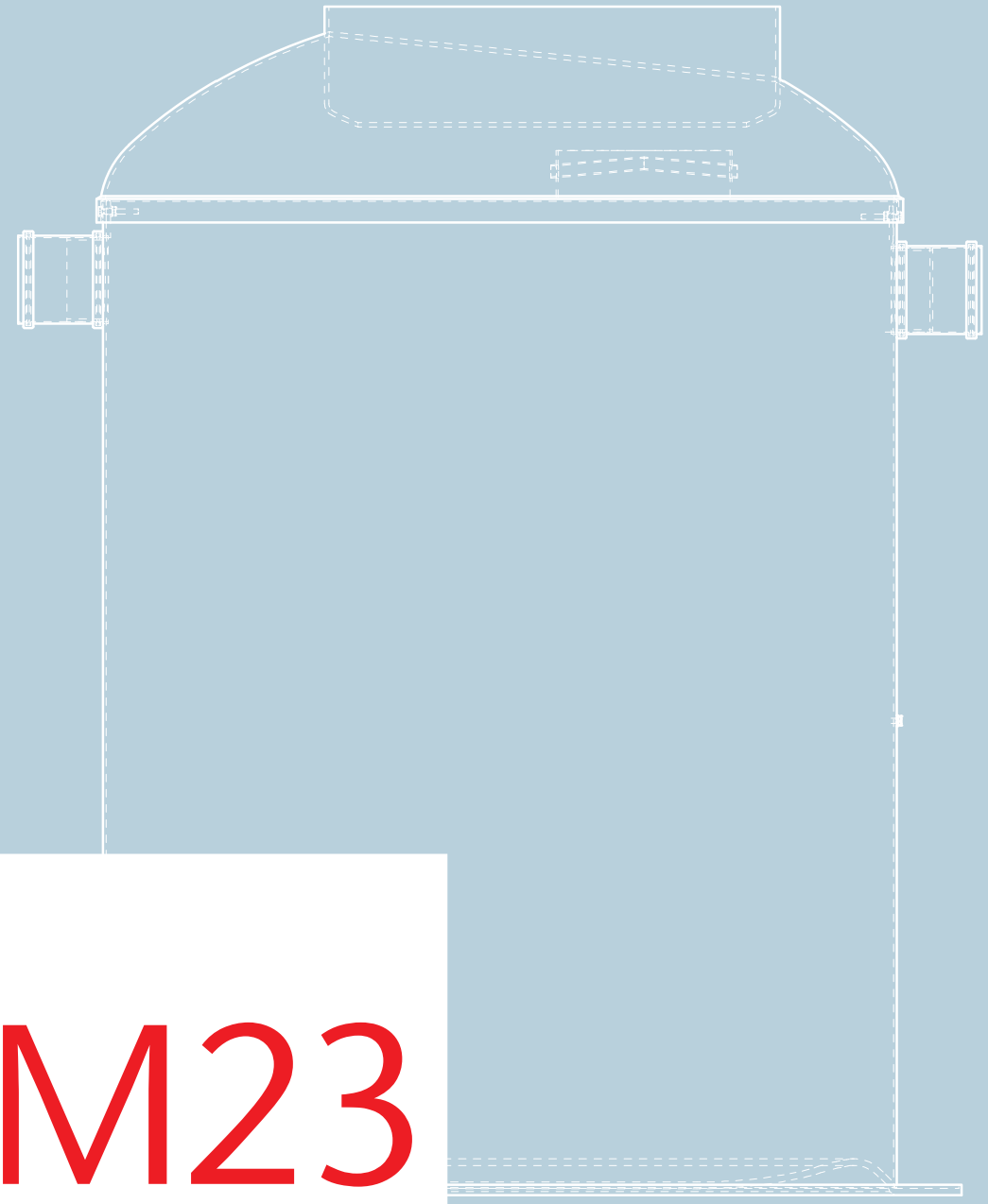


IM23

Installation Manual

ACO Oleopator G, Oleopator Bypass G, Oleosmart G , Lipumax G, Stormsed Vortex G, Stormclean G, Sludge Trap G, Sedismart G

Note

- This manual is for the ACO prefabricated Oleopator G, Oleopator Bypass G, Oleosmart G , Lipumax G, Stormsed Vortex G, Stormclean G, Sludge Trap G, Sedismart G – read this manual before installing one of the products.
- This manual should be used when installing the Oleopator G, Oleopator Bypass G, Oleosmart G, Lipumax G, Stormsed Vortex G, Stormclean G, Sludge Trap G, Sedismart G and should be kept available at the workplace / installation site. Installation of the products must be performed by qualified installers.
- Provisions under applicable laws should be followed in order to prevent accidents and protect the environment.
- Proper installation of each product is crucial in order to maintain warranty, to get proper function and lifetime of the product, to prevent damage or failure of the product which could cause damage to the environment and also to ensure the safety of all involved during installation.

Terms and conditions

Any change or alteration made to these products by the consumer without ACO's specific approval will void all warranty obligations.

Note

Any more questions?
askACO – your local
ACO team is proud to offer
experience and service

**www.aco.com/en/
products-and-services/askaco**

ACO. we care for water

ACO is a Water-Tech company that protects water. Building on our global drainage expertise that protects people from water, we increasingly see our mission as also protecting water from people.

With the ACO WaterCycle, ACO provides systems that collect and channel, clean, retain and ultimately reuse water. In this way, ACO contributes to the preservation of clean groundwater as a vital resource, and makes a contribution to tomorrow's world. In its Agenda 2030, the UN global community set the improvement of water quality as one of 17 sustainable development goals.

Intelligent drainage systems from ACO increasingly use smart technology to ensure that rainwater and wastewater are drained, or temporarily stored. With innovative separation and filter technology, we prevent water contamination by pollutants such as fat and grease, fuels, heavy metals and microplastics.

Today, ACO goes one step further: we accept the challenge of reusing water, and thus establishing a resource-saving cycle. For all products and systems, ACO attaches great importance to durability, reusability and a low carbon footprint. The pursuit of sustainability is an ongoing process that we strive to meet every day.

The ACO Group is a global family business that is one of the world market leaders in the Water-Tech segment. Founded in Schleswig-Holstein in 1946, it operates as a transnational network in over 50 countries. Worldwide, ACO is characterised by a high level of decentralised ownership, and explicit regional market proximity.

www.aco.com

Holder
Iver and Hans-Julius Ahlmann

Headquarters of the ACO Group
in Rendsburg/Büdelsdorf

5.200

employees in more than 47 countries (Europe, North and South America, Asia, Australia, Africa)

1 Billion

Euro Sales in 2021

37

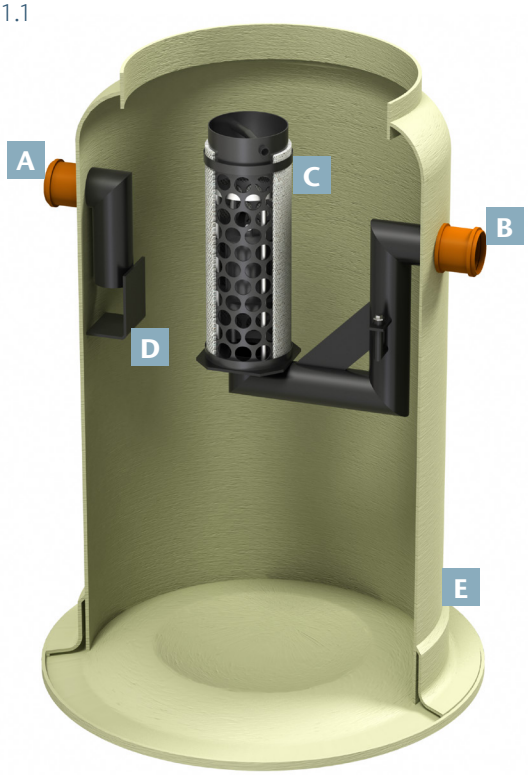
production sites in 18 countries

ACO Academy
for practical training

1 Structure and components

ACO Oleopator G

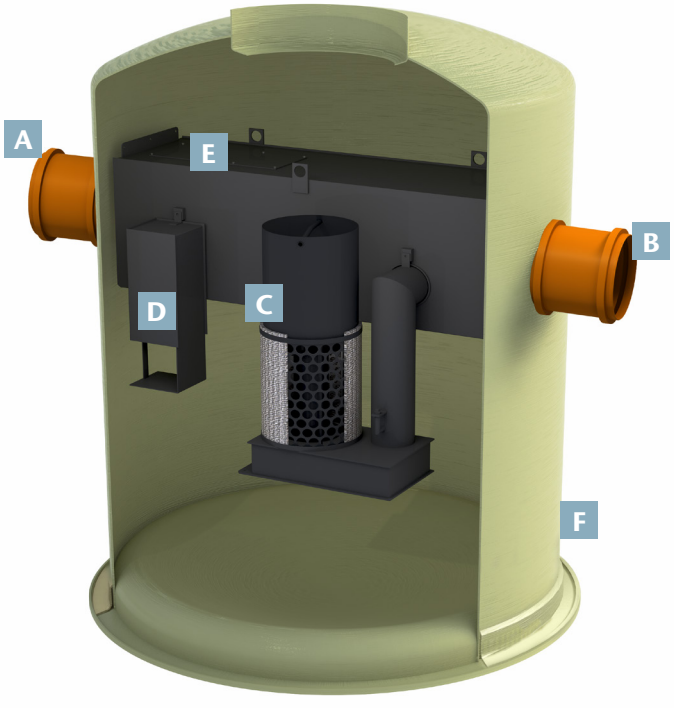
Figure 1.1



- A Inlet
- B Outlet
- C Coalescence unit with closing device (float)
- D Inlet inner part with distribution baffle
- E GRP vertical tank

ACO Oleopator Bypass G

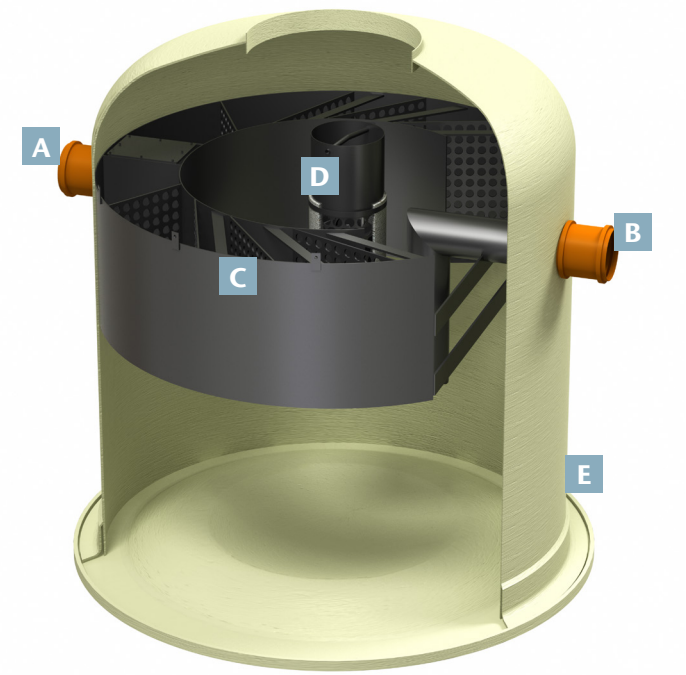
Figure 1.2



- A Inlet
- B Outlet
- C Coalescence unit with closing device (float)
- D Inlet inner part with distribution baffle
- E Integrated inner bypass
- F GRP vertical tank

ACO Oleosmart G

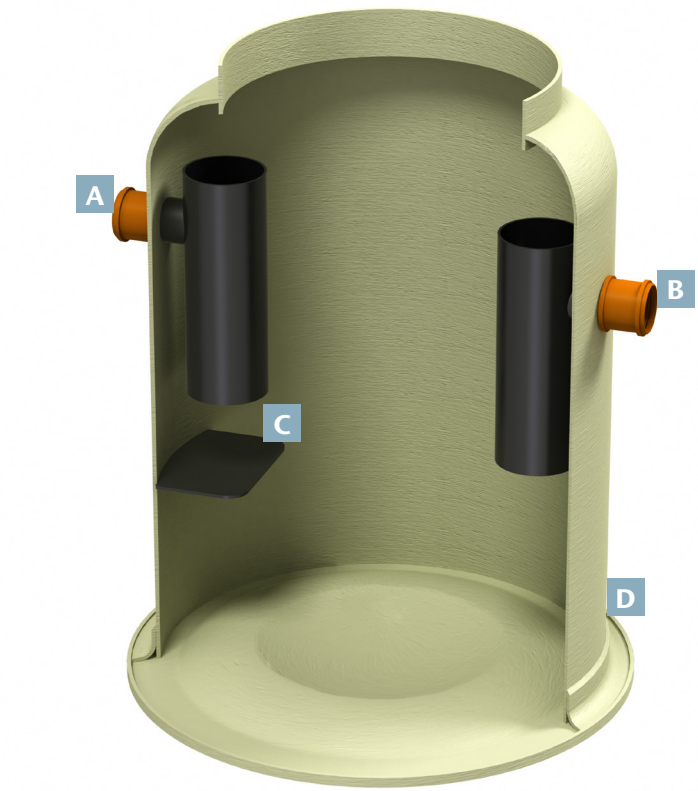
Figure 1.3



- A Inlet
- B Outlet
- C Coalescence channel
- D Closing device (float)
- E GRP vertical tank

ACO Lipumax G

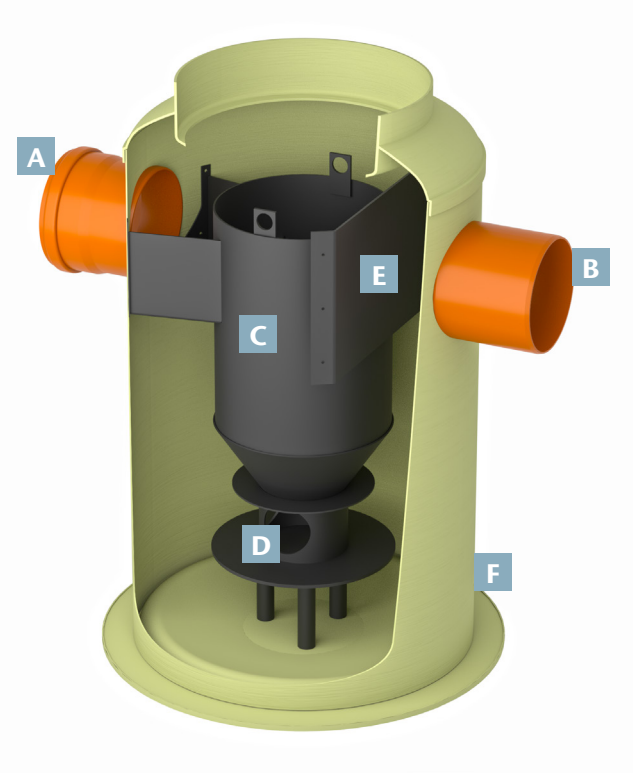
Figure 1.4



- A Inlet
- B Outlet
- C Distribution baffle
- D GRP vertical tank

ACO Stormsed Vortex G

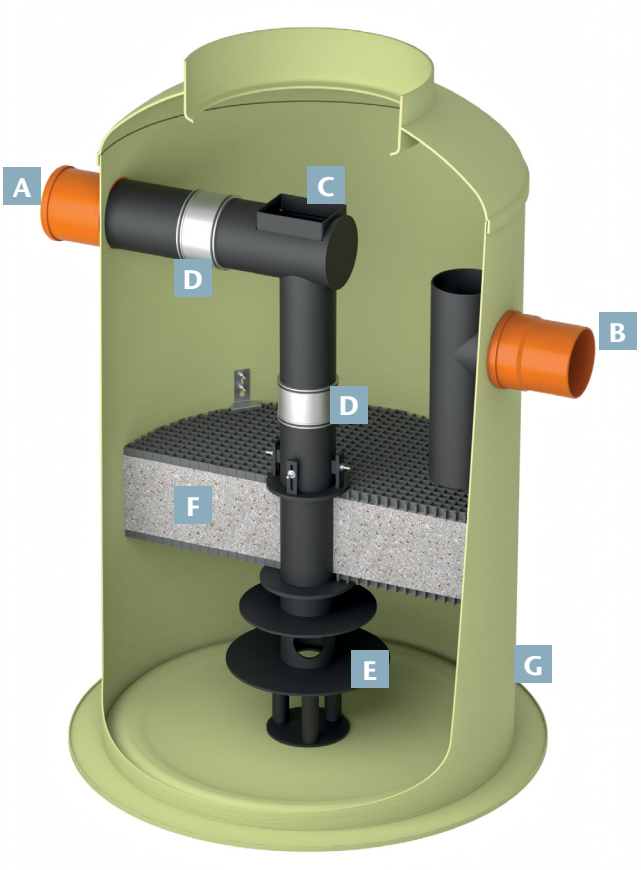
Figure 1.5



- A Inlet
- B Outlet
- C Vortex chamber
- D Sediment distribution unit
- E Baffle
- F GRP vertical tank

ACO Stormclean G – international version

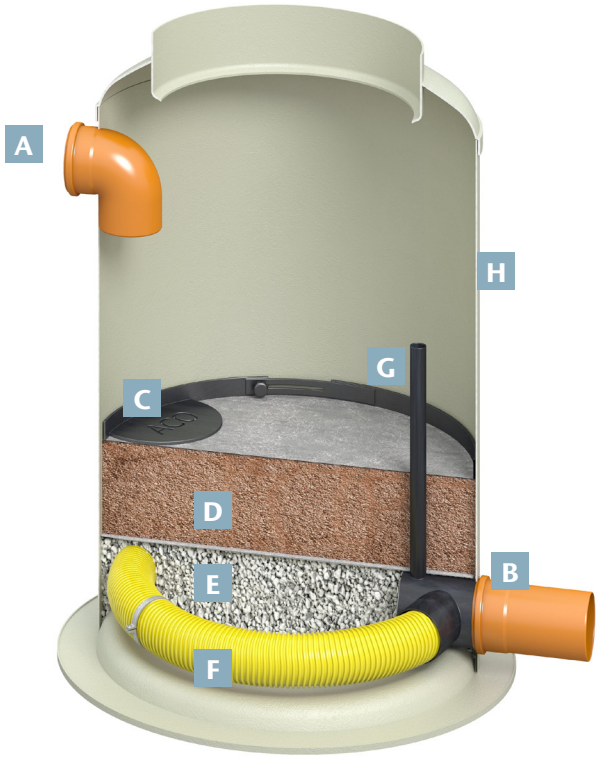
Figure 1.6



- A Inlet
- B Outlet
- C Integrated bypass
- D Flexible pipe couplings
- E Sedimentation and distribution unit
- F Loose filter bed
- G GRP vertical tank

ACO Stormclean G – Austrian version

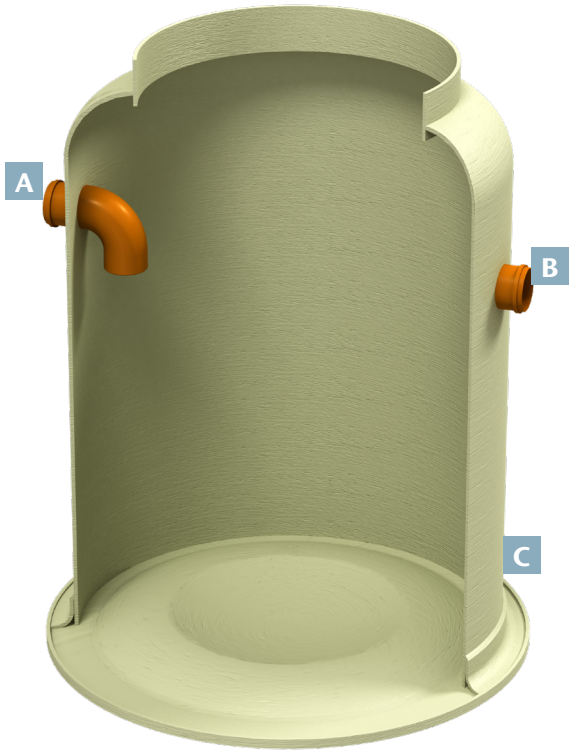
Figure 1.7



- A Inlet
- B Outlet
- C Flow distribution plate
- D Loose filter bed
- E Gravel Bed
- F Perforated pipe connected to the outlet pipe
- G Overflow pipe
- H GRP tank

