

# MEACLEAN PRO

FUNCTION, INSTALLATION  
AND MAINTENANCE



**INSTALLATION INSTRUCTIONS MEACLEAN PRO**  
DIBT CERTIFIED CLEANING SYSTEM

# IINTRO

MEACLEAN PRO is a rain water treatment system and functions as a fully-fledged alternative to the revitalised soil zone. The purification and treatment of organically and inorganically polluted precipitation run-off poses an increasing challenge. Especially in the field of rain water treatment for heavily frequented traffic areas via the revitalised soil zone / channel, problems are encountered more and more frequently during the planning stage, which are related to the space required for the channel. In addition to the concept of the below-ground activated sludge zone, the need for above-ground alternatives has developed strongly in recent years. This is where MEACLEAN PRO comes in. The system represents a modern and fully-fledged rain water treatment system in the form of a linear drainage system.

With its multi-stage substrate technology, it handles the treatment of precipitation runoff containing mineral oil. The MEACLEAN PRO system allows rain water to be treated and seeped away directly on site. Precipitation runoff from heavily frequented properties, parking and traffic areas (such as: P+R squares, shopping centres, commercial yards, main & secondary roads, motorways, airports) can now be drained directly via the system, cleaned and fed directly to a downstream infiltration system. This saves costs for the underground infrastructure and protects the groundwater from further subsidence.



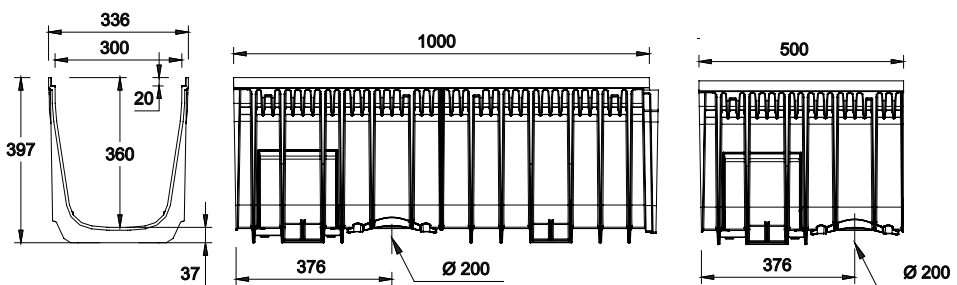
# TECHNICAL DATA

Dimensions (W x H x D mm)	336 x 397 x 500/1000
Drainage channel body material:	Glass-fibre reinforced composite
Material cover/grating:	Mesh grating in galvanised steel C 250, web and WAVE grating in cast iron EN-GJS up to E 600
Material Substrate zone:	Tested and certified high-performance substrates, Biocalith MR-F1 and Biocalith K
Connectable area (m <sup>2</sup> ):	15 m <sup>2</sup> /running metre of channel (at 100 l/s ha according to DIBt test specifications)
Seepage capacity substrate:**	1 to 3 x 10E-3 m/s
Mode of action:*	Mechanical retention/ filtration, adsorption, sorption, precipitation and complexation
Service life:**	More than 25 years depending on application
Weights (in kg):	drainage channel body 10 or 11.8 kg (PLUS and EXPERT variants), substrate 79 kg, grates between 13.15 and 31.15 kg depending on the variant
Loading classes:	MEACLEAN PRO PLUS: A 15 to D 400, MEACLEAN PRO EXPERT: A 15 to E 600
Certificate/Tests:*	DIBt test / test number: Z-84.2-16, NaCl/Streusalz shock tested, Third-party expert report according to VWK-A 138/DWA M 153, DIN EN 1433

\*Enregis Biocalith MR-F1/K

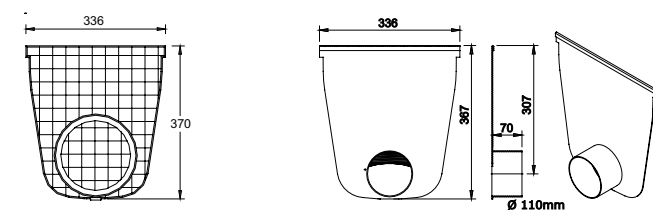
\*\*Data is from average values and refers to precipitation runoff from parking lots. We are gladly at your disposal for detailed project planning.

