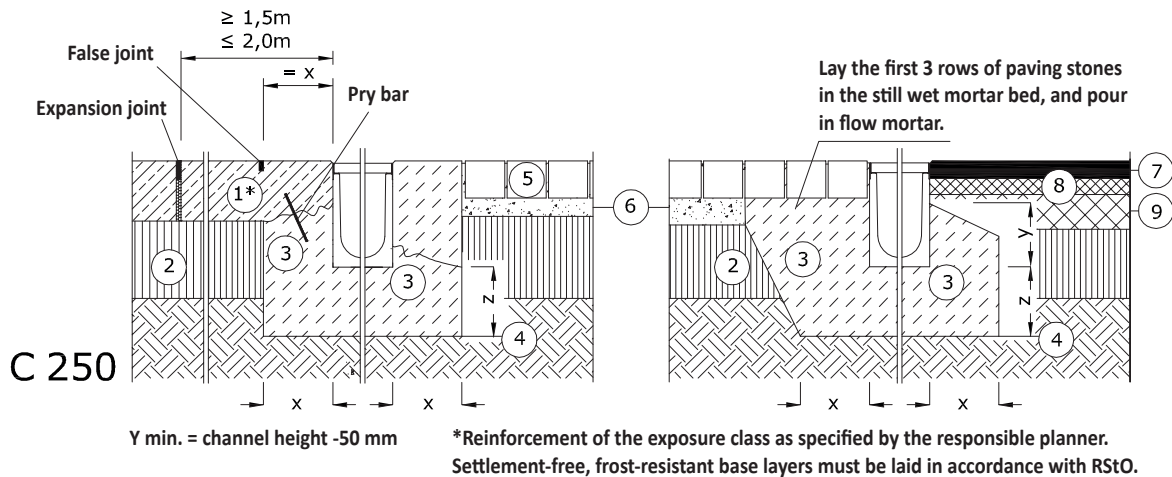
INSTALLATION INSTRUCTIONS C 250



C 250

Floor channel area and untraveled road shoulders and similar.

(Test force 250 kN)

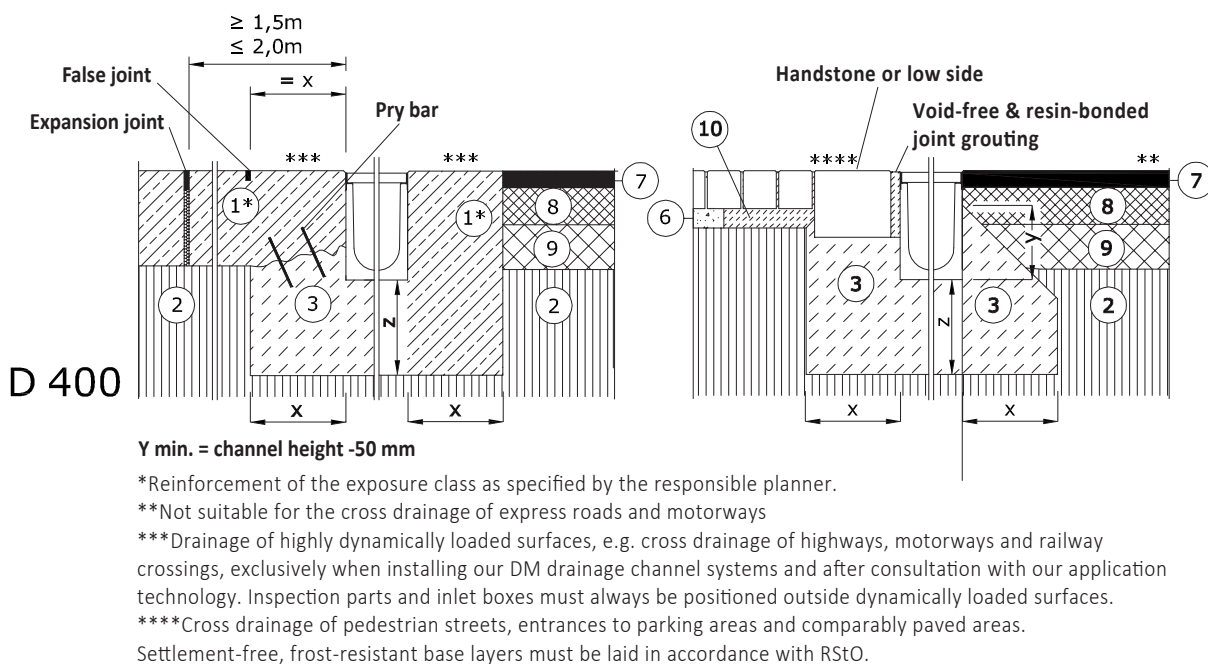


INSTALLATION INSTRUCTIONS D 400



D 400

Lanes of roadways (also pedestrian roads), shoulders of roads and parking areas approved for all types of road vehicles. (Test force 400 kN)