ACO Sludge Trap G

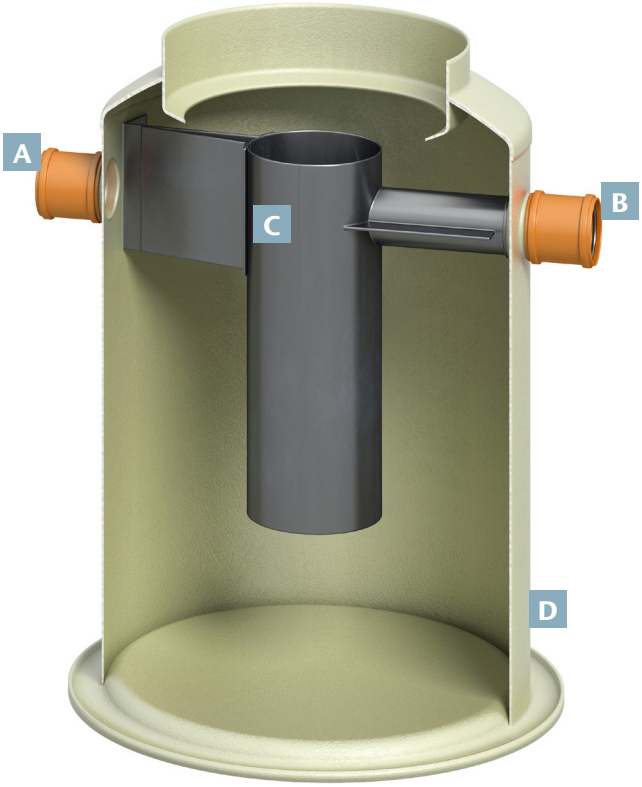
Figure 1.8



- A Inlet
- B Outlet
- C GRP vertical tank

ACO Sedismart G

Figure 1.9



- A Inlet
- B Outlet
- C Inner part for optimised sedimentation
- D GRP vertical tank

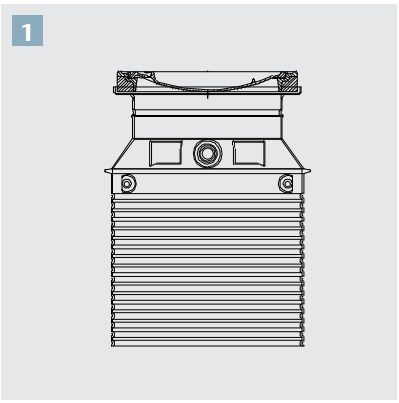
2 Top sections types

Note: Top sections come in different heights and therefore the drawings might be different from the height you have ordered.

Top sections with standard covers

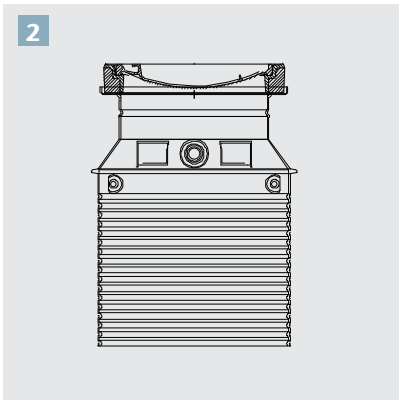
DN 600

Load Class A



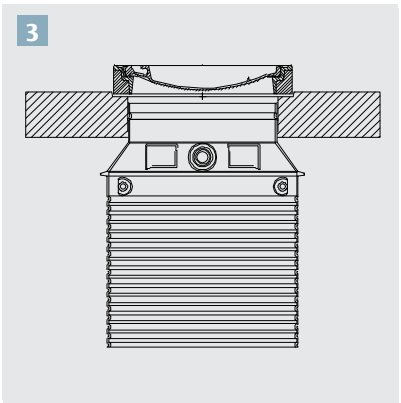
1 DN 600 load class A

Load Class B



2 DN 600 load class B

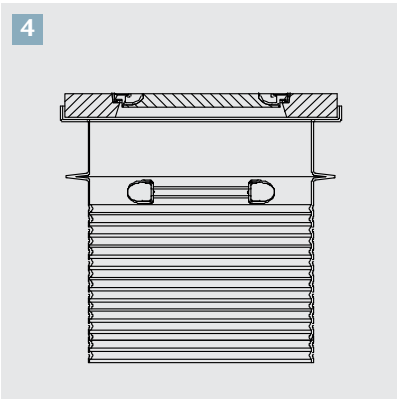
Load Class D



3 DN 600 load class D
(with load distribution ring)

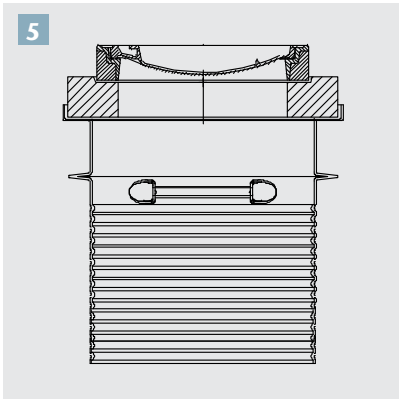
DN 800

Load Class A

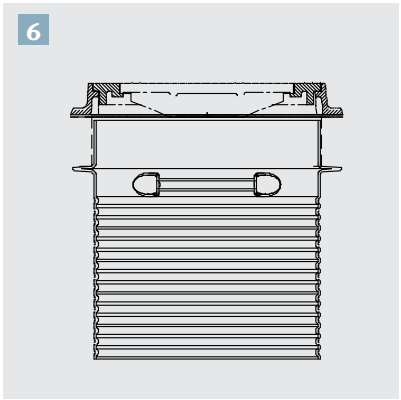


4 DN 800 (manhole cover DN 600) load class A

Load Class B

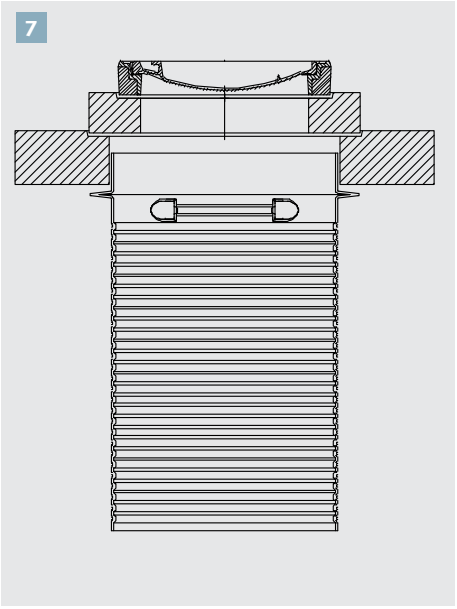


5 DN 800 (manhole cover DN 600) load class B

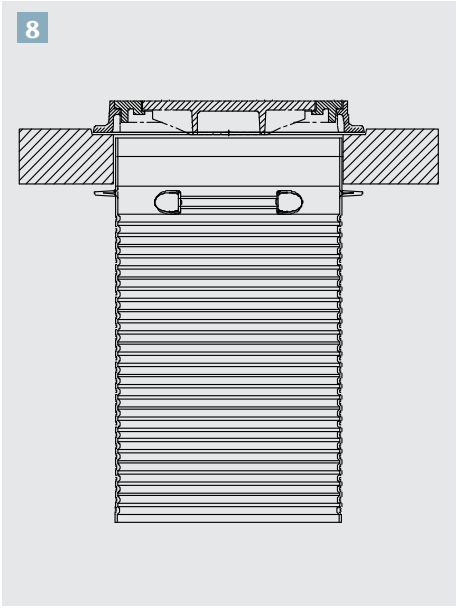


6 DN 800 (manhole cover DN 800) load class B

Load Class D



7 DN 800 (manhole cover DN 600)
load class D
(with load distribution ring)

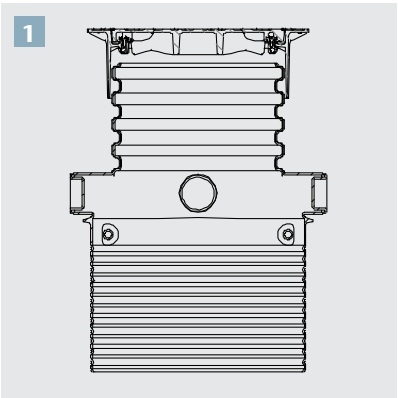


8 DN 800 (manhole cover DN 800)
load class D
(with load distribution ring)

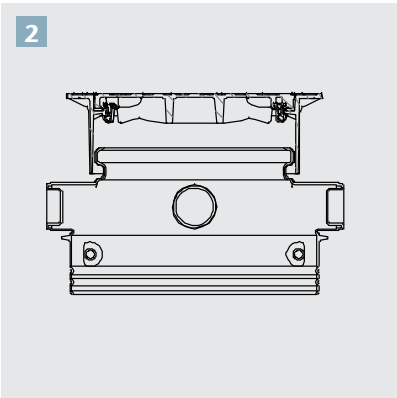
2.2 Top sections with floating covers

DN 600

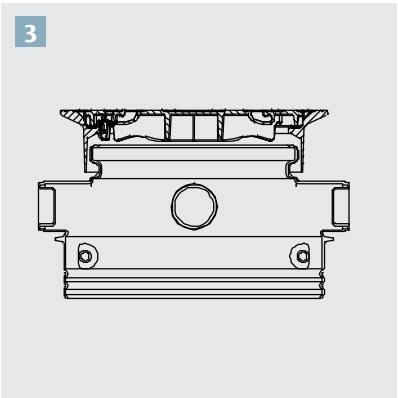
Load Class B



1 DN 600 load class B
with floating cover

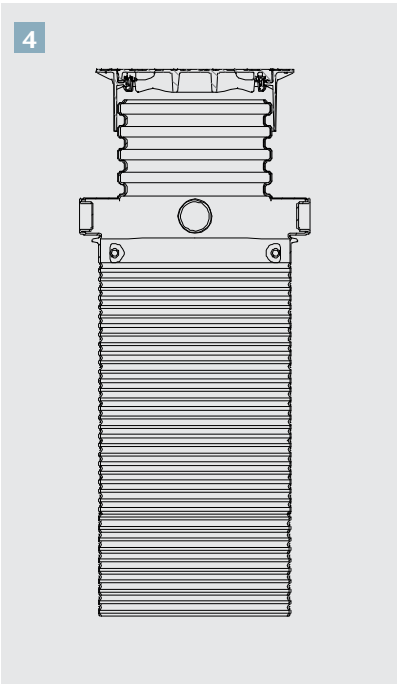


2 DN 600 load class B
with floating cover



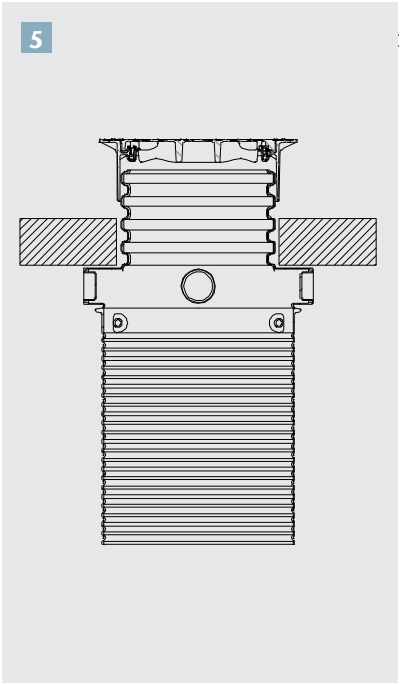
3 DN 600 load class B
with short floating cover

Load Class B

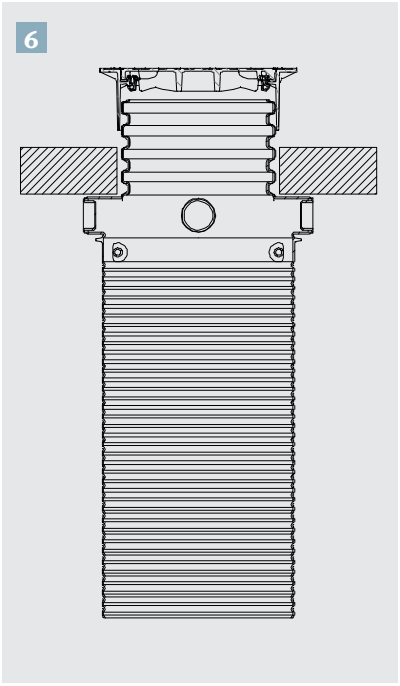


4 DN 600 load class B with floating cover, extended version

Load Class D



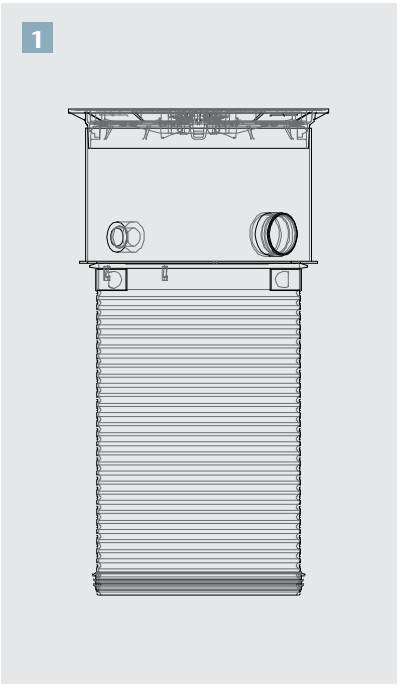
5 DN 600 load class D (with load distribution ring) with floating cover



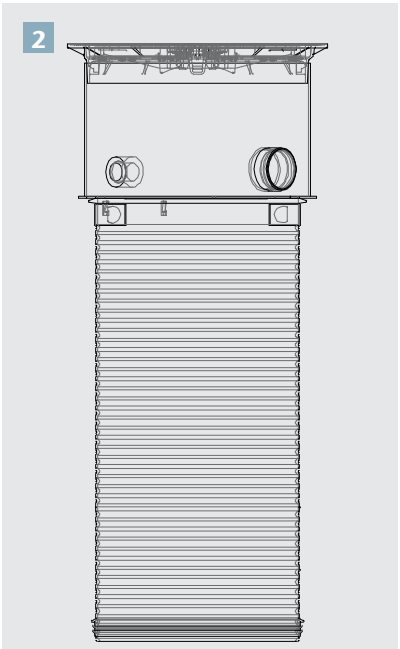
6 DN 600 load class D (with load distribution ring) with floating cover, extended version

DN 800

Load Class B

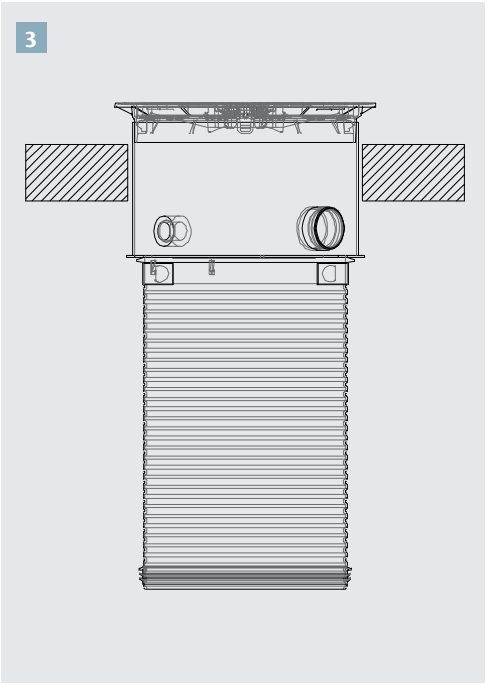


1 DN 800 (manhole cover DN 800) load class B with floating cover

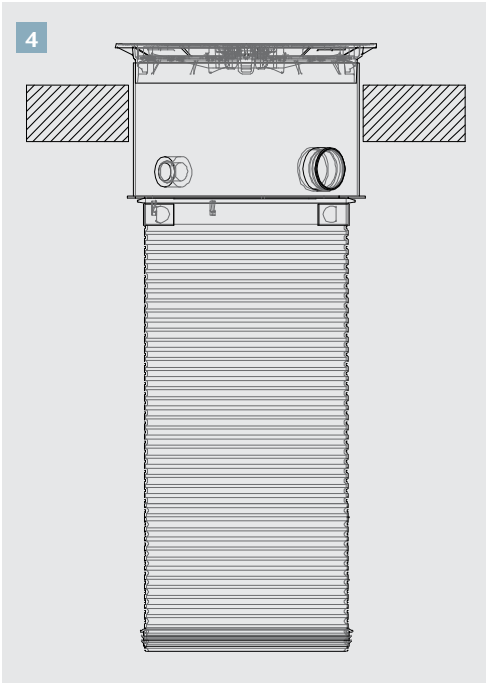


2 DN 800 (manhole cover DN 800) load class B with floating cover, extended version

Load Class D



3 DN 800 (manhole cover DN 800) load class D (with load distribution ring) with floating cover



4 DN 800 (manhole cover DN 800) load class D (with load distribution ring) with floating cover, extended version

3 General information

Application

- **Oleopator G, Oleopator Bypass G** and **Oleosmart G** are designed to treat oily wastewater and stormwater where high removal efficiencies are needed.
- **Lipumax G** is designed to remove fats, oils and grease from wastewater created by the food instustry (caterers, restaurants, snack bars, bakeries, etc).
- **Stormsed Vortex G** uses vortex separation to remove gravel, grit, sand and coarse sediment from stormwater, and associated bound pollutants.
- **Stormclean G** uses filtration to remove grit, sand, and coarse and fine sediment from stormwater. In addition, it captures residual mineral oil and dissolved pollutants such as heavy metals (copper, zinc and lead) and phosphorous, commonly found in stormwater.
- **Sludge Trap G** and **Sedismart G** remove gravel, grit, sand and coarse sediment from stormwater, and associated bound pollutants.
- Use of these products for other purposes is prohibited. The manufacturer is not liable for any damages caused by misuse. Responsibility falls entirely upon the operator.

Terms and conditions

- Compliance with national laws and regulations;
- Compliance with all inspection and service instructions;
- Adherence to the manufacturer's installation, operation and maintenance instructions.

Staff

Personnel who perform the installation, operation, maintenance and servicing of these products must possess the training needed to do these tasks and must understand the content of this manual.

Maintenance log

A record of activites performed on installed products should be kept, and include the following:

- Checks carried out by operational staff;
- Service and test reports;
- Any breakdowns and repairs.

Technical amendments

ACO reserves the right to make ongoing technical modifications which may result in differences between published text and/or images, and the products.

Product description

- All these products are designed for installation in the ground.
- These products come with integrated inlet and outlet connections and with compatible top section.
- In order to ensure proper overall function, use top sections from ACO which are compatible with ACO products.
- ACO is not responsible for possible problems caused by using non-ACO top sections. In case of using other solution for top section, contact ACO for consultation.

Function

- **Oleopator G**, **Oleopator Bypass G** and **Oleosmart G** light oil separators work through gravity separation.Sludge and heavier particles sink to the bottom, while light oil which is lighter than water rises to the surface. Treated water flows out.
- **Lipumax G** works on the gravity separation. Sludge and heavier particles sink to the bottom, while grease which is lighter than water rises to the surface. Treated water flows out.
- **Stormsed Vortex G** uses vortex and gravity separation to remove sediment. Sludge and heavier particles are separated on the bottom and the treated water flows out through the outlet.
- **Stormclean G** uses a reactive filter to capture both sediment and dissolved pollutants.
- **Sludge Trap G** and **Sedismart G** work on gravimetric principle. Sludge and heavier particles sink to the bottom. The treated water flows out through the outlet.