## INDIVIDUAL COMPONENTS



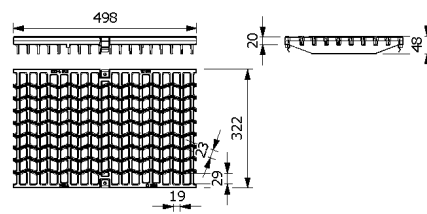
Channel MEARIN PLUS 300.0, Length: 1000 mm

MEARIN PLUS 300.1RW



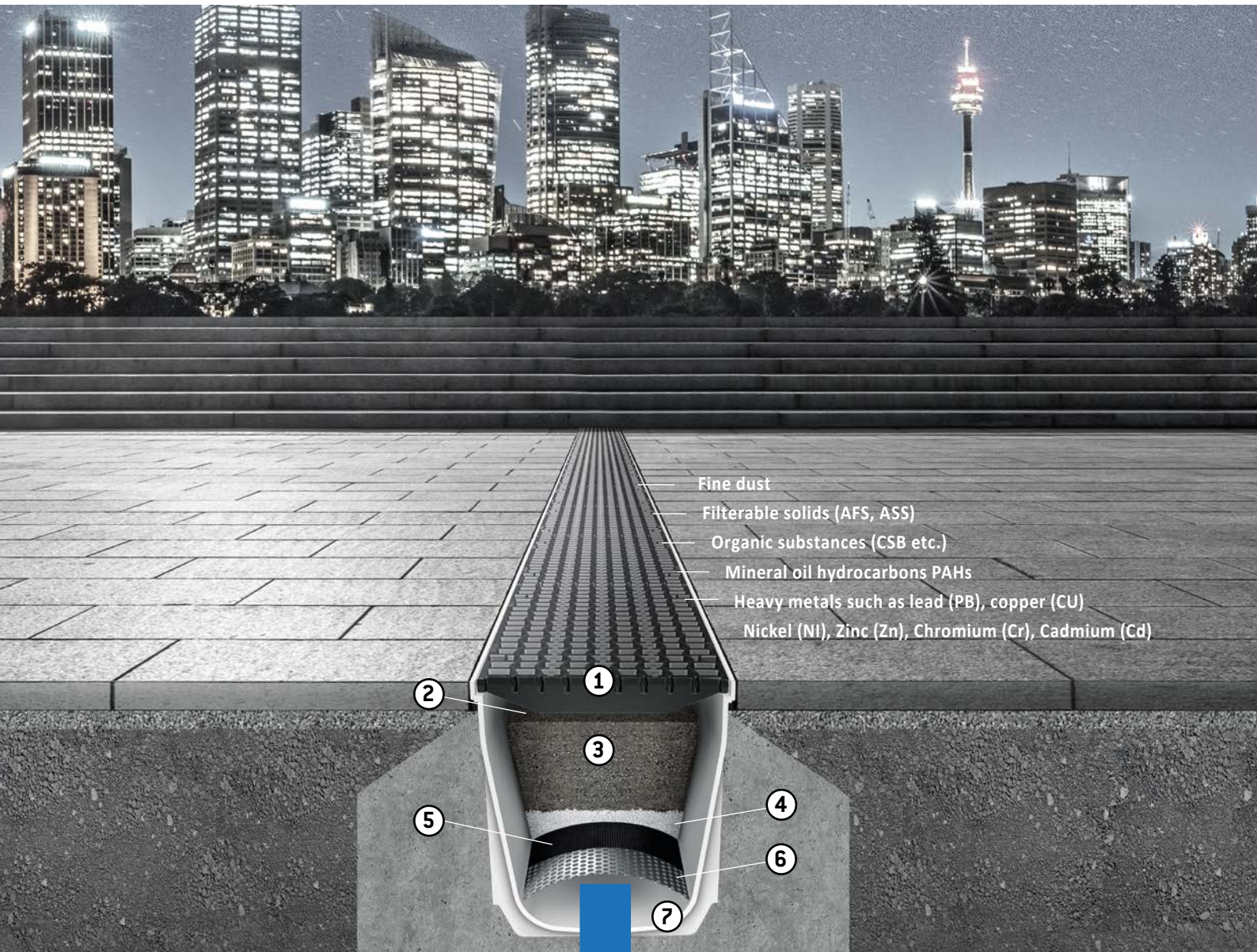
End cap V2A closed for channel start/end