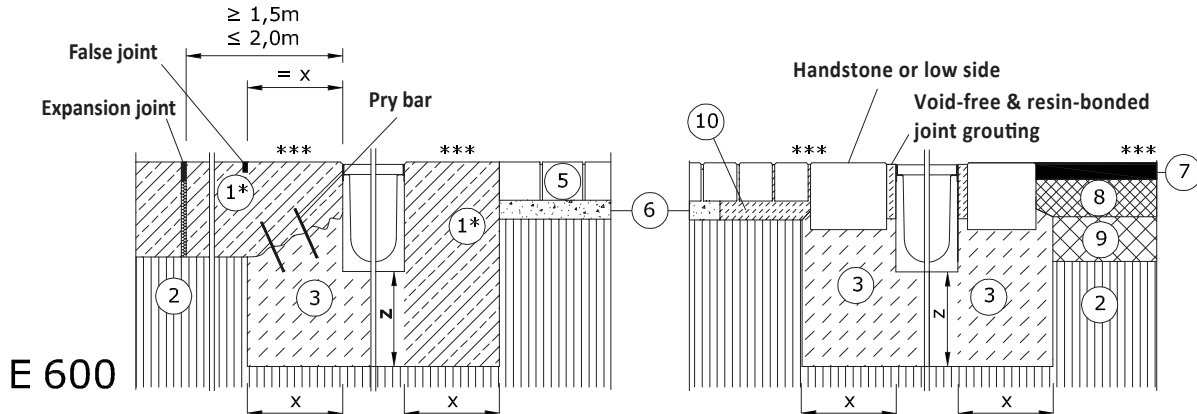
- | | | | | |
|---------------------------------|--------------------|-----------------|-------------------------|-------------------------|
| ① Road concrete | ③ Concrete coating | ⑤ Pavement | ⑦ Bituminous base cover | ⑨ Bituminous base layer |
| ② Base course according to RstO | ④ Grown soil | ⑥ Pavement base | ⑧ Binder layer | ⑩ Mortar bed |

The adjacent covering must be designed in such a way that no horizontal forces act on the channel elements. After the installation, the drainage channel bodies must be fitted with covers to achieve the stiffening.

INSTALLATION INSTRUCTIONS E 600



Areas that are driven upon by high wheel loads, e.g. harbours and dock facilities.
(Test force 600 kN)



*Reinforcement of the exposure class as specified by the responsible planner.

***Drainage of highly dynamically loaded surfaces, e.g. cross drainage of highways, motorways and railway crossings, exclusively when installing our DM drainage channel systems and after consultation with our application technology. Inspection parts and inlet boxes must always be positioned outside dynamically loaded surfaces.

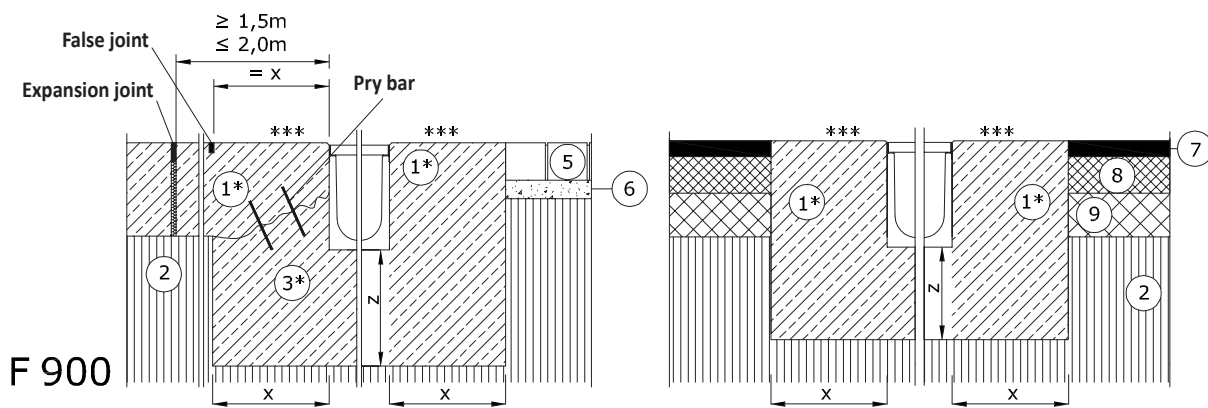
****Cross drainage of pedestrian streets, entrances to parking areas and comparably paved areas.