Flexible application (according to EN 124)

Load class		Description
EN 124		
A 15		Footways and areas accessible only to pedestrians and bicycles
B 125		Footways that can be mounted by light vehicles or livestock
D 400		Roads and highways and areas open to commercial vehicles

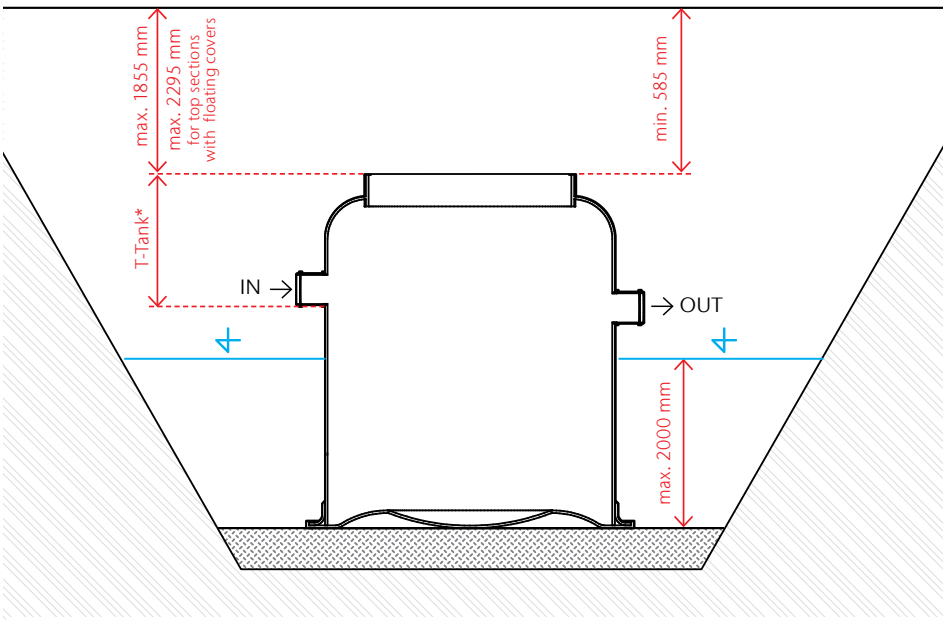
4 General installation information

- The maximum installation depth for the top sections with standard covers is 1855 mm (2295 mm for the top sections with floating covers) from the GRP collar as indicated on the figure 4.1. Note that also a minimum depth of 585 mm from the GRP collar must be ensured for the load class B125 and D400! In case of load class A15, the minimum depth of the GRP collar is according to the minimum possible length of your top section type.

- You can calculate the inlet depth as the depth of the GRP collar from the surface + the dimension T-Tank which is the depth of the bottom of the inlet from the GRP collar as indicated on the figure 4.1. The dimension T-Tank is different for each product (see catalogue data for your product).

- These products are designed to withstand a max. ground water level of 2000 mm from the tank bottom – this level must never be exceeded by any means! **Be aware that both surface infiltration and rainwater contribute to ground water levels**. See figure 4.1.

Figure 4.1 General installation information



*Dimension T-Tank according to catalogue data of your product.

Soil

Gravel 8/16 mm

- Do not install tank on slopes.
- Do not install on the clayey subsoil.
- The native subsoil must be stable and permeable enough (so the infiltrated water will not cause ground water level higher than the maximum allowed - 2000 mm from the tank bottom).
- Install the tank at sufficient distance from nearby structures so their statics are not affected by the construction works.
- When handling tanks, make sure all the equipment and machinery is rated to handle the load.
- Maximum load class D 400 (with proper installation according to D 400 installation procedure).
- Do not install the tank in flood risk areas (max ground water level up to 2000 mm from the tank bottom must be ensured).
- Ensure no traffic above the tank during installation process! When the installation process is completed, allow only appropriate traffic (loads according to your load class type of installation).
- The following Unified Soil Classification System (USCS) soil types are suitable as backfilling material: GM, GP, GW, SM, SP, SW.
- If the soil on site is not suitable for backfilling, use gravel (fraction 8 mm – 16 mm) as backfilling material.
- If native soil is used as a backfill material, ensure the immediate area (300 mm laterally) around the tank and top section contains no particles larger than 16 mm. Make sure there are no objects in the backfill material which could cause damage to the tank.
- Ensure non-freezing depth of the installed products to prevent the water inside the products from freezing.
- In case you have any questions regarding the installation process or if something is not clear to you, contact ACO before installation!

Note: ACO also has solutions for the non-standard installations. In that case contact ACO.

5 Storing products on site

- Upon receipt of your product, check for any damage that may have occurred during transport.
- Before unloading and handling ensure the tank is empty.
- Store the tank on a suitable flat surface in vertical position. Make sure there are no sharp objects which could cause damage to the tank. Choose the storage location with care to avoid accidental damage to the tank.
- If the tank is stored for more than 6 weeks, the GRP tank must be protected from direct sunlight. If adequate protection is not provided, ACO is not responsible for any changes in the material properties of the GRP tank.
- Protect from prolonged sub-zero temperatures and temperatures above 25 °C.
- Do not allow heavy materials to be stacked on or against the GRP tank. Do not roll or drop the tank!
- Use appropriately rated machinery when handling and lifting products.
- In case the tank came in horizontal position use lifting lug to lift it to vertical position. If the tank has lifting lug with white rectangle sprayed around the lug, use only this marked lug to lift the tank from horizontal to vertical position. If your product does not have white marked lifting lug, use any of the integrated lifting lugs to lift the tank from horizontal to vertical position. Take care to lift the tank slowly and smoothly, and to avoid dynamic impacts. Once the tank is vertical, use the integrated lifting lugs to handle.

6 Compaction specification

Table 6.1 Compaction specification

Category		Where to use	Compaction layer thickness	Machinery specification
1	no compaction	■ up to 100 mm above the tank ■ up to 100 mm from the sides of the tank and top section		
2	only hand tamper compaction	■ between 100 – 300 mm above the tank ■ between 100 – 200 mm from the sides of the tank and top section	compact continuously	only hand tamper
3	light compaction machinery	■ between 300 – 700 mm above the tank ■ between 200 – 500 mm from the sides of the tank and top section	200 mm	light vibratory plate compactor (weight around 60 kg, impact force around 12 kN)
4	medium compaction machinery	■ between 700 – 1200 mm above the tank ■ between 500 – 1000 mm from the sides of the tank and top section	250 – 300 mm	vibratory plate compactor (weight 120 – 200 kg, impact force around 25 kN)
5	heavier compaction machinery	■ between 1200 – 2000 mm above the tank ■ between 1000 – 1300 mm from the sides of the tank and top section	250 – 300 mm	vibratory plate compactor (weight 200 – 350 kg, impact force around 40 kN)
6	heavy compaction machinery	■ from 2000 mm above the tank ■ from 1300 mm from the sides of the tank and top section	250 – 300 mm	non-vibratory roller (weight up to 1500 kg)

Note: Make sure no damage is done to the tank or top section during compaction works. When compacting near to the tank or top section, be careful and do not strike the products. Follow compaction machinery specification to ensure no damage is caused to the products. Do not use heavy vibration rollers.

Avoid any traffic above the products during installation. Installation must be complete before traffic appropriate to the chosen load class may be allowed. Traffic inappropriate to the chosen load class must not be allowed.

The mechanical properties of compacted soils are defined through the soil elastic modulus (Young's modulus E). To reach the soil elastic modulus values stated in this manual, compaction works must be carried out correctly.

7 Pit excavation and preparation before installing

General information on pit excavation

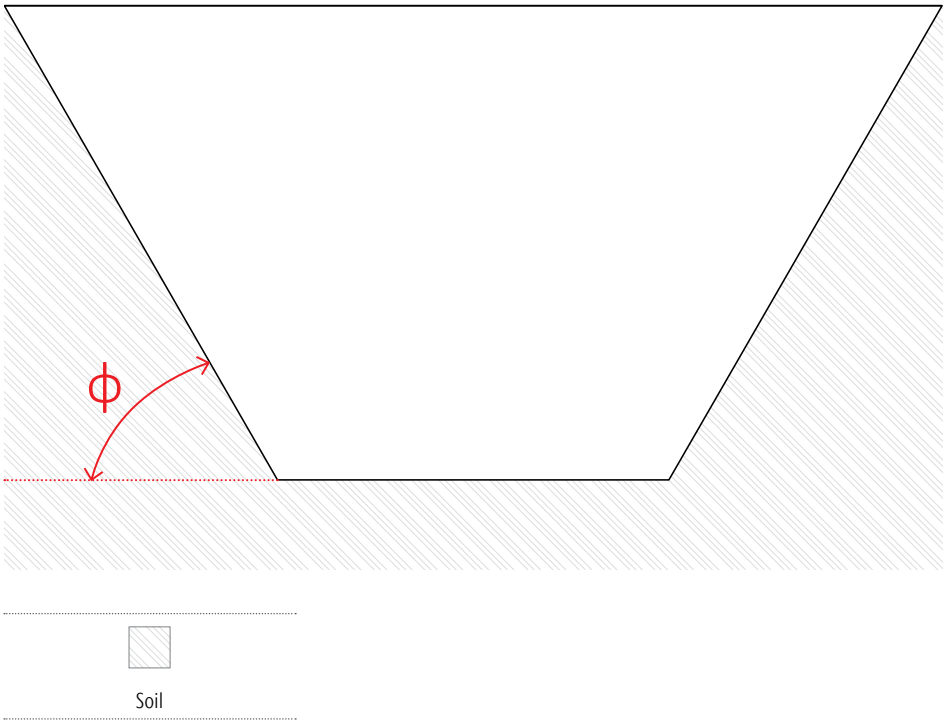
The following points should be considered during pit excavation:

- Take necessary safety precautions to ensure a safe working environment, and ensure all relevant local safety regulations are met.
- Prevent water penetration into the pit.
- Prepare the excavation pit according to all relevant local regulations, norms and standards.
- To ensure a flat base, remove all obstacles and sharp objects, such as rocks, gravel, concrete etc. from the pit.
- Remove all organic items, such as plants, tree roots etc. from the pit.
- Ensure strong and stable flat base.
- Ensure any water is removed (from the pit).
- Ensure the pit is wide enough to allow gravel bed and backfilling compaction works.
- To prevent excavated materials from falling back into the pit, they should be stored at a suitable distance from the pit edge.
- Pit depth should be defined for each installation!

Pit excavation and gravel bed preparation

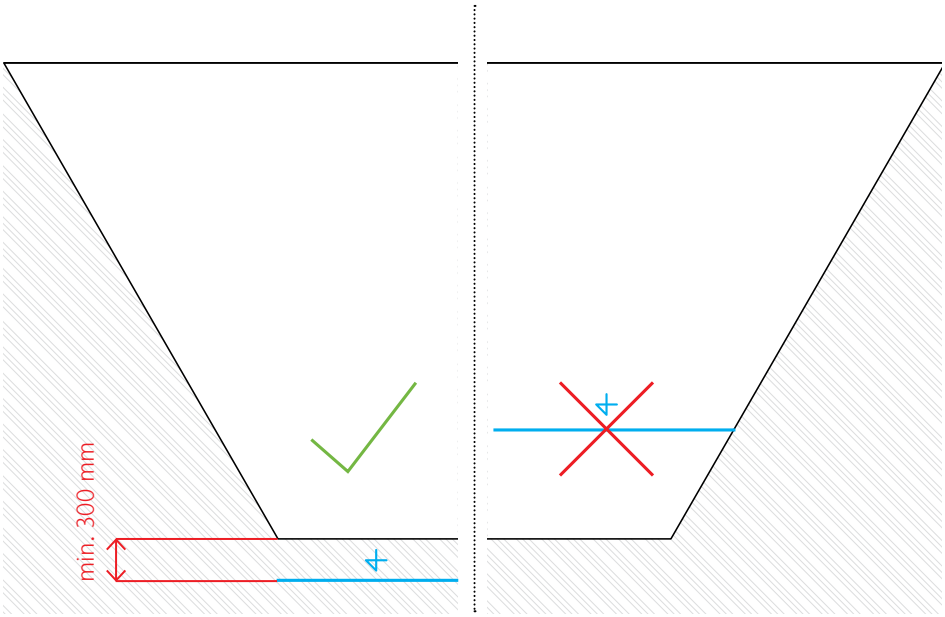
- During pit excavation follow all relevant local regulations, norms and standards (angle of the pit walls, sheeting type etc). If you are not sure about the proper pit wall angles, maintain max. angle of the pit walls on the value of Φ (soil internal friction angle) – see figure 7.1.

Figure 7.1 Angle of the pit walls



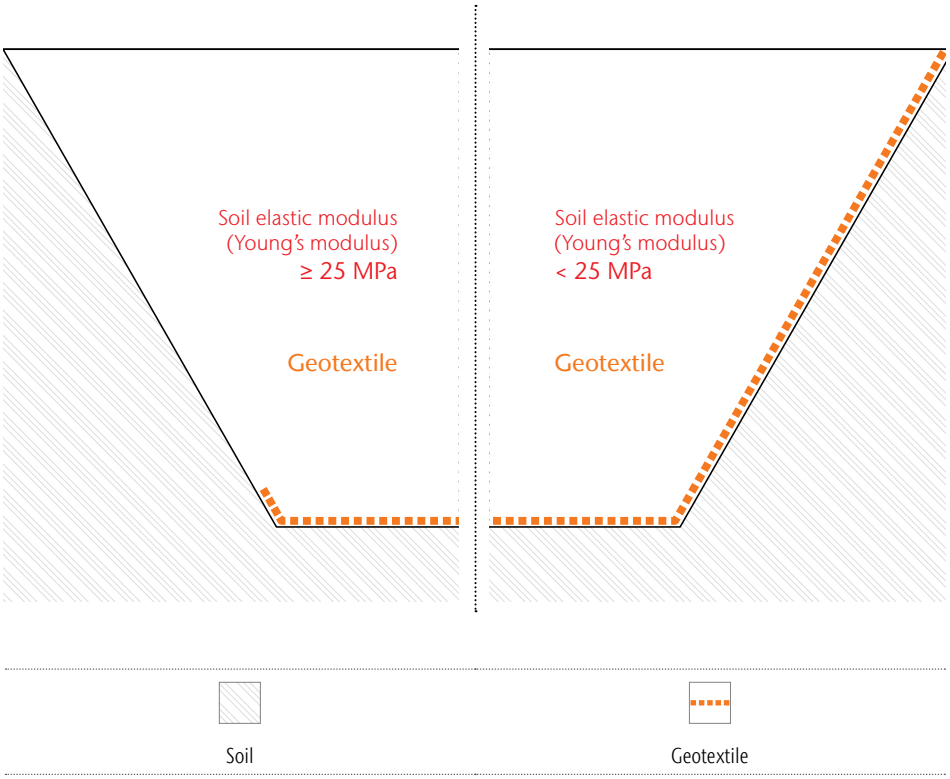
- Ensure dry bottom of the pit before preparation of the gravel bed (if the groundwater level is above the pit bottom, ensure proper drainage is installed to decrease the groundwater level to at least 300mm below the bottom of the pit).
- Maintain a dry excavation pit throughout the installation process. Beware of groundwater infiltration into the pit and also water from the surface (rainfall, etc.).

Figure 7.2 Ensure dry excavation pit



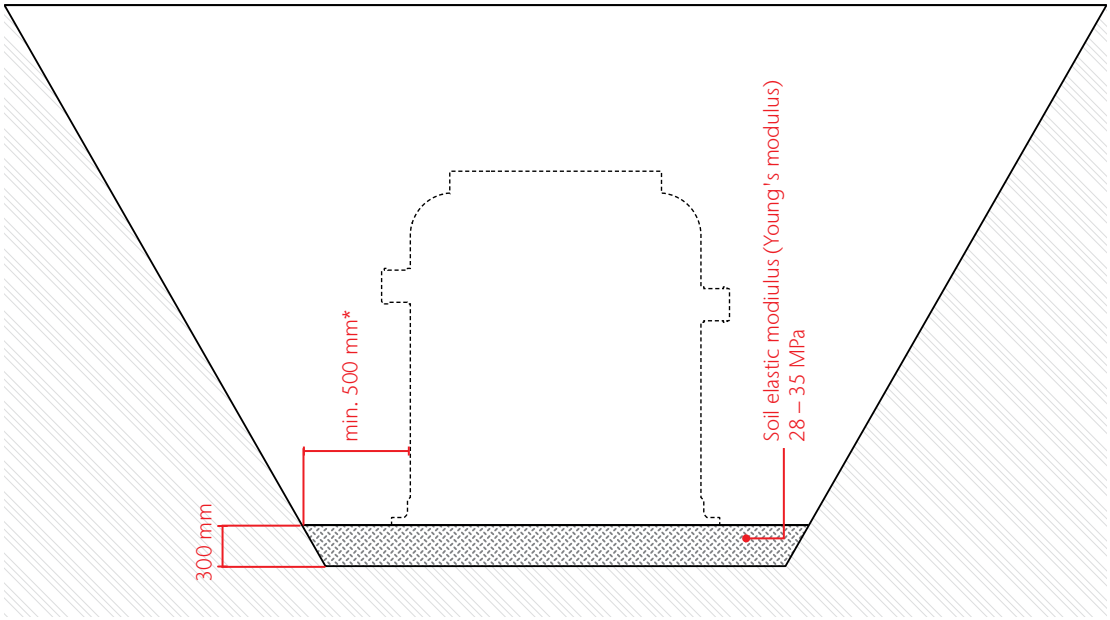
- If the subsoil (the bottom of the excavation pit) has a soil elastic modulus (Young's modulus) less than 25 MPa, place a non-woven geotextile (min. 250 g/m2) on both the bottom and sides of the excavation pit. If the bottom of the pit has a soil elastic modulus (Young's modulus) of 25 MPa or greater, only place the geotextile on the bottom of the excavation pit as indicated on the figure 7.3.

Figure 7.3 Geotextile usage according to properties of the excavation pit bottom.



- Prepare a level bed of compacted 8/16 gravel with a minimum depth of 300 mm. Where the soil elastic modulus (Young's modulus) is 28 – 35 MPa and the leveling tolerance is ± 5mm/m.
- No additional mounting of the tank is required. The design of the tank bottom prevents any issues arising due to buoyancy.
- Dimension of the pit: ensure enough space around the tank for proper compaction works (min. 500 mm).

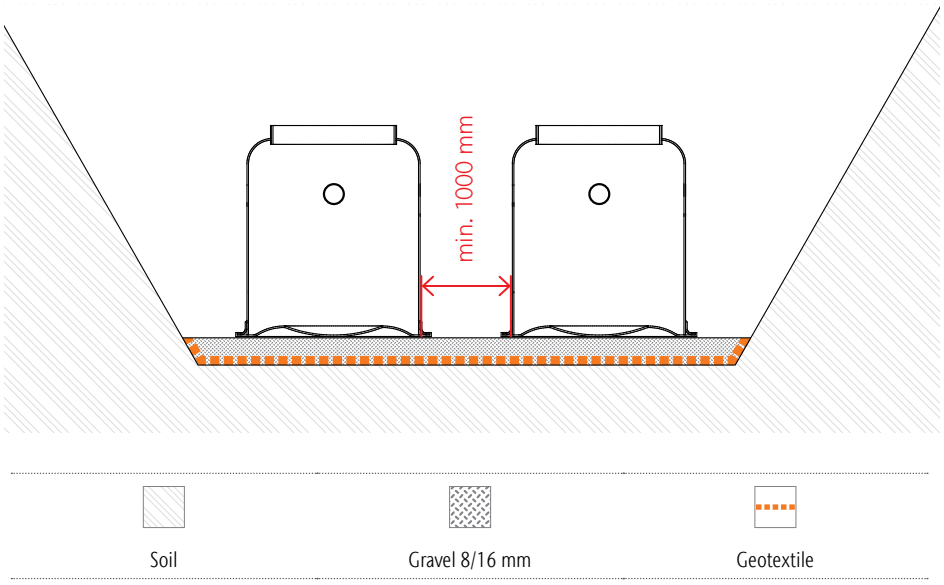
Figure 7.4 Dimension of the pit



*Ensure enough space around the tank for proper compaction works (min. 500 mm).