End cap V2A with connector Ø 110 mm



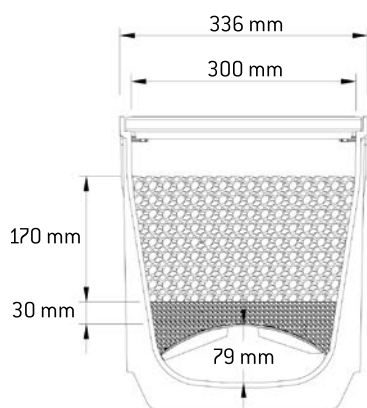
Ductile iron grating WAVE





Fine dust  
 Filterable solids (AFS, ASS)  
 Organic substances (CSB etc.)  
 Mineral oil hydrocarbons PAHs  
 Heavy metals such as lead (PB), copper (CU)  
 Nickel (NI), Zinc (Zn), Chromium (Cr), Cadmium (Cd)

# CLEAN WATER



Support perforated plate

- 1- Covers available in loading classes up to E 600
- 2- Retention space for surface water
- 3- First substrate layer: Mineral mixture ENREGIS Biocalith MR- F1 for the treatment of organically polluted rain water (CHC)
- 4- Second substrate layer: Mineral mixture ENREGIS Biocalith K for the treatment of inorganically polluted rain water (heavy metals)
- 5 - Geotextile for the retention of fine particles
- 6 - Curved spacer ensures permanently free drainage channel cross section
- 7 - Extremely stable drainage channel body made of glass-fibre-reinforced composite

# GENERAL INFORMATION

## FOR WORK PREPARATION

Please note that seepage and filter systems require official approval, and that this must be checked before installation. The respective regional official and legal regulations must be observed. Furthermore, the relevant German and European standard regulations as well as the valid worksheets of DWA 138 must be observed. Ensure that all mounting and inspection work is carried out by a qualified specialist company which has sufficiently informed itself by studying the operating instructions in detail, and has familiarised itself with the special features of the product.

Observe the existing accident prevention regulations. Specifically:

- > AAR "Construction work" VBG37
- > AAR "Excavators, loaders, scrapers and special earth-moving machines" VBG40
- > DIN 4124 Excavation pits and trenches, guidelines for backfilling and compacting excavation pits and others

Dimensioning must be carried out in accordance with the currently valid worksheet DWA-A 138, taking into account the rainfall figures from the KOSTRA-DWD 2000 Atlas of the German Weather Service. Outside Germany, the respective national laws and regulations must be observed. In order to avoid malfunctions of the system, the Kf value of the surrounding soil must be determined by an expert in the form of a soil survey.

Proof of the correctness of the intended use must be provided to in accordance with ATV-M153 and agreed with the local authorities in the course of the water law permit.