Settlement-free, frost-resistant base layers must be laid in accordance with RStO.

INSTALLATION INSTRUCTIONS F 900



Surfaces that are driven on with particularly high wheel loads, e.g. aviation areas.
(Test force 900 kN)



*Reinforcement of the exposure class as specified by the responsible planner.

***Drainage of highly dynamically loaded surfaces, e.g. cross drainage of highways, motorways and railway crossings, exclusively when installing our DM drainage channel systems and after consultation with our application technology. Inspection parts and inlet boxes must always be positioned outside dynamically loaded surfaces.

****Cross drainage of pedestrian streets, entrances to parking areas and comparably paved areas.

Settlement-free, frost-resistant base layers must be laid in accordance with RStO.

- | | | | | |
|---------------------------------|--------------------|-----------------|-------------------------|-------------------------|
| ① Road concrete | ③ Concrete coating | ⑤ Pavement | ⑦ Bituminous base cover | ⑨ Bituminous base layer |
| ② Base course according to RstO | ④ Grown soil | ⑥ Pavement base | ⑧ Binder layer | ⑩ Mortar bed |

The adjacent covering must be designed in such a way that no horizontal forces act on the channel elements. After the installation, the drainage channel bodies must be fitted with covers to achieve the stiffening.

FOUNDATIONS

The requirements for the concrete with regard to durability against environmental influences must generally be specified by the planner by specifying the corresponding exposure class.

For example: Exposure class for road concrete for the transverse drainage of highways and freeways C30/37 (LP), XF4, XM2 (Source: Cement Concrete Technology Information Leaflet B9 3.2006, www.beton.org)

MEADRAIN POLYMER CONCRETE DRAINAGE CHANNELS

The max. loading class for the selected drainage channel system can be found in brochure documents, data sheets and price lists and may not be exceeded.

Loading classes according to EN 1433	A 15 kN	B 125 kN	C 250 kN	D 400 kN	E 600 kN	F 900 kN
Foundation dimensions X (mm)	> 80	> 100	> 150	> 200	> 200	> 250
Foundation dimensions Z (mm)	> 80	> 100	> 150	> 200	> 200	> 250
Reinforcement of the concrete casing (3) as specified by the responsible planner	no	no	no	yes	yes	yes
Concrete quality DIN EN 206-1/DIN 1045-2 for road concrete (1) \geq C 30/37 with reinforcement.	\geq C 12/15	\geq C 20/25	\geq C 20/25	\geq C 25/30	\geq C 25/30	\geq C 30/37

MEACRET CONCRETE DRAINAGE CHANNELS

The max. loading class for the selected drainage channel system can be found in brochure documents, data sheets and price lists and may not be exceeded.