- If multiple tanks are being installed in a single excavation pit, ensure a minimum gap of 1000 mm between tanks.

Figure 7.5 Distance between tanks



8 Tank installation

- Use the integrated lifting lugs for handling. If lifting the tank from a horizontal to vertical position, ensure the lifting lug marked with a white rectangle is used. When lifting a tank, either a lifting beam or sling chain should be used. When using a sling chain, the number of chains used should match the number of lifting lugs on the product. Ensure that the maximum angle (figure 8.2) is not exceeded.
- Install the tank on the prepared compacted and leveled gravel bed. Do not place the tank directly on the excavation bottom without the gravel bed!
- When handling and lifting product(s), only use machinery with an appropriate load rating.
- Avoid uneven lifting and dragging along the ground. Never stand under the suspended load during handling! Prevent other persons from entering the entire danger zone!

- Follow the handling instructions! Improper handling could result in serious injury!

Figure 8.1 Lifting the tank up with lifting beam

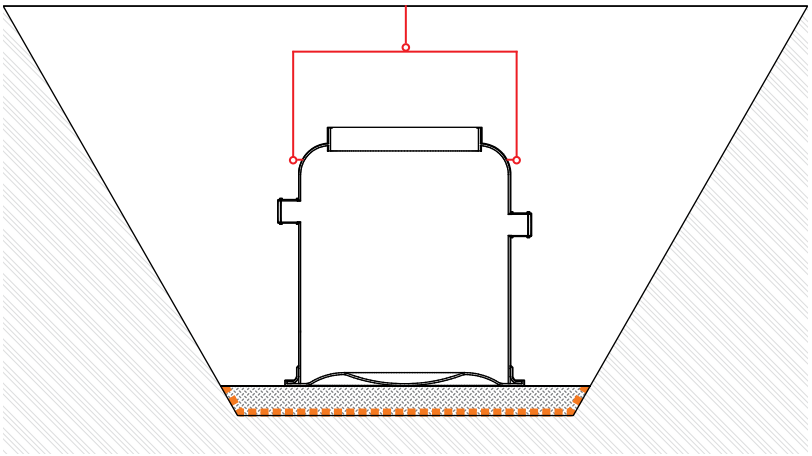
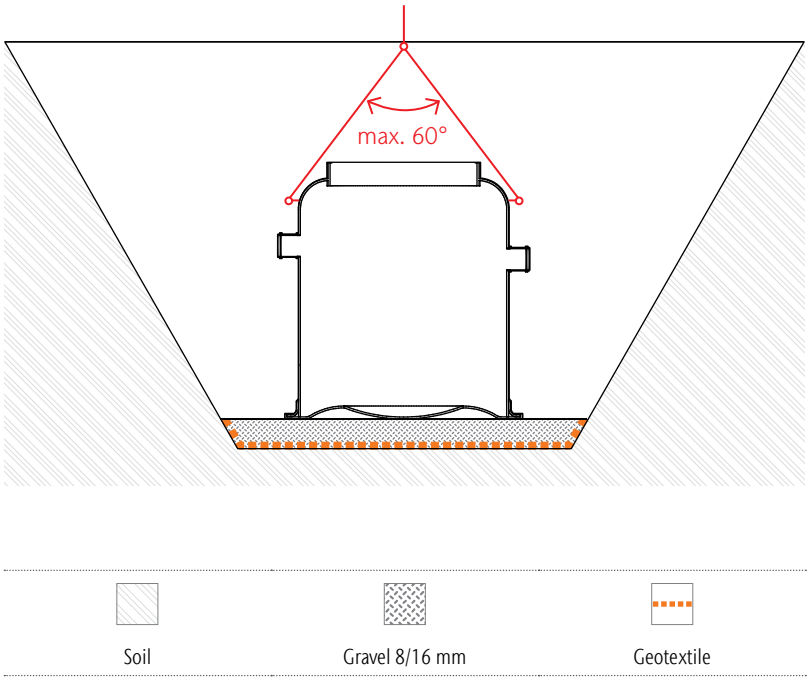


Figure 8.2 Lifting the tank up without the lifting beam



9 Backfilling

- The proper backfilling process regarding materials and compaction works is essential to maintain structural stability of the tank, to avoid damage and to ensure long term product performance.
- Improper backfilling may result in tank failure and void the warranty.
- Before backfilling, do a visual inspection of the tank. If no damage is found, note it and continue to follow these instructions. If damage is found, contact ACO.
- Used materials and installation methods must not cause any harmful deformations and damage to the tank and top section.
- Use only approved backfilling material mentioned in this installation manual. If the native soil on site does not meet the prescribed suitable backfilling soils, use 8/16 gravel as backfilling material. Allowable backfilling soils: GM, GP, GW, SM, SP, SW according to USCS (Unified Soil Classification System).
- In the case of light liquid separators (Oleopator G, Oleopator Bypass G and Oleosmart G) uncover the access holes of GRP tank and remove the float and coalescence unit from the separator before filling with water (return the coalescence unit and the float to the separator after complete filling with water). Do not expose an unprotected (foil covering removed) coalescence unit to sunlight. It will degrade the foam and may compromise performance! See figure 9.1
- In the case of light liquid separators (Oleopator G, Oleopator Bypass G and Oleosmart G) attach the sampling unit to the inner outlet part before filling up with water!
- Make sure no backfilling material enters the tank during the backfilling process! Close the openings during backfilling (open only for filling up with water).

Figure 9.1 Before filling with water

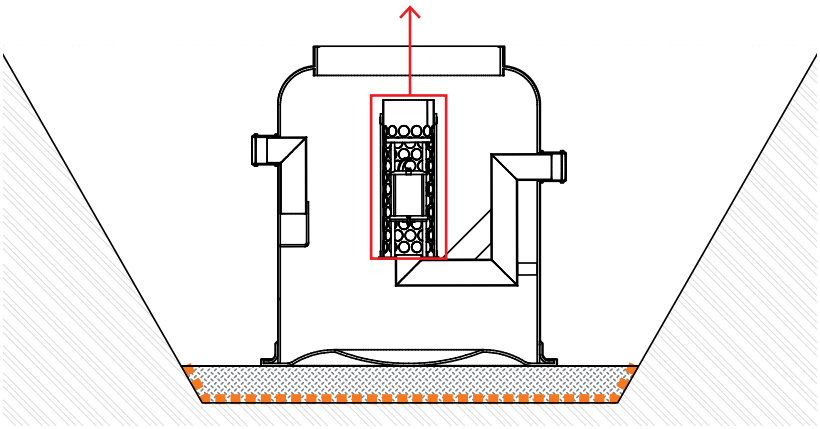
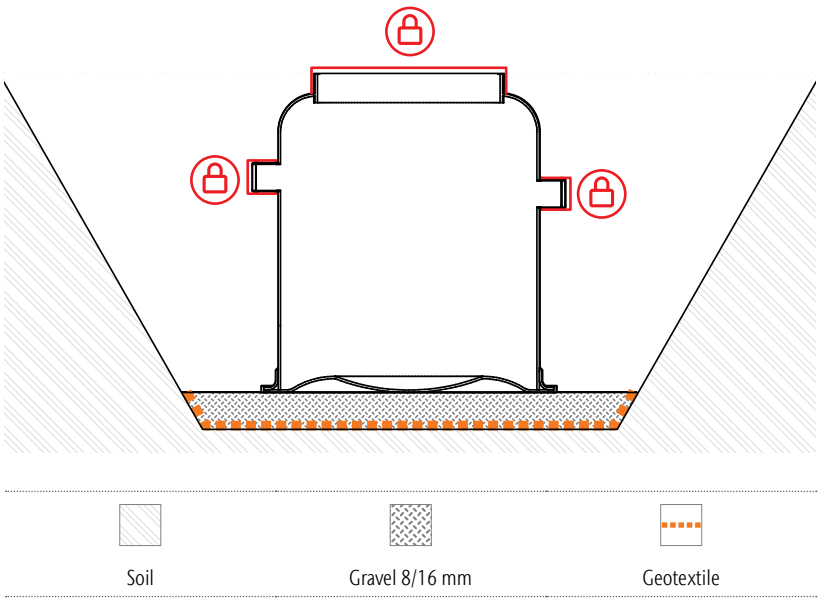


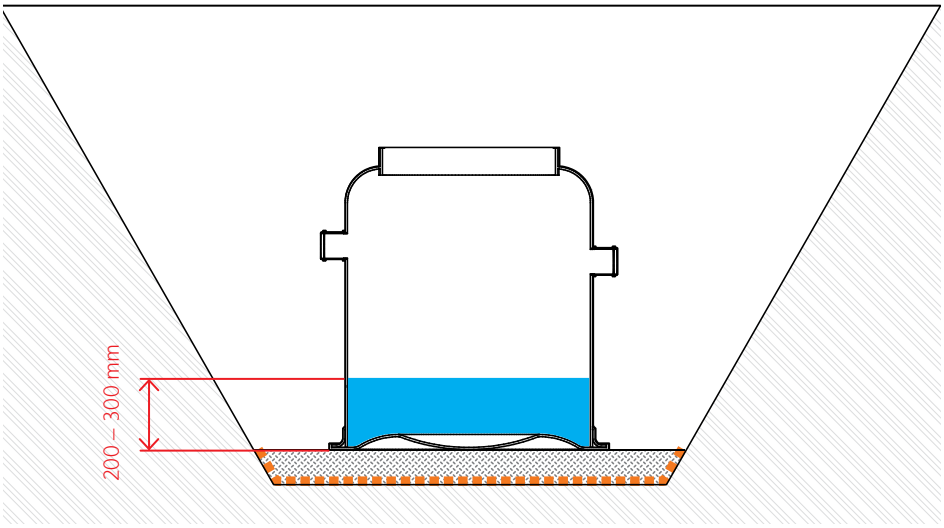
Figure 9.2 Closing the openings



- Fill the tank with water up to a level of 200 – 300 mm. After filling, the first layer of backfilling may be added. Compact to achieve a soil elastic modulus (Young's modulus) 28 – 35 MPa.

Note: Make sure the water in the product will not freeze during the installation.

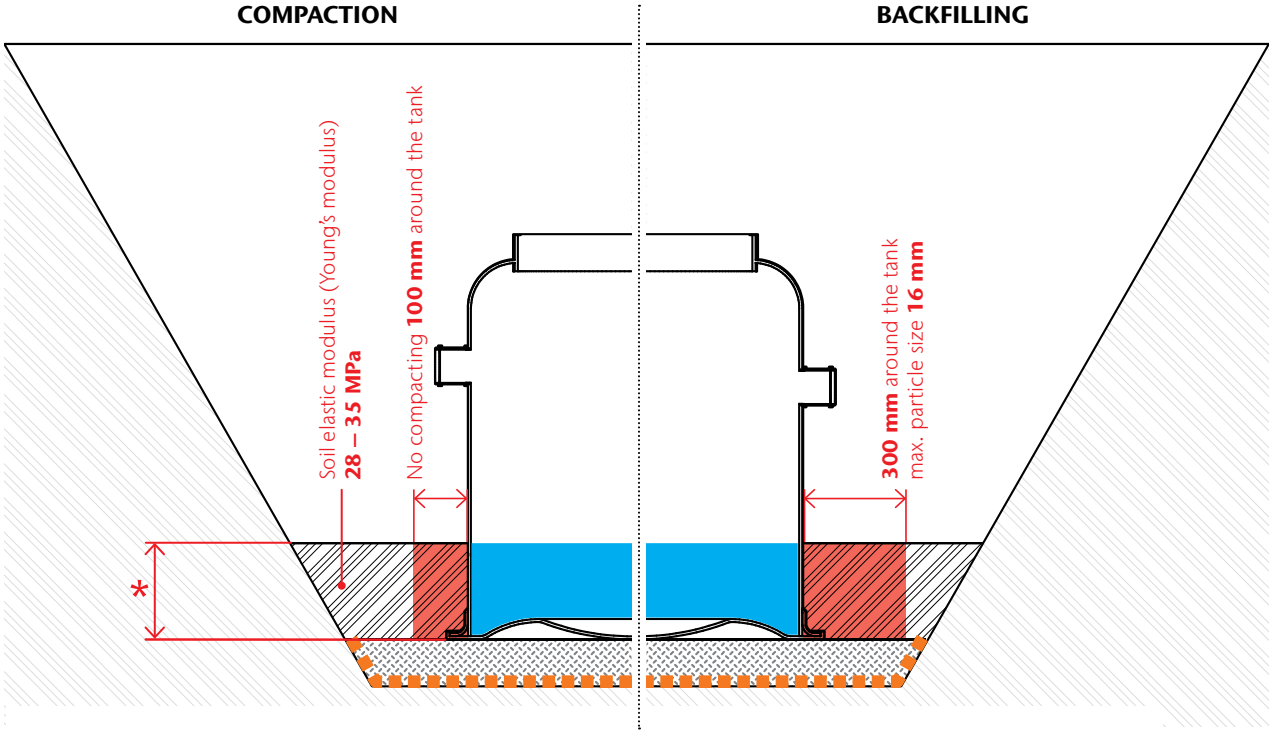
Figure 9.3 Initial filling of the tank with water up to 200 – 300 mm



- Follow instructions in section 6 (compaction specification) regarding the appropriate compaction machinery and proper thickness of layers for compacting. Up to the top of the tank achieve a soil elastic modulus (Young's modulus) of 28 – 35 MPa – see figure 9.4

- During the backfilling process always make sure to maintain the same level of water in the tank as the level of outer backfilling material up to the outlet pipe level.

Figure 9.4 Backfilling with gravel or native soil



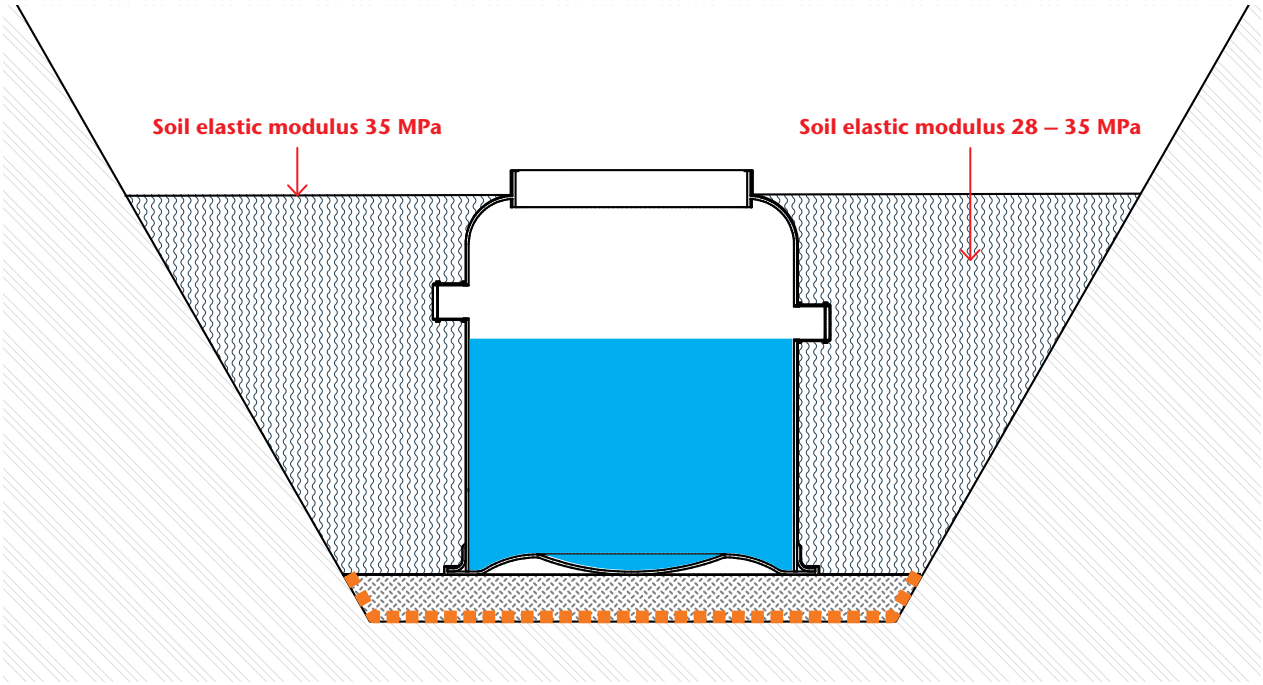
*Compaction layer thickness according to used compaction machinery (see chapter Compaction specification).

- If you use suitable native soil, ensure that the 300 mm immediately surrounding the tank and future top section does not contain particles larger than 16 mm, otherwise tank damage is possible. Make sure there are no objects in the native soil which could cause damage to the tank.

- When you get close to the inlet and outlet holes during backfilling process, connect the inlet and outlet pipes. For inlet and outlet pipe installation, follow the instructions given by the pipe supplier regarding the whole installation process (including compaction works).

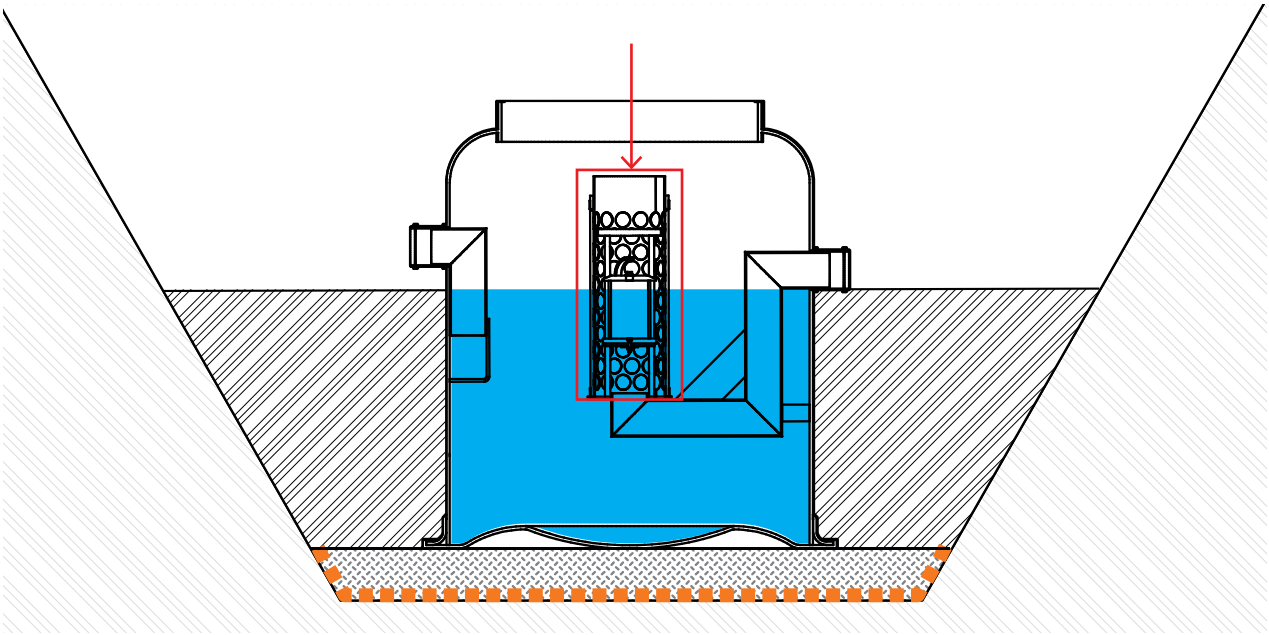
- Continue the backfilling process while properly compacting to get a soil elastic modulus (Young's modulus) of 28 – 35 MPa. At the top of the GRP tank the value of soil elastic modulus should be 35 MPa.

