

Installation, assembly and maintenance instructions for Superstrong 600/ 900/ 1200/ 1500 L

12.4201	600L Basic
12.4202	900L Basic
12.4203	1200L Basic
12.4204	1500L Basic



The points described in these instructions must be observed under all circumstances. All warranty rights are invalidated in the event of non-observance. Separate installation instructions are enclosed in the transportation packaging for all additional articles purchased from GARANTIA Australia.

The tank must be checked for any damage prior to insertion into the trench under all circumstances.

Information & support are available
info@grafaustalia.com.au

1300 131 971

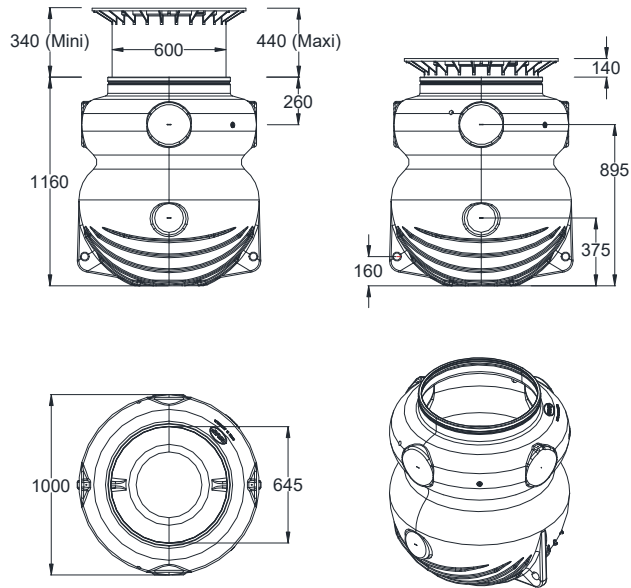
Table of contents

1. TECHNICAL DATA	2
2. TANK STRUCTURE	5
2.1 Superstrong 600 L, 900 L and 1200 L	5
2.2 Superstrong 1500 L	5
3. TRANSPORT AND STORAGE	6
4. INSTALLATION AND ASSEMBLY	7
4.1 Overview	7
4.2 Installation specifications	7
4.3 Inserting and backfilling	14
4.4 Fitting the intermediate piece	16
5. INSPECTION AND MAINTENANCE	17