**PLEASE NOTE THAT THESE AND THE FOLLOWING INSTRUCTIONS ARE ABSOLUTELY OBSERVED!**

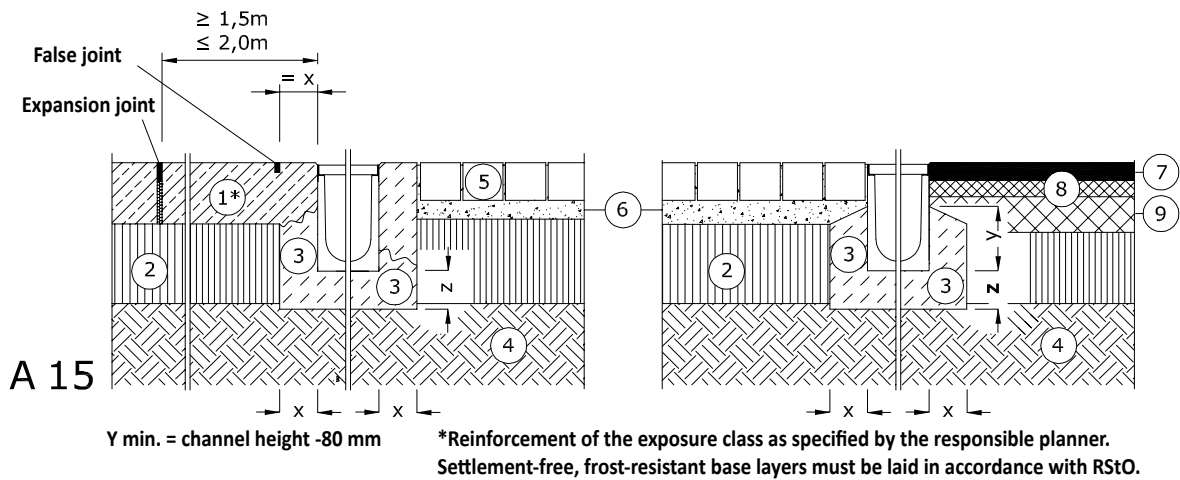
**We recommend:**

- > To contact the competent authority before the start of construction,
- > To ensure a compliance with the various local regulations
- > In connection with the MEACLEAN PRO, check the combined use of our seepage filters and the MEA seepage boxes
- > Furthermore, a connection to the MEASTORM chamber 300 and 1600 is possible

# INSTALLATION INSTRUCTIONS A 15



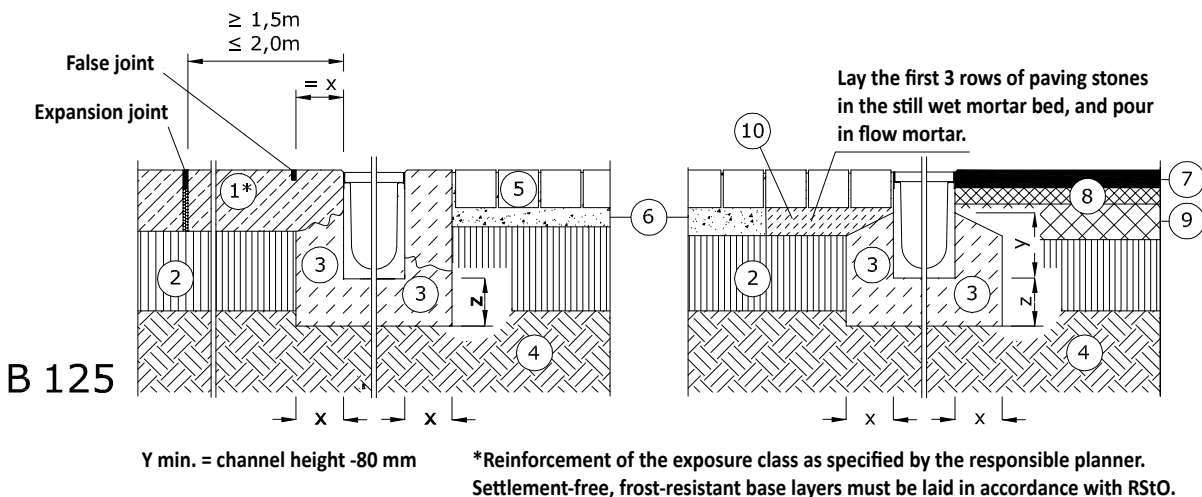
Traffic areas that can be exclusively used by pedestrians and cyclists.  
(Test force 15 kN)



# INSTALLATION INSTRUCTIONS B 125



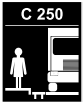
Sidewalks, pedestrian zones and similar areas, car parking areas and car parking decks  
(Test force 125 kN).