Figure 9.5 Backfill and compact properly to get soil elastic modulus (Young's modulus) 28 – 35 MPa



- In the case of light liquid separators (Oleopator G, Oleopator Bypass G and Oleosmart G), when the tank is filled with water up to the operating level, return the float and the coalescence unit back into separator. If there is protective foil on the coalescence unit remove it before returning back into the separator!

Figure 9.6 Return the float and the coalescence unit back into separator.



- When you are backfilling and compacting above the tank, follow the compaction specification – see section 6. Compaction specification.

10 Top section installation and backfilling

- Calculate the needed height of the top section H according to your type of top section in order to cut the top section properly.

Legend for dimensions

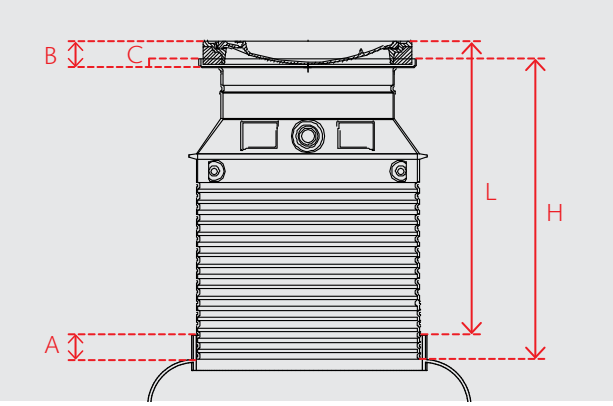
A	115 mm	The height of the top section which is inserted into the GRP neck
B		The height of your top cover type (in case you have reduction ring for DN 800 to DN 600 the length B is the height of the reduction ring and top cover together– count also with mortar bed thickness between reduction ring and top cover 10 mm)
C		The height of the top section's "collar" with consideration of the flat sealing 5 mm under the top cover (if it is relevant for your top section type), for DN 800 = 45 mm, for DN 600 = 22 mm
D		In case of top sections with floating covers this dimension is the height from the top of the top section up to the desired surface level
E		The gap between the top of the top section and the bottom of the top cover or reduction ring eventually
H		The desired height of the top section you need to get in order to cut the top section properly according to your needs
L		The height from the top of the GRP tank neck to your desired surface level

Soil | Gravel 8/16 mm | Geotextile | Backfilling material (gravel 8/16 or suitable native soil) | Water

Top sections with standard covers

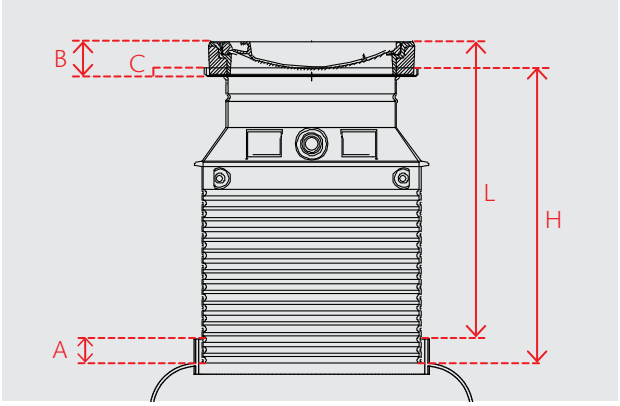
Top sections DN 600 mm

Load class A



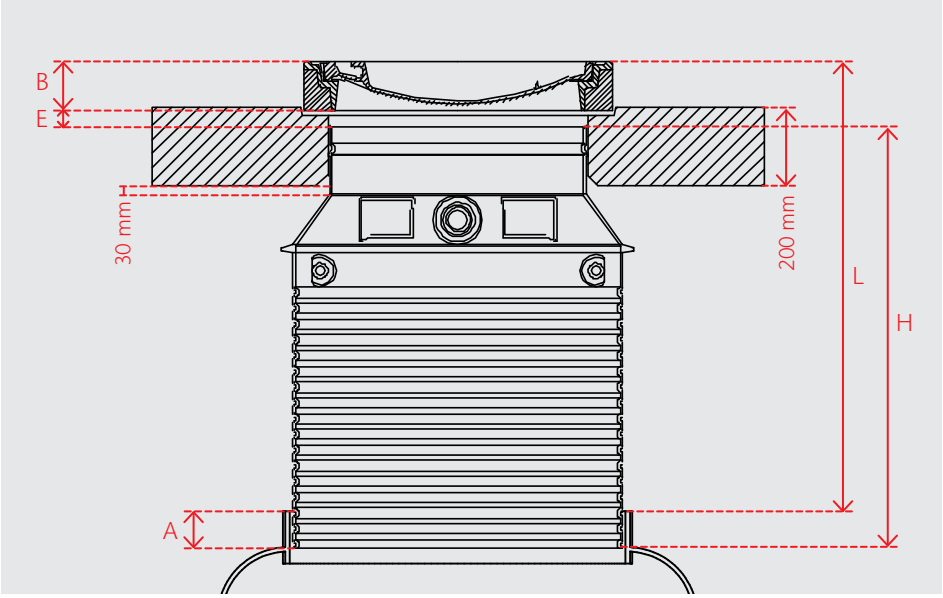
Dimensions		
A	B	C
115 mm	90 mm	22 mm
H = L + A + C – B	**H = L – B + 137 mm**	**H = L + 47 mm**

Load class B



Dimensions		
A	B	C
115 mm	125 mm	22 mm
H = L + A + C – B	**H = L –B + 137 mm**	**H = L + 12 mm**

Load class D



Prefabricated load distribution plate

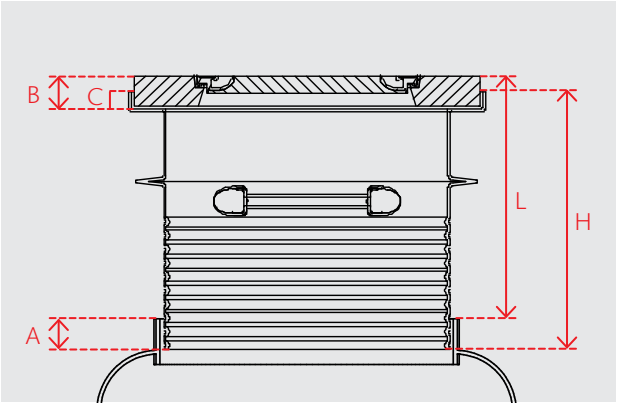
Dimensions		
A	B	E
115 mm	125 mm	50 mm
H = L + A – B – E	**H = L – B + 65 mm**	**H = L – 60 mm**

On-site production of load distribution plate

Dimensions		
A	B	E
115 mm	125 mm	70 mm
H = L + A – B – E	**H = L – B + 45 mm**	**H = L – 80 mm**

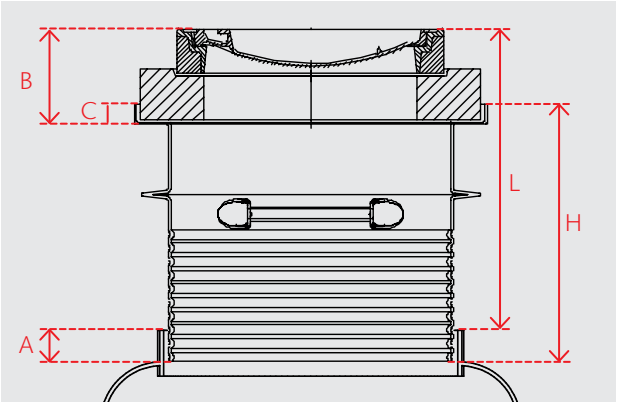
Top sections DN 800 mm

Load class A
Top section DN 800 with cover DN 600



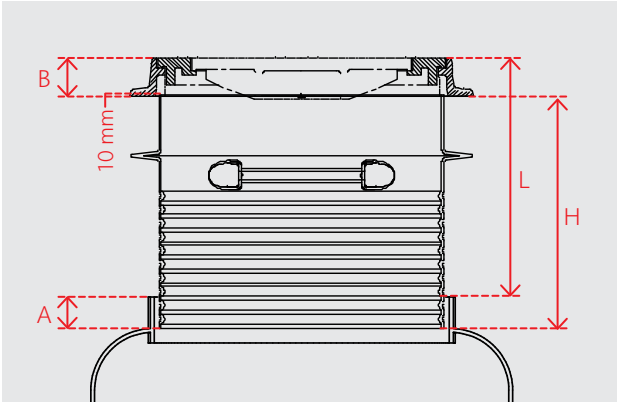
Dimensions		
A	B	C
115 mm	90 mm	45 mm
H = L + A + C – B	**H = L – B + 160 mm**	**H = L + 70 mm**

Load class B
Top section DN 800 with reduction ring and cover DN 600



Dimensions		
A	B*	C
115 mm	265 mm	45 mm
H = L + A + C – B	**H = L – B + 160 mm**	**H = L – 105 mm**

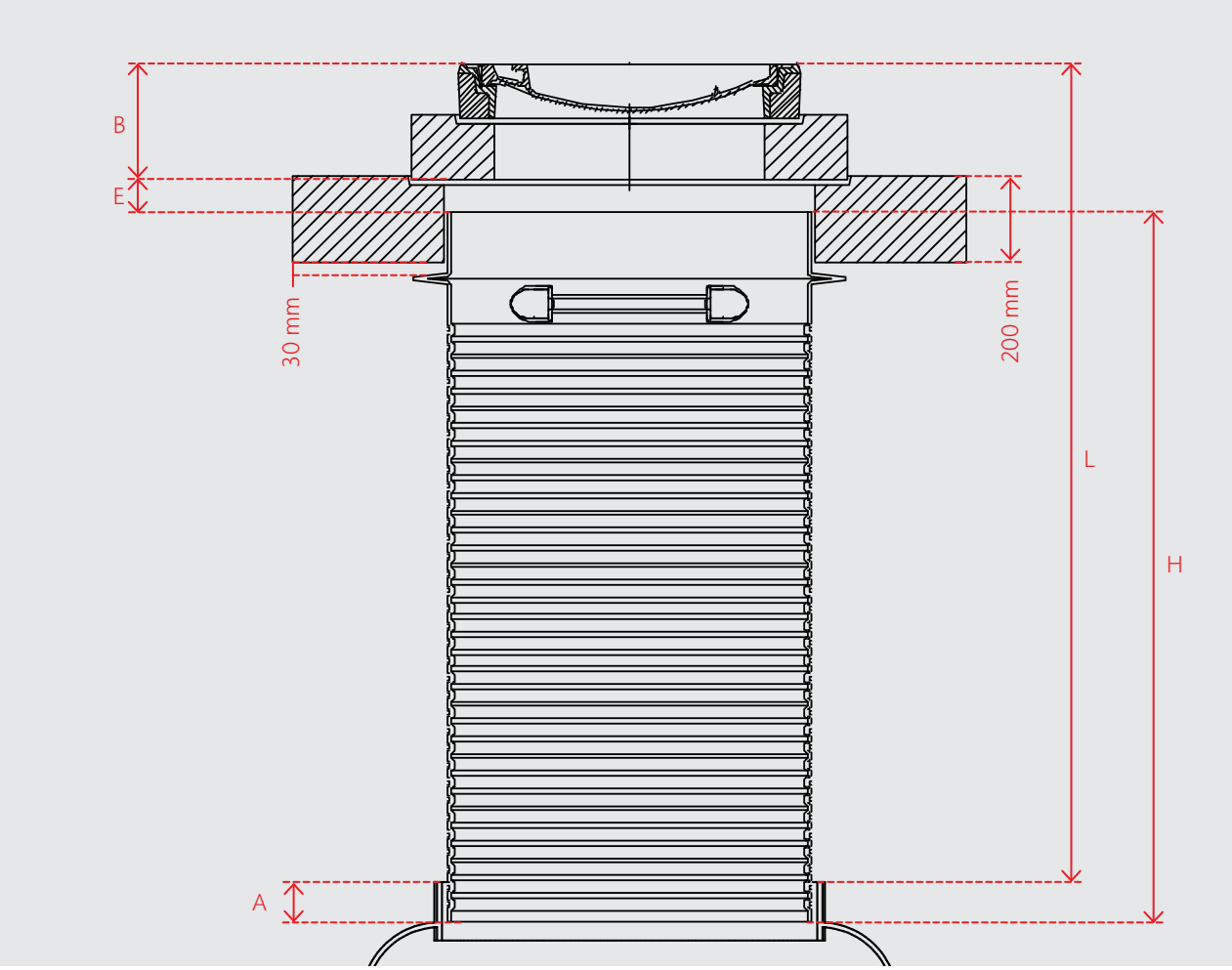
Load class B
Top section DN 800 with cover DN 800



Dimensions		
A	B	
115 mm	115 mm	
H = L + A – B +10 mm	**H = L – B + 125 mm**	**H = L + 10 mm**

* **Dimension B =** 150 mm reduction ring – 20 mm groove in reduction ring + 10 mm mortar bed + 125 mm top cover **B = 150 – 20 + 10 + 125 = 265 mm**

Load class D
Top section DN 800 with load distribution ring, reduction ring and cover DN 600



Prefabricated load distribution plate

Dimensions		
A	B*	E
115 mm	265 mm	85 mm
H = L + A – B – E	**H = L – B + 30 mm**	**H = L – 235 mm**

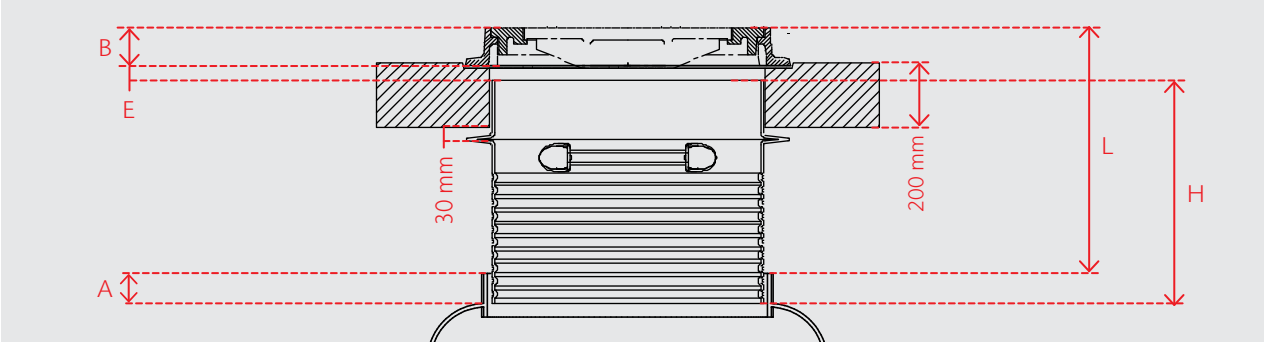
On-site production of load distribution plate

Dimensions		
A	B*	E
115 mm	265 mm	105 mm
H = L + A – B – E	**H = L – B + 10 mm**	**H = L – 255 mm**

* **Dimension B** = 150 mm reduction ring – 20 mm groove in reduction ring + 10 mm mortar bed + 125 mm top cover **B = 150 – 20 +10 +125 = 265 mm**

Load class D

Top section DN 800 with load distribution ring and cover DN 800



Prefabricated load distribution plate

Dimensions		
A	B	E
115 mm	115 mm	85 mm
H = L + A – B – E	**H = L – B + 30 mm**	**H = L – 85 mm**

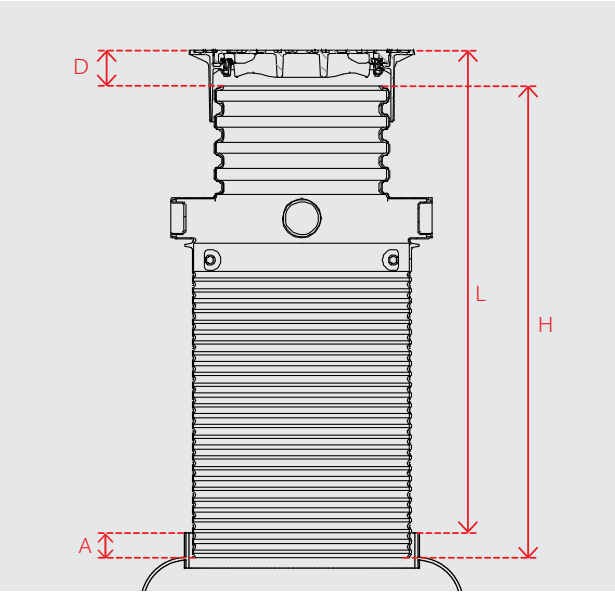
On-site production of load distribution plate

Dimensions		
A	B	E
115 mm	115 mm	105 mm
H = L + A – B – E	**H = L – B + 10 mm**	**H = L – 105 mm**