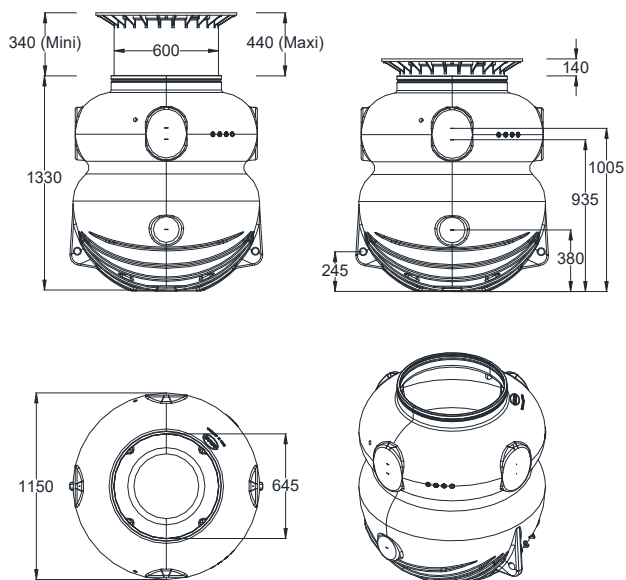
1. Technical data

1.1 Technical data Superstrong 600 L, 900 L, 1200 L

600 L:

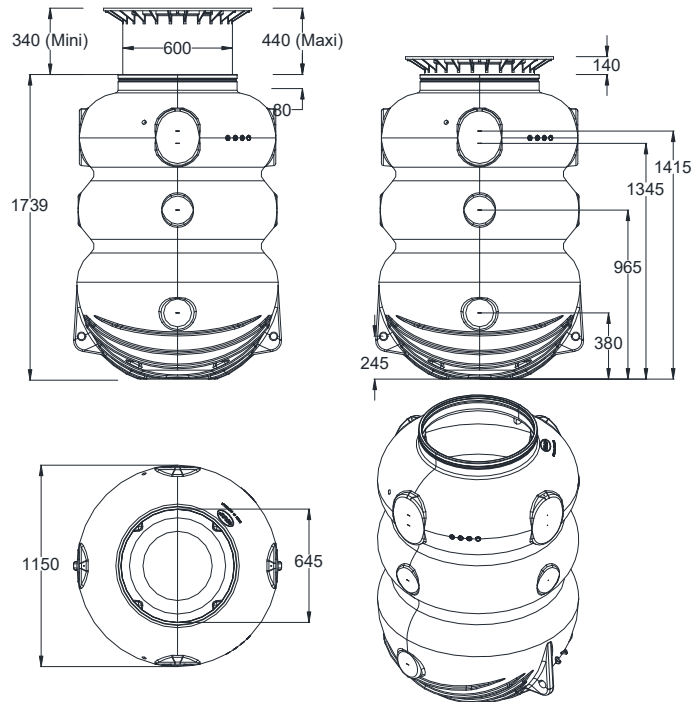


900 L:

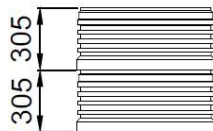


1. Technical data

1200 L:

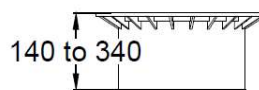
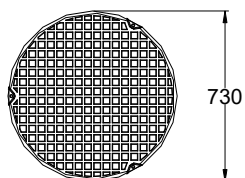


GRAF extension riser



stackable riser (available for deeper installation)
code 371003

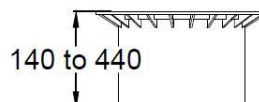
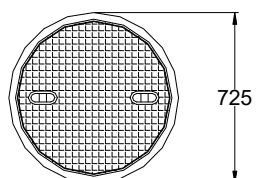
Pedestrian cover



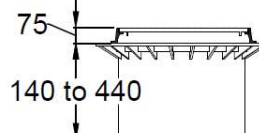
pedestrian loads

440mm pedestrian option available upon request

Trafficable cover



car loads

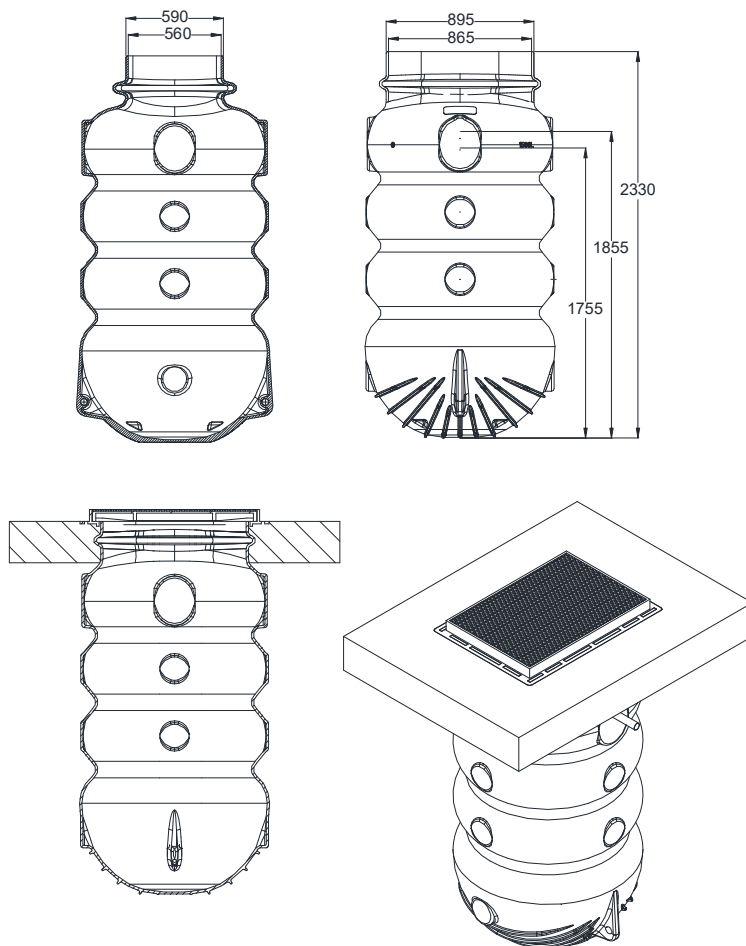


truck loads (special installation required)