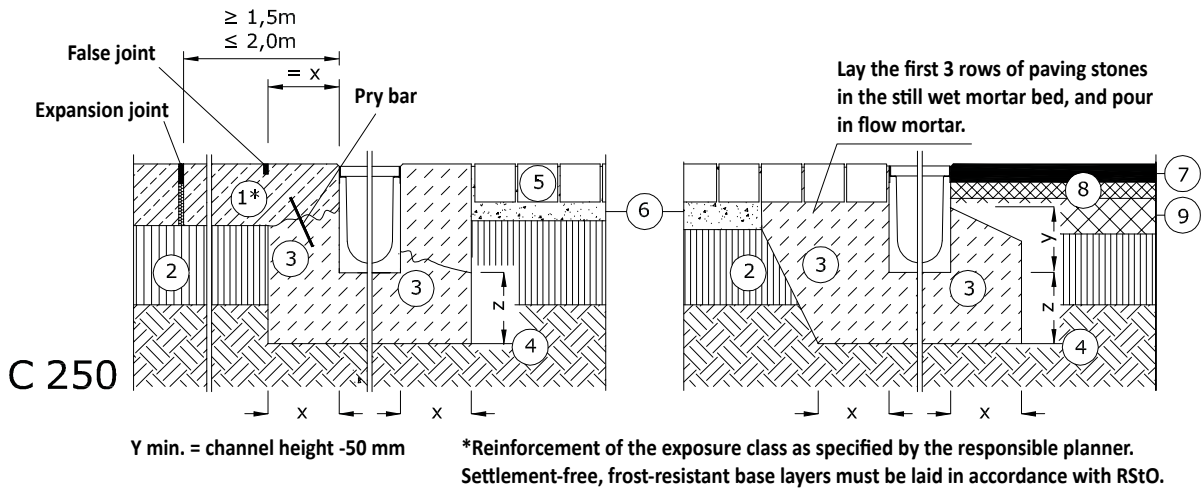
- ① Road concrete                      ③ Concrete coating   ⑤ Pavement                      ⑦ Bituminous base cover   ⑨ Bituminous base layer
- ② Base course according to RstO   ④ Grown soil                      ⑥ Pavement base                      ⑧ Binder layer                      ⑩ Mortar bed

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



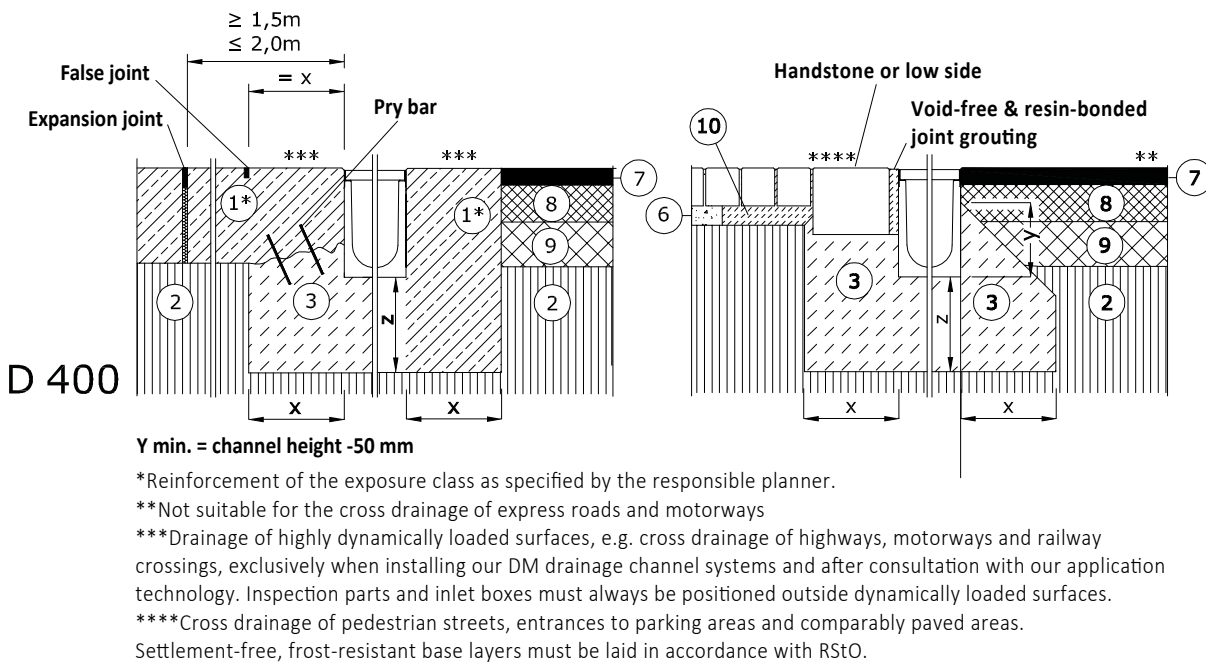
Floor channel area and untraveled road shoulders and similar.  
(Test force 250 kN)