Top sections with floating covers

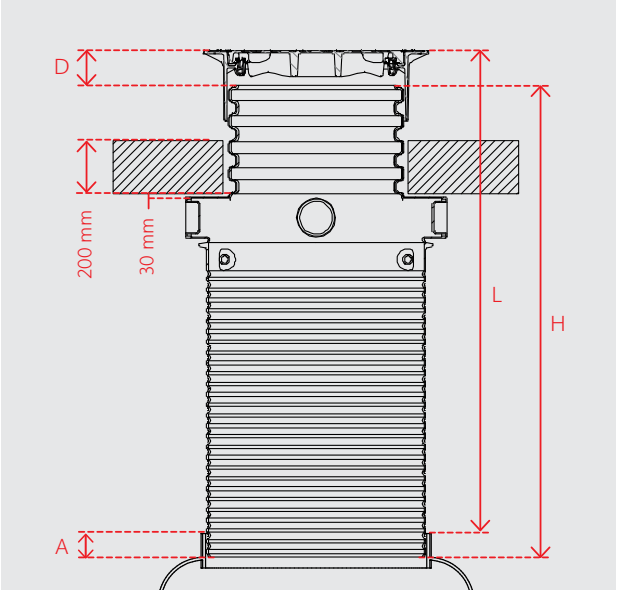
Top sections DN 600 mm

Load class B



Dimensions	
A	D
115 mm	135 mm
H = L + A – D	**H = L – 20 mm**

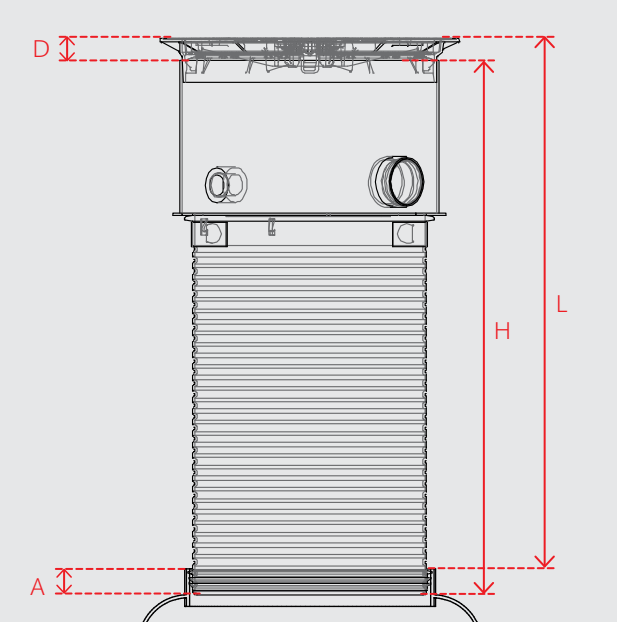
Load class D



Dimensions	
A	D
115 mm	135 mm
H = L + A – D	**H = L – 20 mm**

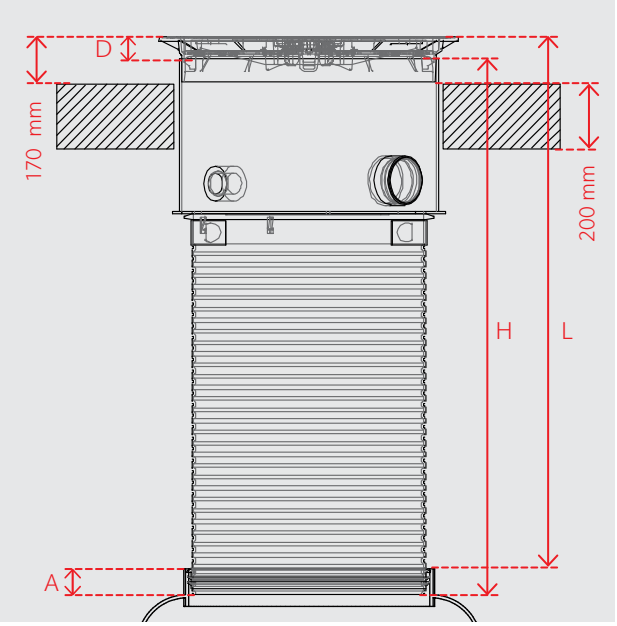
Top sections DN 800 mm

Load class B



Dimensions	
A	D
115 mm	80 mm
H = L + A – D	**H = L + 35 mm**

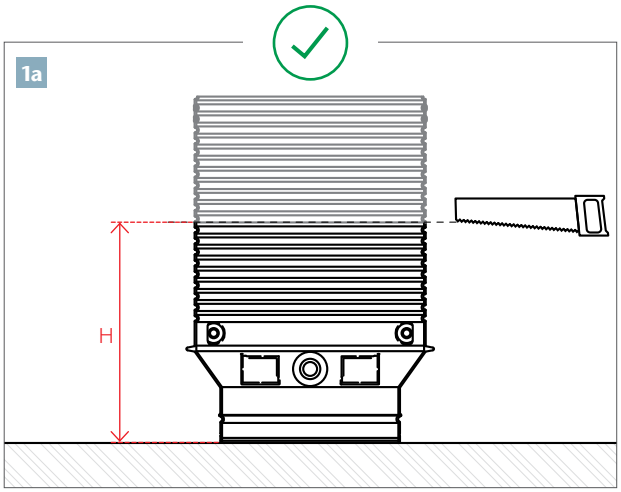
Load class D



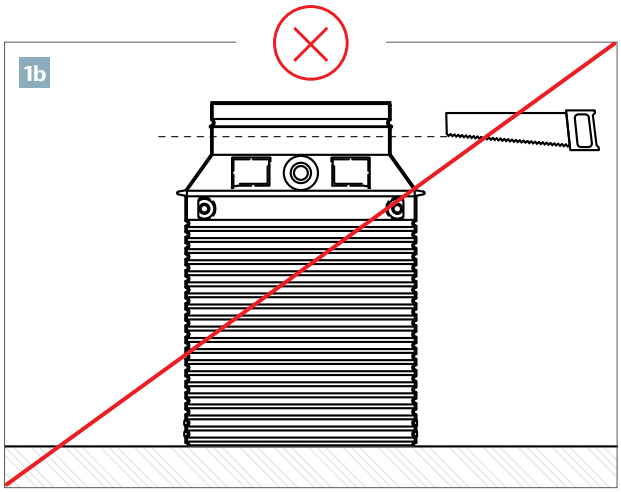
Dimensions	
A	D
115 mm	80 mm
H = L + A – D	**H = L + 35 mm**

- Properly cut the top section to the needed height as shown on fgure 10.1 (Cut off the excess from the bottom of the top section and not from the top).

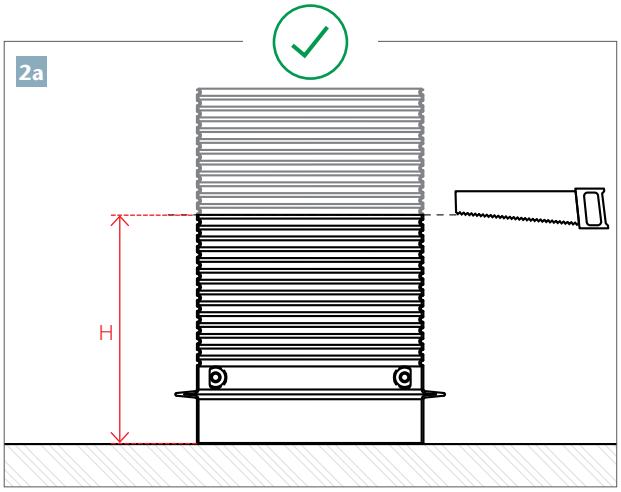
Figure 10.1 Cut the top section to the needed height



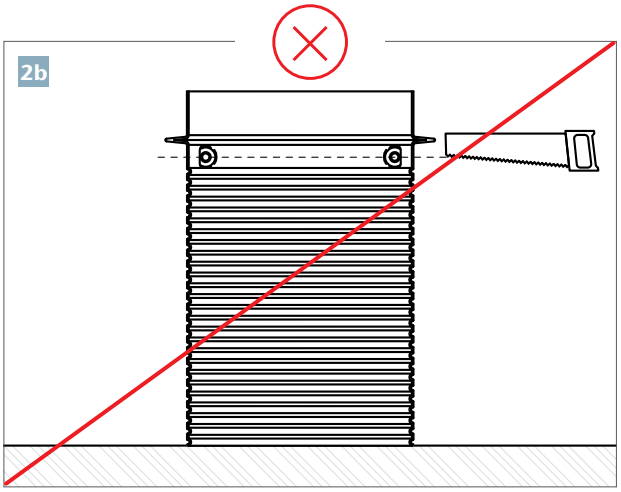
1a DN 600



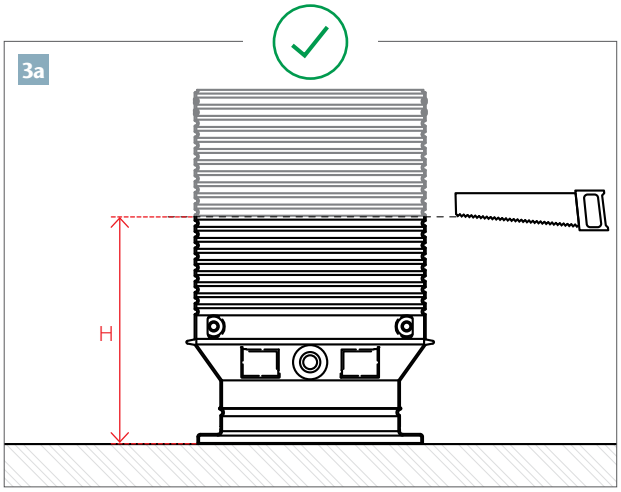
1b DN 600



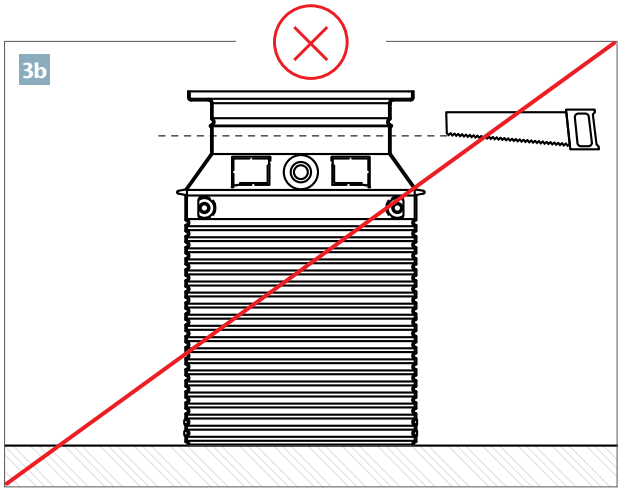
2a DN 800



2b DN 800



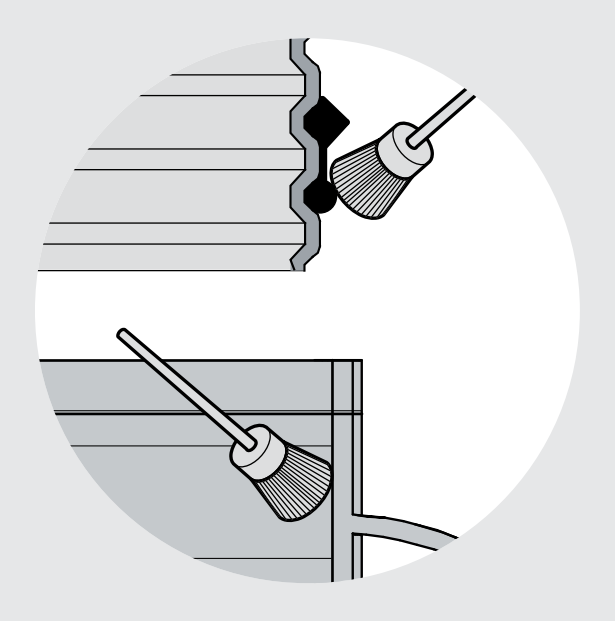
3a DN 600



3b DN 600

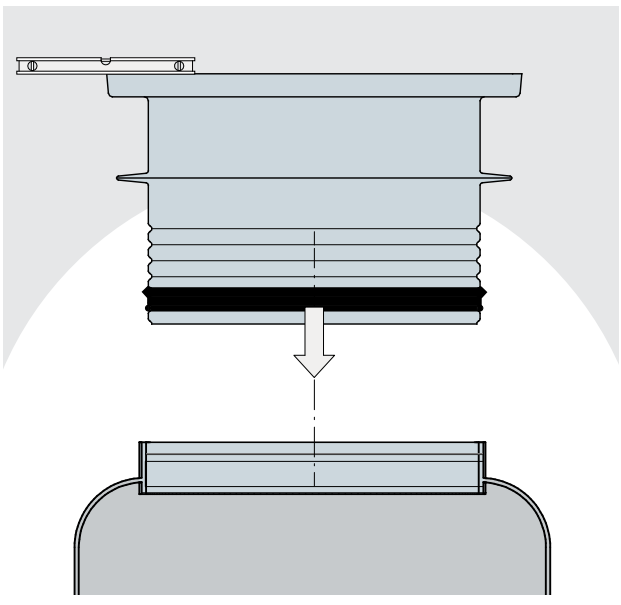
- Apply lubricant (suitable for use on rubber and GRP) on the rubber sealing and GRP part as well.

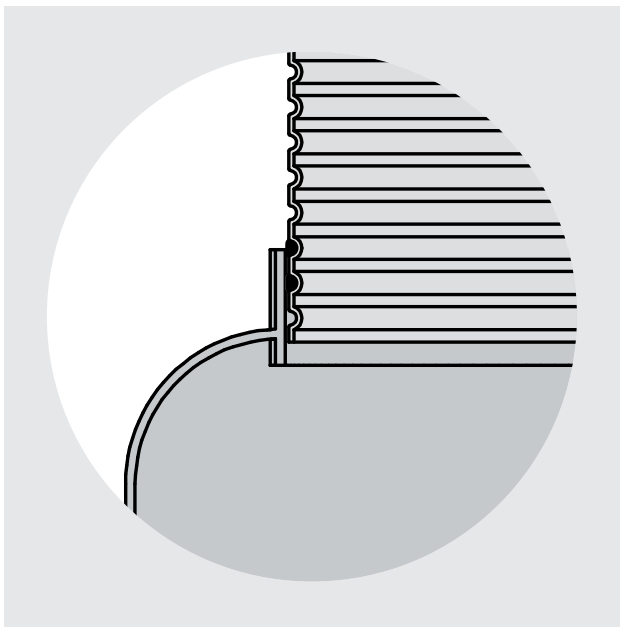
Figure 10.2 Lubricant application



- Place the rubber sealing into the grooves of the part of the top section which will be placed in the GRP part, and connect it to the GRP socket (collar) as shown on the figure 10.3, level it horizontally.
- Insert the top section into the GRP part, stop inserting when the top part of the rubber sealing sits on the GRP part.
- Note that the shape of the sealing may differ slightly from the drawings.

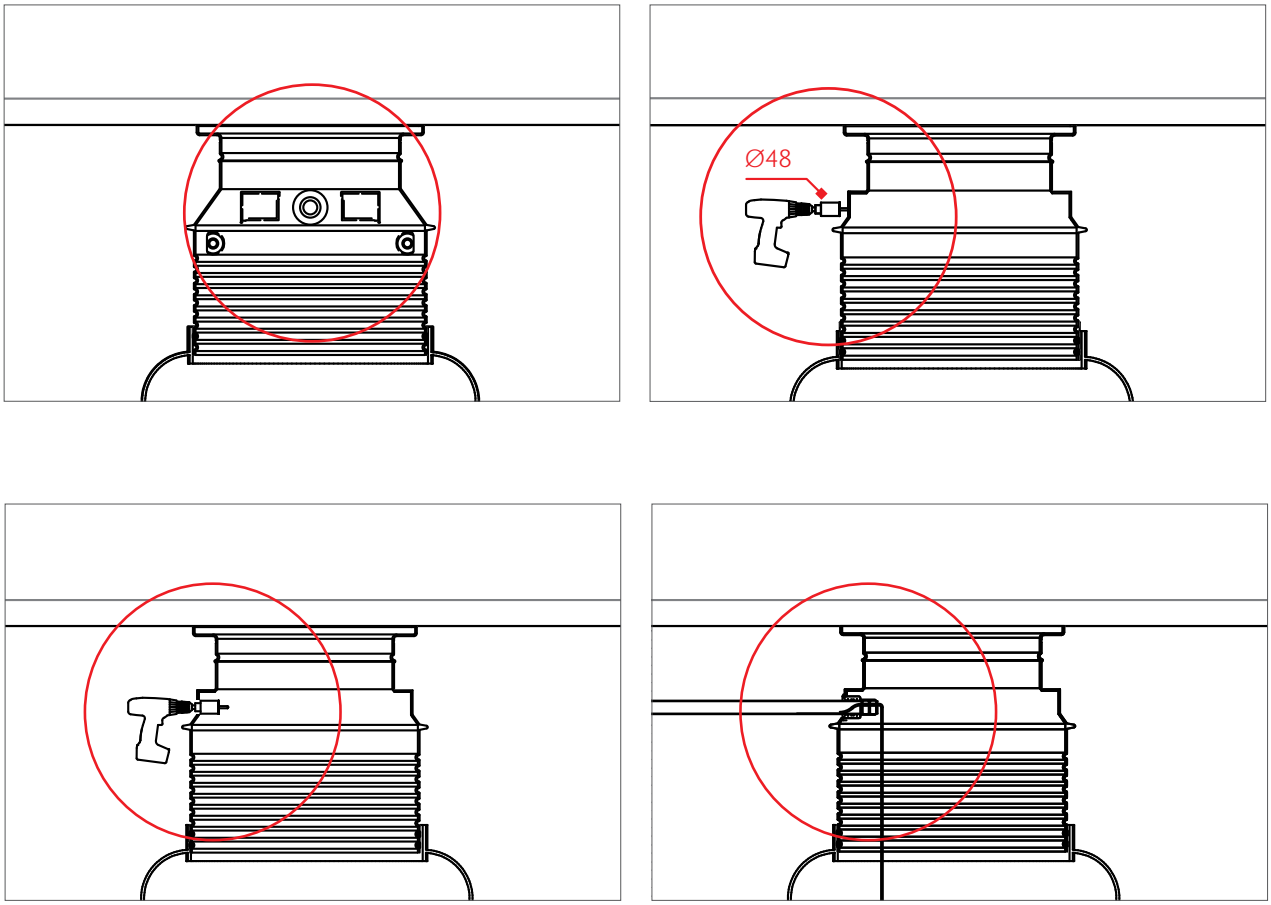
Figure 10.3 Inserting the top section into the GRP part





- In case of alarm equipped tank, prepare the openings for the cables in the top section as shown on the figure 10.4. Use proper cable protection and compact carefully around so the alarm cables will not get damaged.
- The exact heights of the alarm openings are listed in the product catalog.

Figure 10.4 Alarm connection



- Follow compaction specifications regarding compaction works around the top section – see section 6. Compaction specification.
- Compact the 500 mm layer immediately under the final surface to a soil elastic modulus appropriate to the final surface layer needs (note that you have to respect the compaction machinery specifications – see section 6. Compaction specification).

Figure 10.5 Compaction – soil elastic modulus specification (Young's modulus)