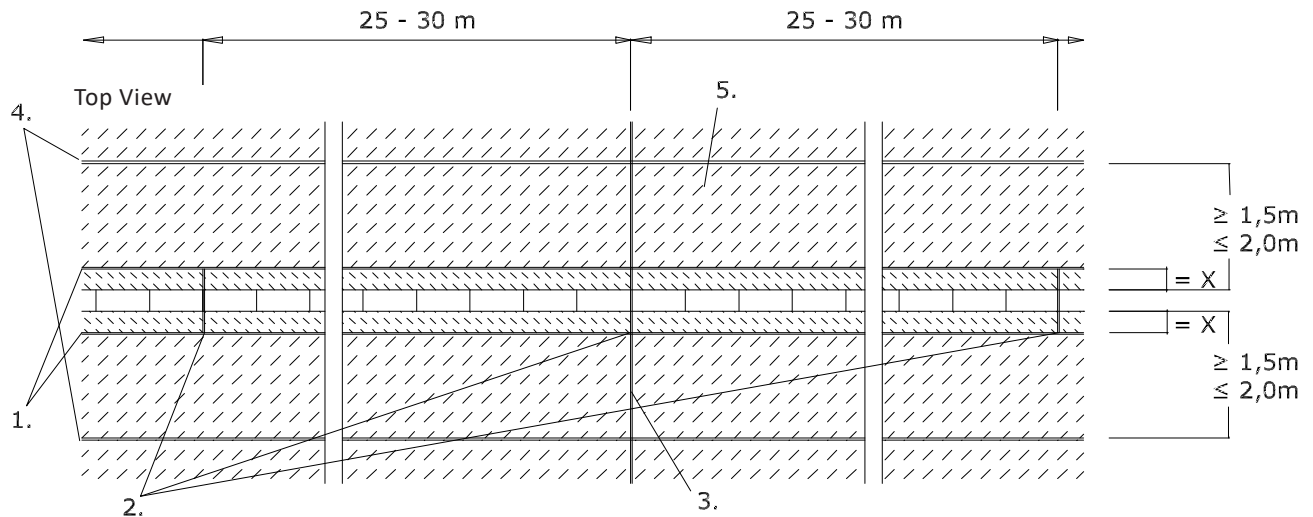
Loading classes according to EN1433	A 15 kN	B 125 kN	C 250 kN	D 400 kN	E 600 kN	F 900 kN
Foundation dimension X (mm)	> 80	> 100	> 150	> 150	> 150	> 200
Foundation dimension Z (mm)	> 80	> 100	> 150	> 200	> 200	> 250
Reinforcement of the concrete casing (3) as specified by the responsible planner	no	no	no	yes	yes	yes
Concrete quality DIN EN 206-1/DIN 1045-2 For road concrete (1) \geq C 30/37 with reinforcement	\geq C 12/15	\geq C 20/25	\geq C 20/25	\geq C 25/30	\geq C 25/30	\geq C 30/37

MEARIN CHANNELS MADE OF GLASS-FIBRE REINFORCED COMPOSITE MATERIAL

The max. loading class for the selected drainage channel system can be found in brochure documents, data sheets and price lists and may not be exceeded.

Loading classes according to EN1433	A 15 kN	B 125 kN	C 250 kN	D 400 kN	E 600 kN
Foundation dimension X (mm)	> 80	> 100	> 150	> 200	> 200
Foundation dimension Z (mm)	> 80	> 100	> 150	> 200	> 200
Reinforcement of the concrete casing (3) as specified by the responsible planner	no	no	no	yes	yes
Concrete quality DIN EN 206-1/DIN 1045-2 For road concrete (1) \geq C 30/37 with reinforcement	\geq C 12/15	\geq C 20/25	\geq C 20/25	\geq C 25/30	\geq C 25/30

EXPANSION JOINTS



If there are no other specifications from the planning side, we recommend maintaining the expansion joints as shown above.

1. False joint
2. Expansion joints perpendicular to the channel strand in the concrete casing. - Recommendation for Central Europe: Distance of the expansion joints across the channel strand 25m to 30m.
In countries with extreme climatic conditions, the speci-

cations of the responsible planner apply.

3. The determination of the expansion joints in the road concrete is the sole responsibility of the planner responsible for the building or the local site management.
4. Expansion joint parallel to the channel strand. A direct arrangement of expansion joints between the drainage channel body and adjacent channel casing is not permitted. The minimum distance "x" must be observed.
5. Concrete Road Pavement



This general installation information is solely valid as of april 2022 until the publication of a revised version and replaces any earlier publications.



I DRAINAGE SOLUTIONS

AREAS OF APPLICATION



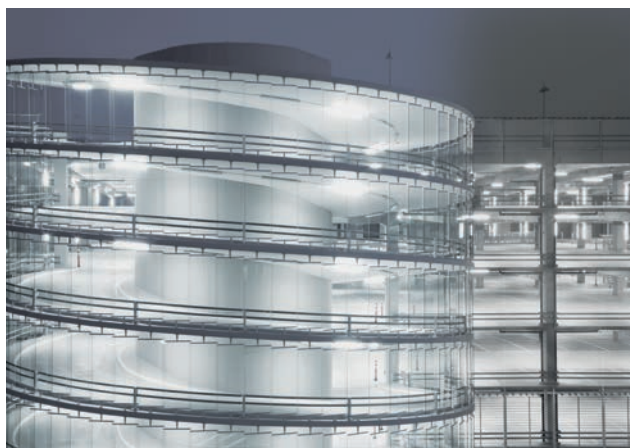
STREETS AND ROADS



GARDENING AND LANDSCAPING



TOWN CENTRES AND PEDESTRIAN AREAS



PARKING GARAGES



HOME AND GARDEN



PARKING SPACES



INDUSTRY AND COMMERCE