# INSTALLATION INSTRUCTIONS 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

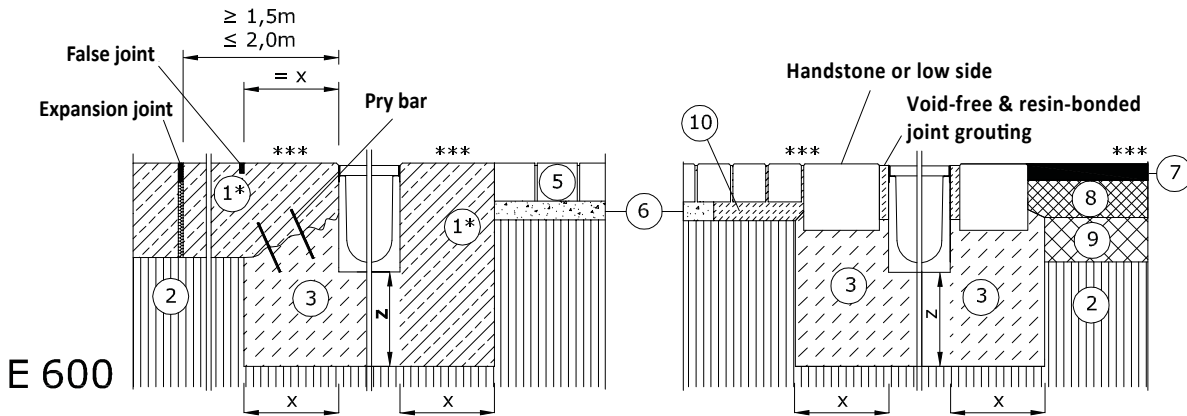
The adjacent covering must be designed in such a way that no horizontal forces act on the channel elements. After the installation, the drainage channel bodies must be fitted with covers to achieve the stiffening.



# 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.

- 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)