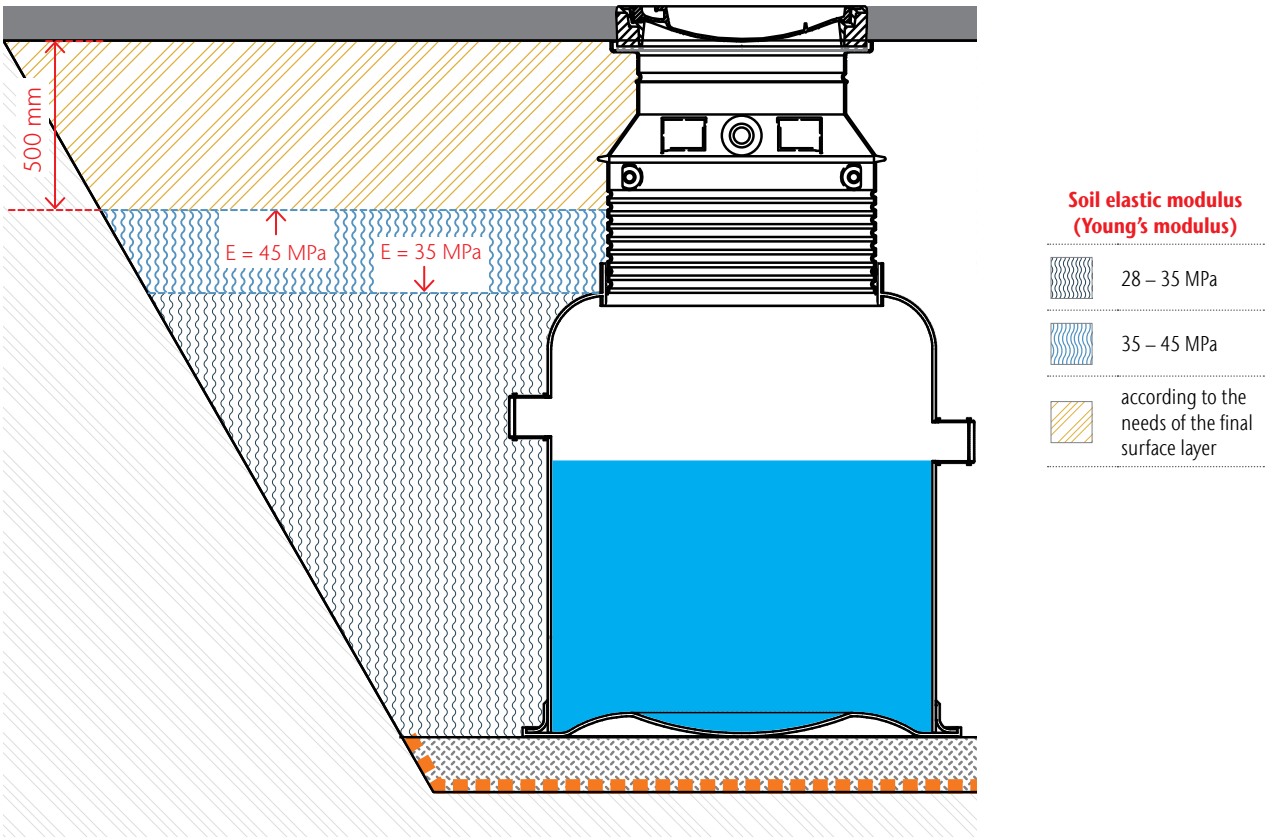
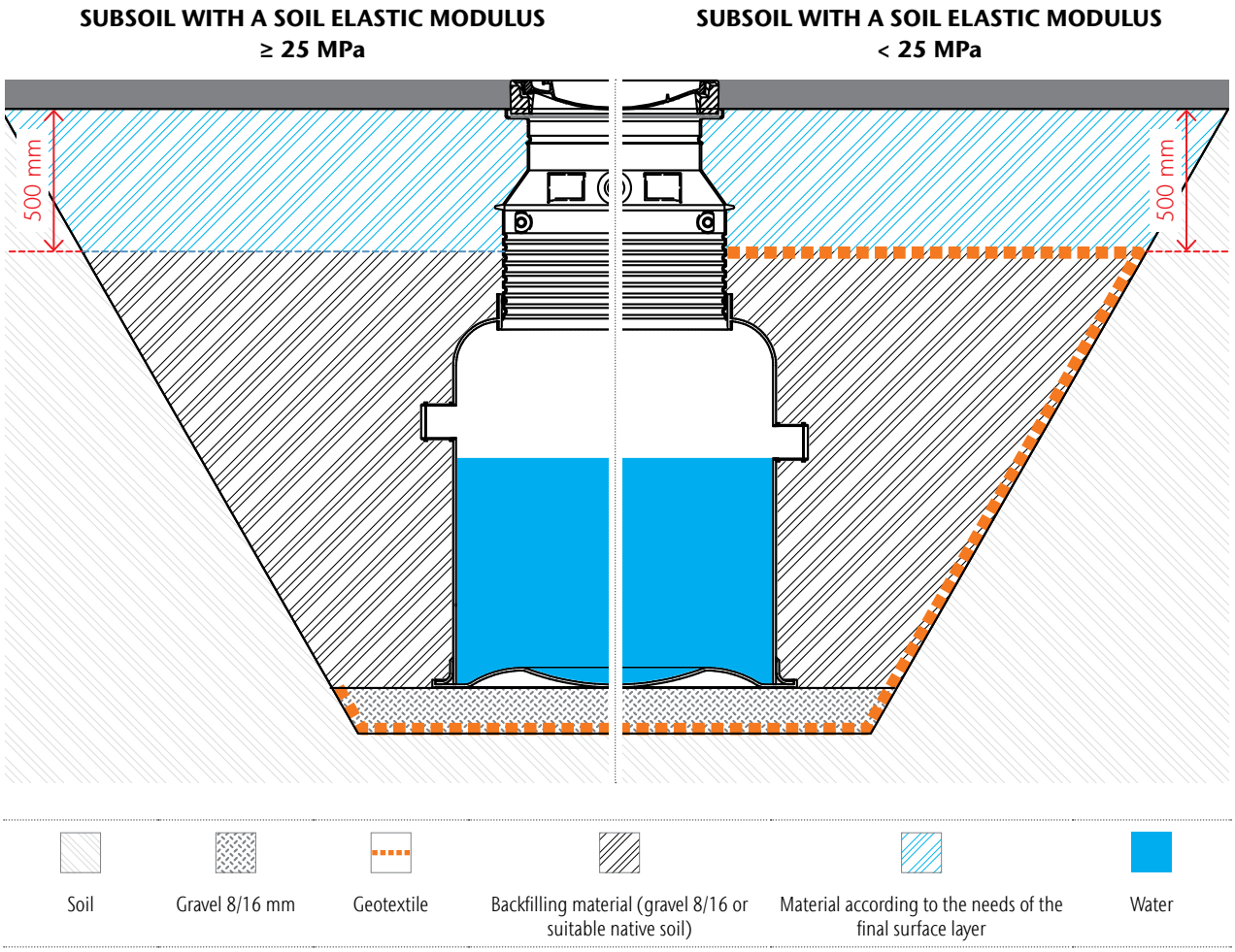


Figure 10.6 Backfilling and geotextile



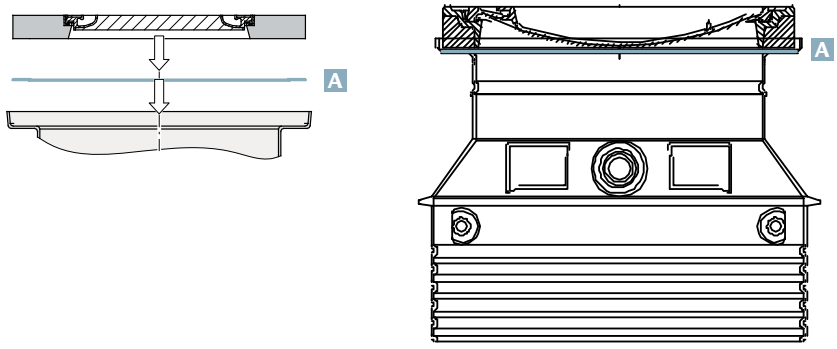
- If the subsoil properties necessitate the use of a geotextile lining in the excavation pit, fold the geotextile from the sides to the centre of the top section as indicated on the right side of the figure 10.6.
- Ensure materials appropriate for the surface layer are used in the 500 mm layer immediately under the surface layer. Note that the 300 mm immediately surrounding the tank must not contain gravel (or other objects) larger than 16mm, otherwise tank or top section damage is possible.

Top covers

Load class A15 and B125

- In the case of load class A15 or B125 install the prefabricated top parts suitable for the used top section.
- If no reduction ring is required and the top section has a plastic "collar", install the flat sealing into the plastic top section underneath the future prefabricated top cover as shown on figure 10.7.

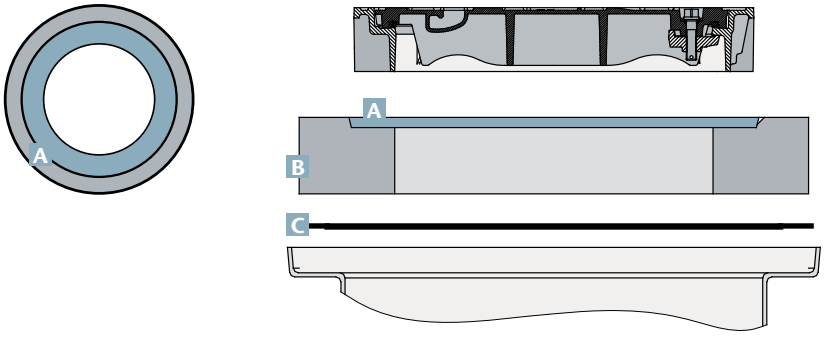
Figure 10.7 Installation of the top cover with flat sealing



A Flat sealing

- If using a reduction ring, install the flat sealing into the top section underneath the reduction ring. Apply a mortar bed 10 mm onto the reduction ring and then place the prefabricated top cover into the mortar bed as shown on the figure 10.8.

Figure 10.8 Installation of the top cover – case with reduction ring



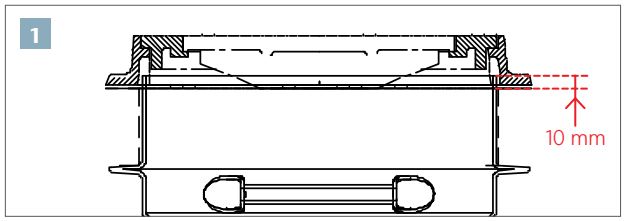
A Mortar bed

B Reduction ring

C Flat sealing

- In case of DN 800 top section with standard top cover DN 800 for load class B 125, there is no top section "collar" and therefore no flat sealing. The top cover goes over the top section as shown below. Place the top cover 10 mm under the top part of the top section as as indicated on the figure 10.9.

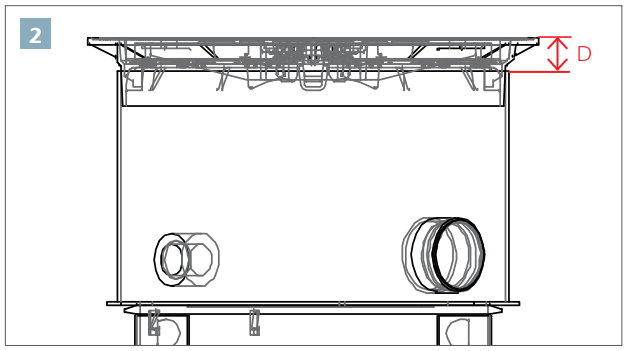
Figure 10.9 Standard top cover dimension



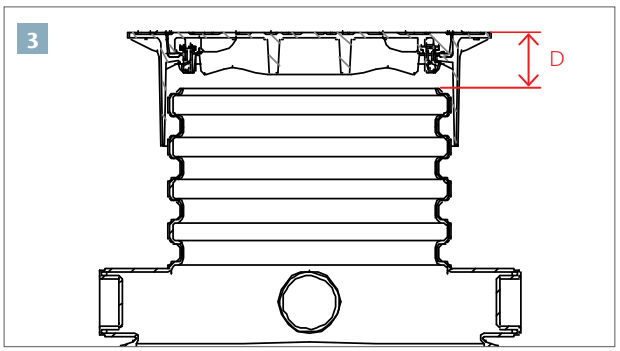
1 DN 800 top section with standard top cover DN 800 for load class B125

- In case of floating covers, install the top covers on the top section. Ensure the dimension D according to your top section and cover type as indicated in the figure below.

Figure 10.10 Floating top covers dimensions



2 Top section DN 800 with floating cover
Dimension D = 80 mm



3 Top section DN 600 with floating cover
Dimension D = 135 mm

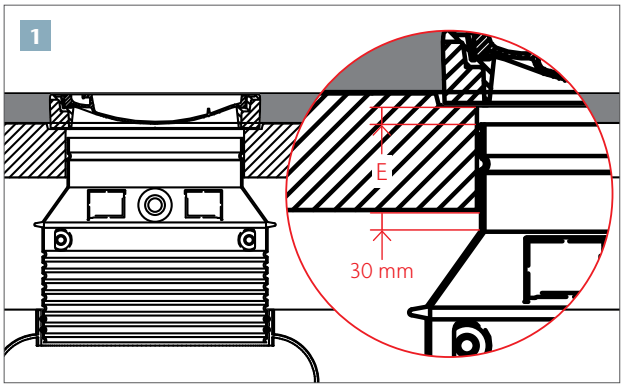
Load class D 400

- In case of load class D 400 it is necessary to install a reinforced concrete load distribution ring. Use an ACO prefabricated reinforced concrete load distribution ring or prepare one on site.

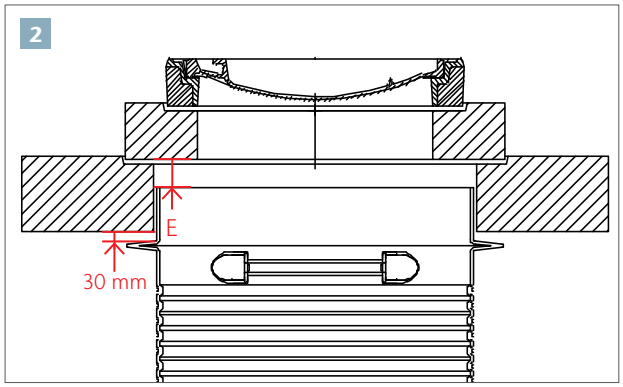
- When installing or preparing the reinforced concrete ring, ensure the space between the ring and the top section is as indicated on the figures below (ensure the 30 mm space and also the gaps indicated as E). The space E is according to your top section type – see figure 10.11.

- In case your top section does not have centered upper part (the upper DN600 part of the top section is not centred with the lower DN800 part) - center the load distribution ring with the lover DN 800 part. This is relevant for the DN600 top sections with floating covers. In order to center it with the lower DN800 part you need to use load distribution ring for DN 800.

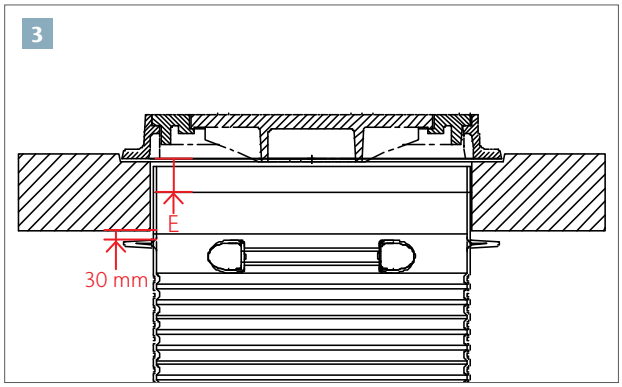
Figure 10.11 Concrete ring installation



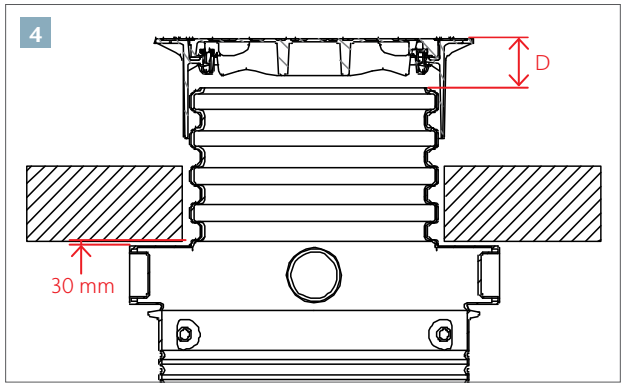
1 Top section DN 600.
Dimension E for prefabricated version E=50 mm,
for the case prepared on site E = 70 mm



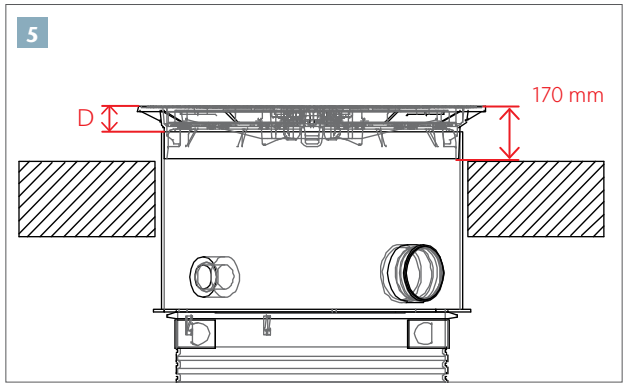
2 Top section DN 800 with reduction ring and top cover DN 600. Dimension E for prefabricated version E = 85 mm, for the case prepared on site E = 105 mm



3 Top section DN 800 with top cover DN 800.
Dimension E for prefabricated version E = 85 mm,
for the case prepared on site E = 105 mm



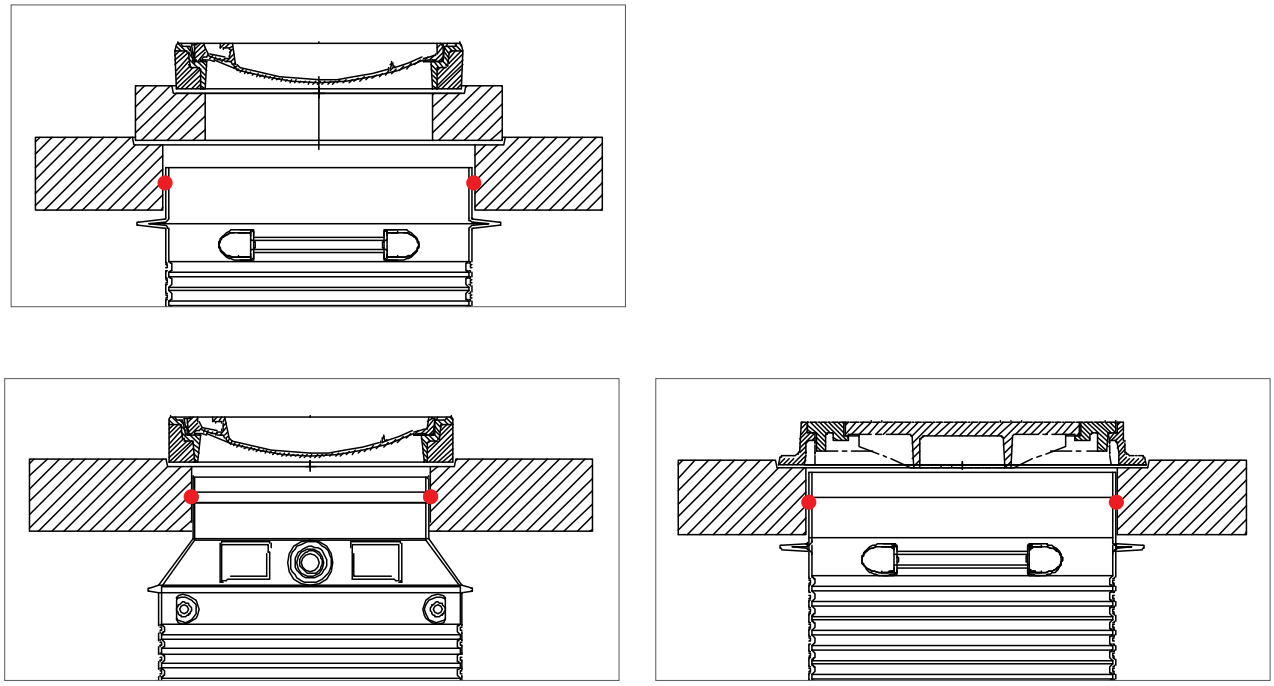
4 Top section DN 600 with floating cover. D = 135 mm



5 Top section DN 800 with floating cover. D = 80 mm

- When you use a prefabricated reinforced concrete ring, install the O-ring rubber sealing between the top section and the reinforced concrete ring as indicated in the figure 10.12.

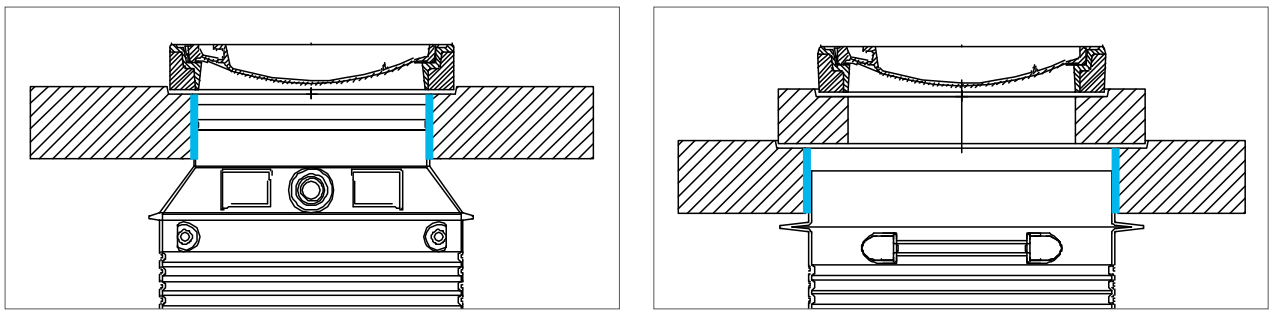
Figure 10.12 O-ring rubber installation

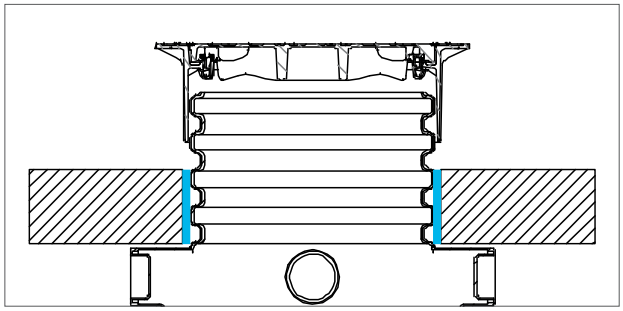


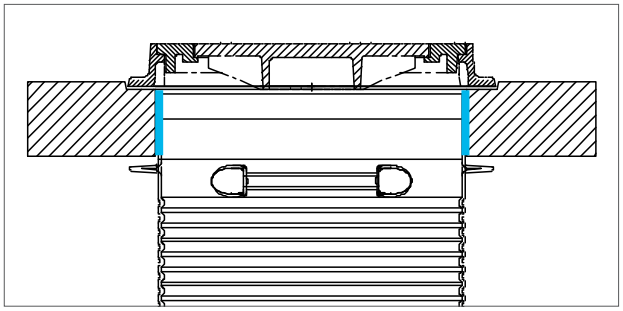
- If you prepare the reinforced concrete load distribution ring on site, follow the reinforcment plan.
  Note that the gap between the top of the top section and the top cover (or reduction ring underneath the top cover) must be ensured (see figure 10.11). Therefore the proper formwork on site must be prepared.

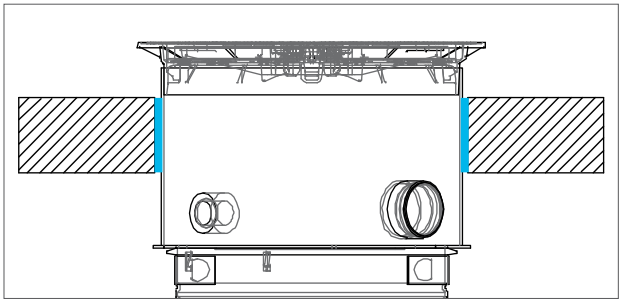
- If you prepare the reinforced concrete load distribution ring on site, place the expansion strip around the top section (between the top section and the future load distribution ring) as indicated on the figure 10.13.

Figure 10.13 Expansion strip placement



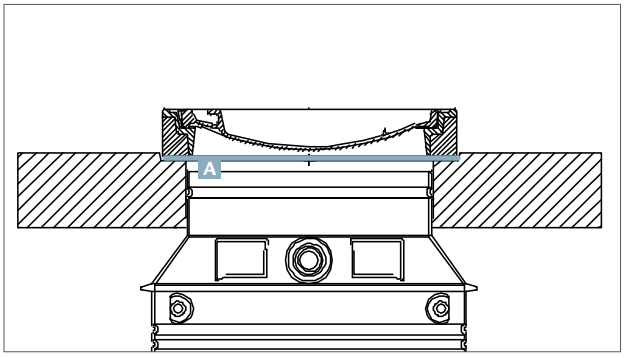




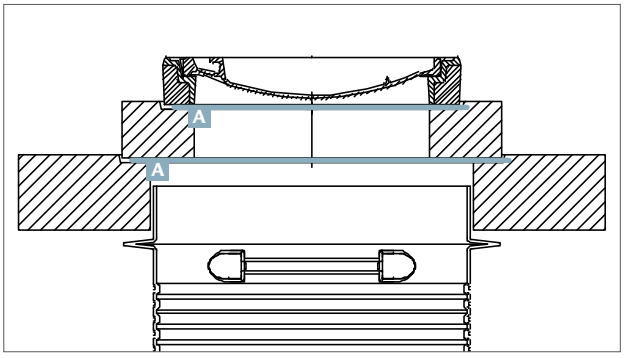


- Install a suitable top cover on the concrete load distribution ring in the 10 mm mortar bed. In case of top section with floating covers, install the floating cover on/in the top section.
- If you use a concrete reduction ring, apply mortar bed on the load distribution ring before installing the reduction ring, and apply a mortar bed also on the concrete reduction ring before installing the top cover as shown on figure 10.14.

Figure 10.14 Application of mortar bed



A Mortar bed



A Mortar bed

Reinforcement plan for the reinforced concrete load distribution plate

DN 600 top section with standard cover

- When preparing the concrete load distribution ring on site, see the reinforcement plan shown on the drawing and follow the instructions:

- Concrete C30/37
- Exposure classes XA2, XC2, XD2, XF2, XS1
- Load class SLW 60 (as per DIN 1072)
- Reinforcement steel: B500 (B)
- Reinforcement concrete cover: c = 40 mm
- Welded connection may only be carried out at upper reinforcement. For all welded connections DIN 1045 – 1 (para 9.2.2, table 12, lines 3 and 7) applies

Figure 10.15 Reinforcement plan for the load distribution reinforcement concrete ring DN 600

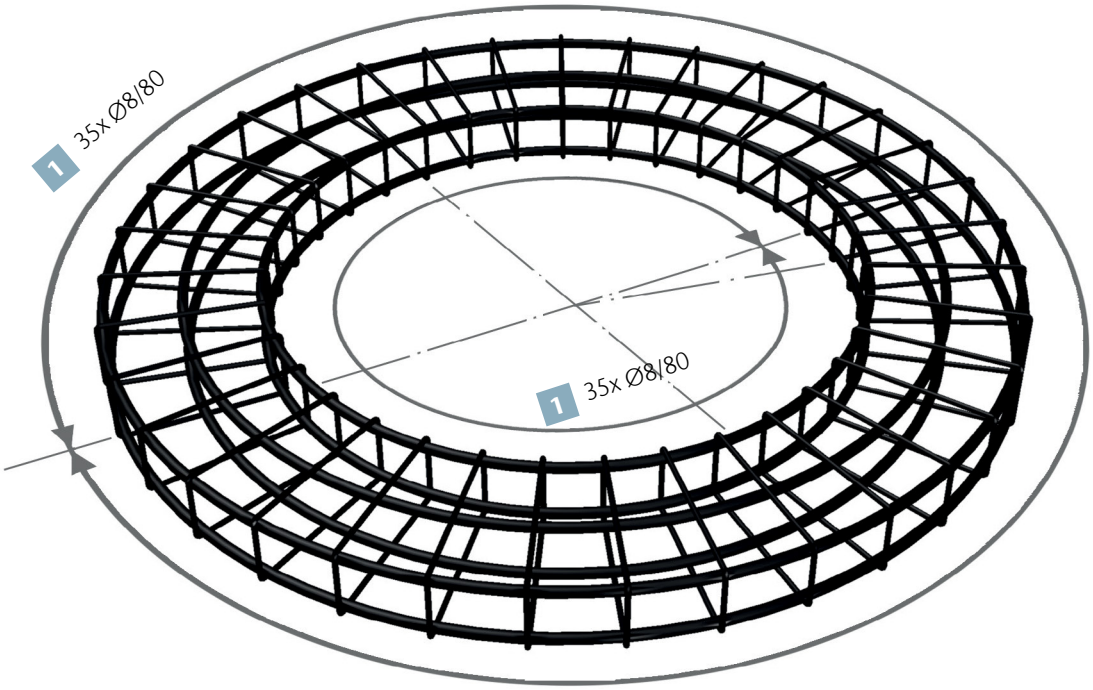


Figure 10.16 Cross section

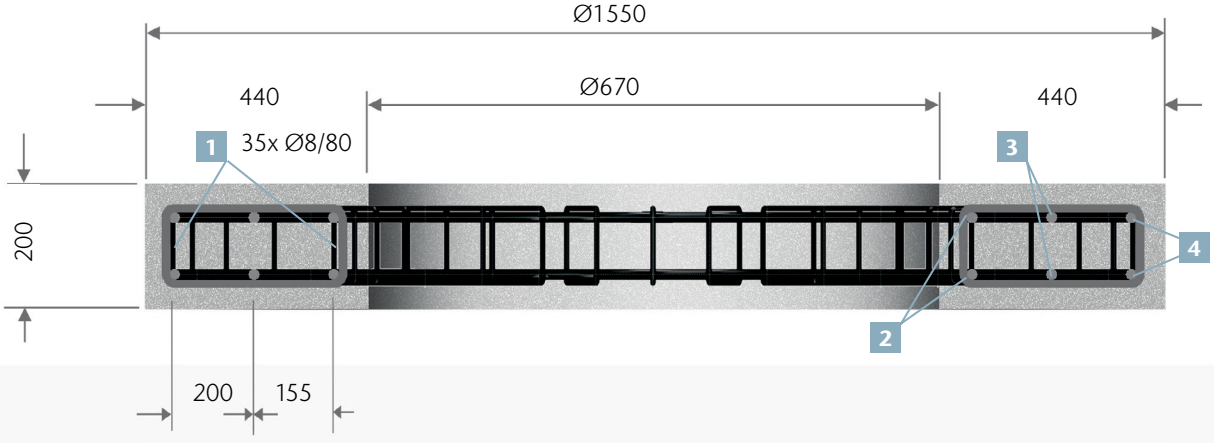
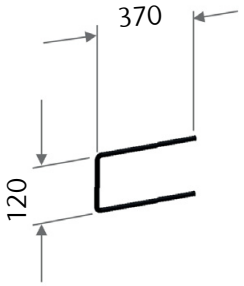
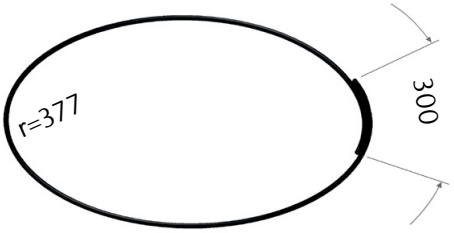
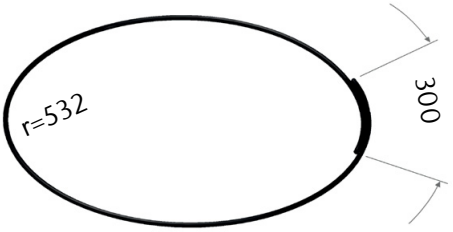
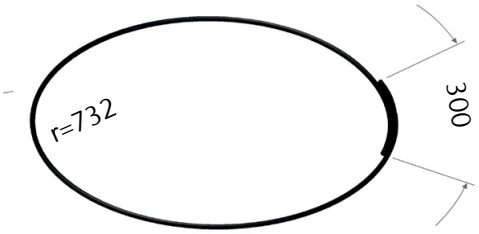


Table 10.1 Reinforced concrete ring DN 600 – reinforcement table

Item no.	Quantity	Ø	Length	Total length	d_{br}/d_s	External dimensions and inside radiuses deflection as per sia 162/din 1045
				[m]		[mm]
1	70	8	0,86	60,2	4	
2	2	8	2,67	5,34		
3	2	8	3,65	7,30		
4	2	8	4,90	9,80		

Total length: Σ Ø - 82,64 m; total weight: 32,64 kg

Reinforcement plan for the reinforced concrete load distribution plate

DN 800 top section with standard cover

■ When preparing the concrete load distribution ring on site, see the reinforcement plan shown on the drawing and follow the instructions:

- □ Concrete C30/37
- □ Exposure classes XA2, XC2, XD2, XF2, XS1
- □ Load class SLW 60 (as per DIN 1072)
- □ Reinforcement steel: B500 (B)
- □ Reinforcement concrete cover: c = 40 mm
- □ Welded connection may only be carried out at upper reinforcement. For all welded connections DIN 1045 – 1 (para 9.2.2, table 12, lines 3 and 7) applies

Figure 10.17 Reinforcement plan for the load distribution reinforcement concrete ring DN 800

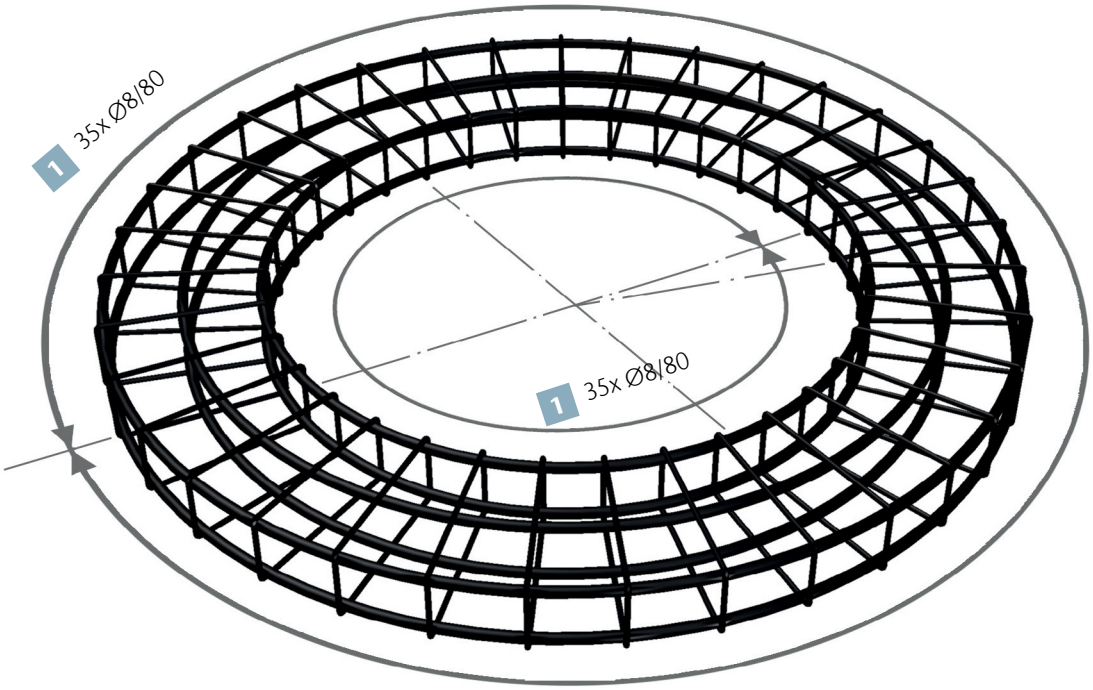


Figure 10.18 Cross section

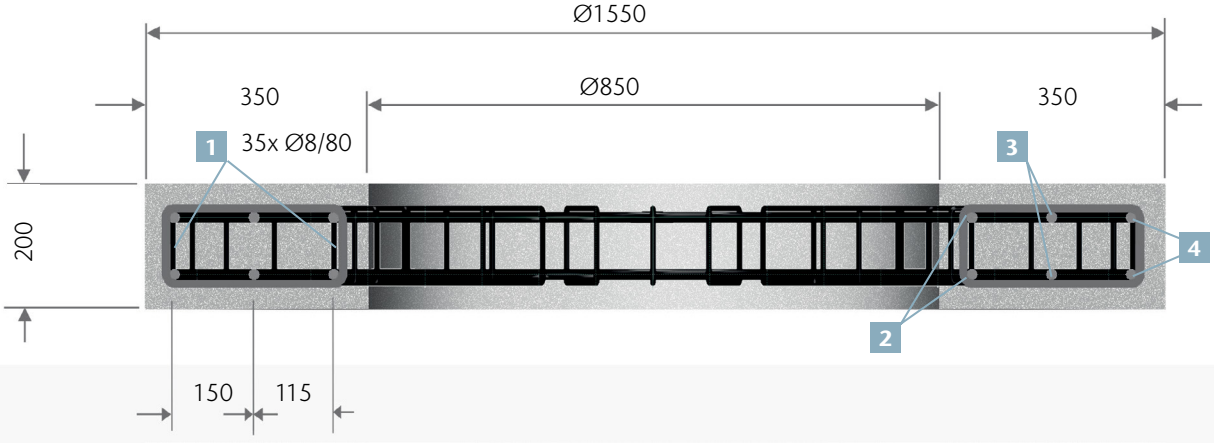
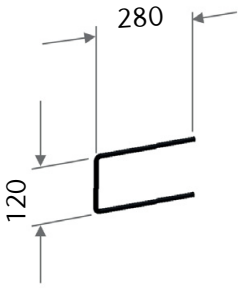
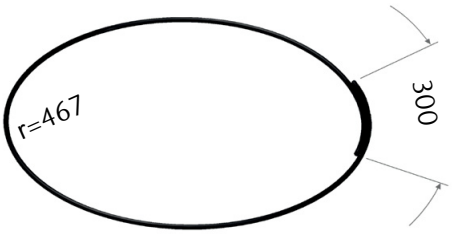
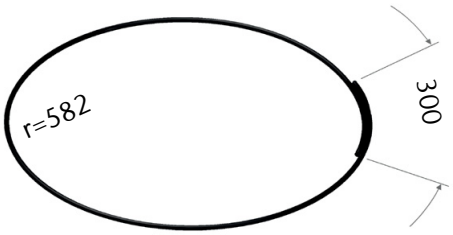
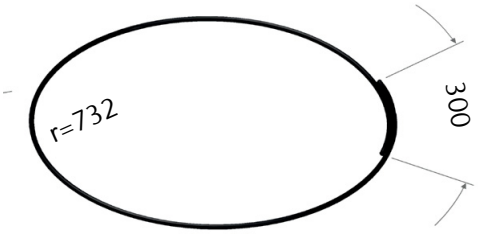


Table 10.2 Reinforced concrete ring DN 800 – reinforcement table

Item no.	Quantity	Ø	Length	Total length	d_{br}/d_s	External dimensions and inside radiuses deflection as per sia 162/din 1045
				[m]		[mm]
1	70	8	0,68	47,6	4	
2	2	8	3,23	6,46		
3	2	8	3,95	7,90		
4	2	8	4,90	9,80		

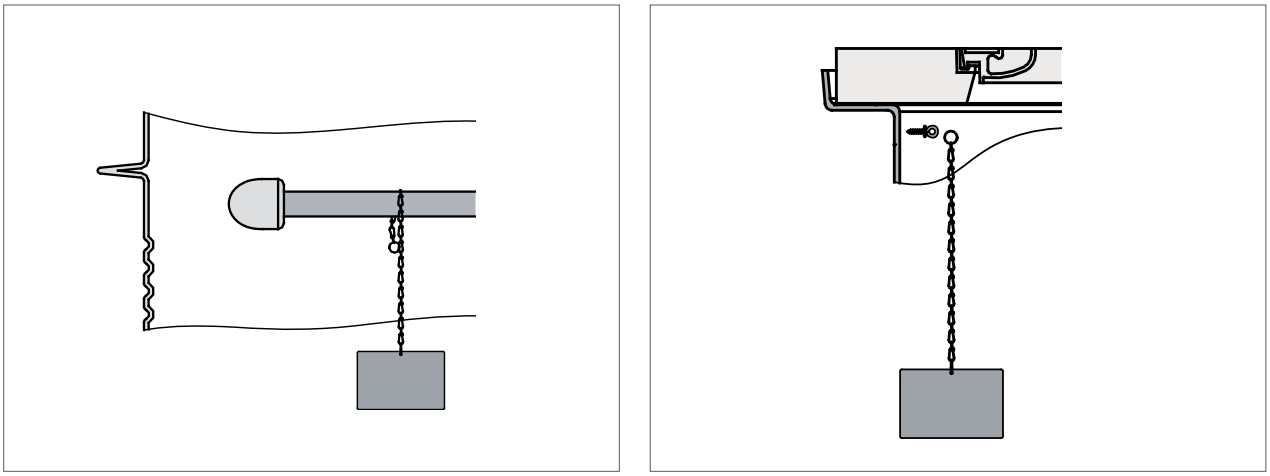
Total length: Σ Ø - 71,76 m; total weight: 28,35 kg

Designation label

- In case of Oleopator G, Oleopator Bypass G, Oleosmart G and Lipumax G the designation label must be placed inside of the top section. Attach the enclosed designation label (which is supplied with the product) onto the bar inside of the top section, as indicated in the drawing.

- If the top section has no bar inside to attach the designation label, use a self-tapping eye screw (stainless steel) with rubber sealing ring and screw it into the top section. Afterwards attach the supplied designation label to the eye of the screw.

Figure 10.19 Designation label



11 List of figures

12 List of tables

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Edition 04/2023 – Subject to alterations