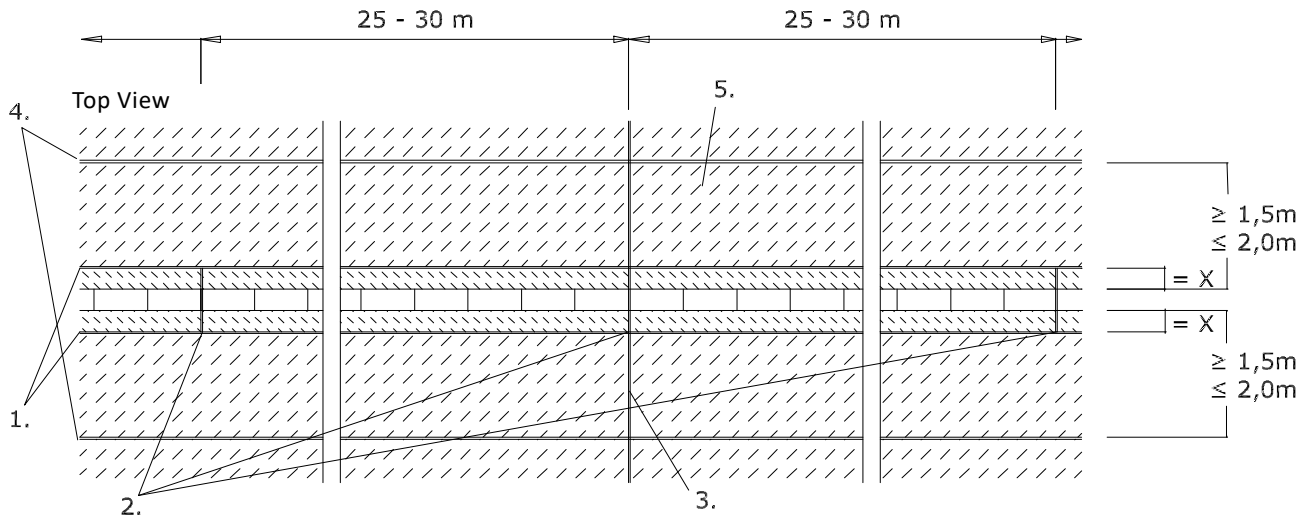
### MEARIN CHANNELS MADE OF GLASS-FIBRE REINFORCED COMPOSITE MATERIAL

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) ≥ C 30/37 with reinforcement	≥ C 12/15	≥ C 20/25	≥ C 20/25	≥ C 25/30	≥ 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. MEA - 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



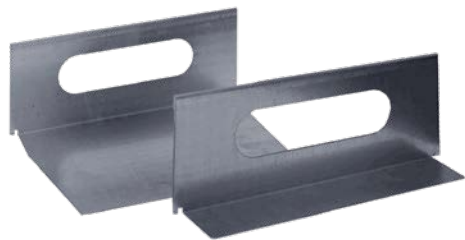
- > All upper edges of the finished covering should be approx. 3 - 5 mm above the upper edge of the grating.
- > Load data is only valid when using the corresponding grates and complying with the MEA installation guidelines.
- > The expansion joints may not be interrupted by the channel strand.



## INSTALLATION TOOLS

**WE RECOMMEND TO HAVE THE FOLLOWING TOOLS READY FOR THE INSTALLATION OF THE MEACLEAN PRO CHANNEL ELEMENTS:**

- 1) Concrete and/or grit in sufficient quantity depending on the installation situation, see also rule details of the different loading classes.
- 2) Required civil engineering equipment: Depending on the size of the project, a shovel and pickaxe will suffice.
- 3) Levelling device / spirit level for measuring / checking the excavation base.
- 4) Pipe sleeves, elbows and connectors in sufficient dimensions and quantities to connect the individual channel sections to each other and to the infiltration system.
- 5) Other small tools (cutter knife, folding rule, etc.)



For a fast and exact filling, we recommend the MEACLEAN PRO level-off gauge set. For both layers, it contains a matching level-off gauge.

# FILLING IN THE SUBSTRATE

After proper mounting of the MEACLEAN PRO channel elements (see previous diagram of the different loading classes) and compliance with all required drying times in accordance with the manufacturer's instructions for the materials used, the MEACLEAN PRO drainage channel is to be filled with the various substrates.

To do this, place the prefabricated perforated plates covered with filter fabric in the assembled channel elements (if necessary, shorten the start or end plate). The protruding ends of the filter fabric must lie in full length on the previous perforated plate to ensure an appropriate overlap.

First fill in Biocalith K (white granulate) until it is approx. 3 cm above the upper edge of the perforated plate. Check this at several points (but at least every 5 m).

Immediately after this, a layer thickness of 17 cm of the top layer of Biocalith MR-F1 substrate is to be applied. This should be done carefully with a suitable tool in order not to destroy the first substrate layer and to avoid mixing of the materials as far as possible.



**Step 1:**  
Insertion of the spacers covered with geotextile in the laid down gutter strands



**Step 2:**  
Fill in and level-off the first substrate layer "Biocalith K".



**Step 3:**  
Filling in and level-off the second substrate layer "Biocalith MR-F1" with the use of the MEA level-off gauge.



**Step 4:**  
Covering the channel strands with MEA gratings



# I MOUNTING / DISASSEMBLY

## THE CLIPFIX GRATES

### MOUNTING THE CLIPFIX GRATINGS



#### Step 1:

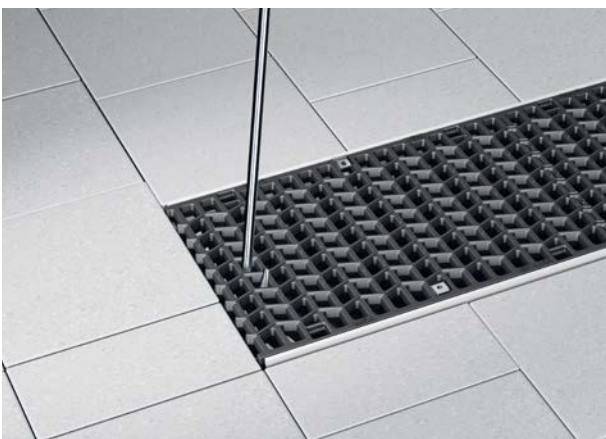
Place the die-cast grate straight and evenly on the drainage channel body so that the quick-release fastener shown lies above the opening provided for it, and press it evenly into the channel body without tilting until the locking system audibly engages.



#### Step 2:

Check the fixation for durability by cross-checking (pulling) to ensure that the grates are firmly anchored in the locking points.

### DISASSEMBLY OF THE CLIPFIX GRATINGS



#### Step 1:

Attachment of the MEA grate hook to the grate joint.



#### Step 2:

Lifting the grate with the MEA grate hook.



## MEACLEAN PRO SEEPAGE

The MEACLEAN PRO filter channel system can be optimally combined with our seepage boxes (including Geotextile) and the associated system components. Supplemented with pre-filters and attachments for aeration and ventilation, or as an emergency overflow, the system is versatile in its application. The seepage box is covered with a Geotextile to protect it from being washed in from the soil.

Due to its high load-bearing capacity and fast, simple mounting, the MEA seepage system can be used both in parks, industrial areas and around the house. The entire seepage system is available in various sizes and is pre-assembled ready for installation.





## MEACLEAN PRO

### SUSTAINABLE RAIN WATER MANAGEMENT

The MEASTORM chamber was especially designed for the area of rainwater infiltration. By combining it with the MEACLEAN PRO filter channel system, the filtered rain water can be seeped away directly on site. MEA thus offers a smart and uncomplicated solution for groundwater protection. This decentralised seepage solution is not only economical and environmentally friendly, but also low-maintenance and extremely resilient.

The MEASTORM stormwater management system protects existing sewer systems from overloading, minimizes sewer construction costs and flood control expenses. The rain water is seeped away decentrally.











# MEACLEAN PRO CARE AND MAINTENANCE

According to DIBT, the functionality and filter performance of the substrates must be verified every 10 years. This specification is independent of the manufacturer.

The specified service life of the substrates is more than 25 years. The interval for any necessary cleaning of the upper substrate layer within the channel depends on the installation location. The so-called filter cake that may develop over time does not affect the cleaning performance of the substrate. However, it has a direct influence on the discharge capacity/seepage velocity. By placing a Geotextile on

the top substrate layer, cleaning is considerably simplified. The Geotextile can simply be removed together with the dirt deposits during the cleaning interval. Another cleaning option is to remove the dirt with the appropriate MEACLEAN PRO level-off gauge.

If these values deteriorate significantly (for example, the channel overflows during normal rainfall), then this filter must be removed together with a small part of the upper substrate layer and replaced with new substrate. Subsequently, the prescribed layer thickness substrate must be restored.







URBAN AREAS

# IMEACLEAN PRO

## APPLICATION AREAS



NEW CONSTRUCTIONS



FLOOD HAZARD AREAS



HOME AND GARDEN





OPEN SPACE DRAINAGE



GARDENING AND LANDSCAPING





**BUILDING SUCCESS**

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Business unit MEA Water Management