1. Technical data

1.2 Technical data Superstrong 1500 L

1500 L:



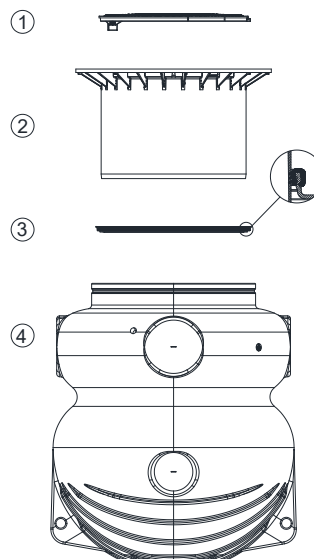
Overview of technical data

Shaft	600 L	900 L	1200 L	1500 L
Shaft weight [kg]	33	54	81	123
L [mm]	Ø 1000	Ø 1150	Ø 1150	866
B [mm]	Ø 1000	Ø 1150	Ø 1150	562
H [mm]	1160	1330	1740	2330
Top connection	max. DN160	max. DN160	max. DN160	max. DN160
Bottom connections	max. DN110	max. DN110	max. DN110	max. DN110

2. Tank structure

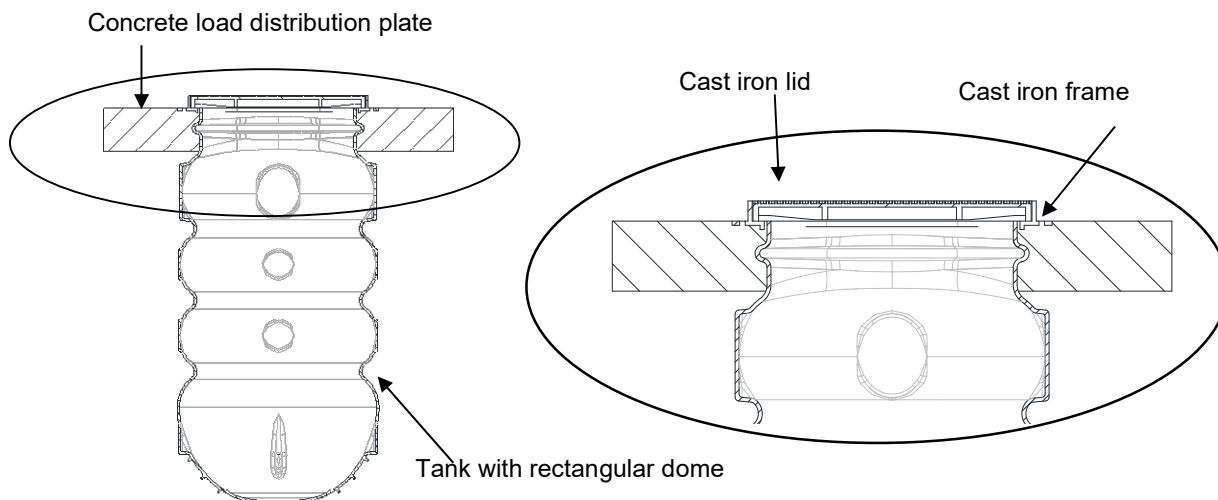
2.1 Superstrong 600 L, 900 L and 1200 L

- 1) Cover
- 2) Telescopic dome shaft (can be tilted by 5°)
- 3) Seal
- 4) Superstrong tank



2.2 Superstrong 1500 L

The tank is installed exclusively with a 20 cm load distribution plate without additional earth cover. The load distribution plate is made of reinforced concrete. The plate extends beyond the tank dimensions by at least 1 m. The load distribution plate must be statically calculated for each construction project.



3. Transport and storage

Unloading and transport must be carried out by qualified persons. Take the dimensions and weight of the tank into account.

Familiarise yourself with the safety instructions before unloading and transporting.

- Read and follow the instructions described in this manual.
- When lifting and transporting the system, follow the health and safety regulations and best practices.
- The tank transport and installation must be shock-proof.

Transport instructions

During transport, the tank must be secured to prevent slipping and falling. If the components are secured with straps during transport, it must be ensured that they remain undamaged.

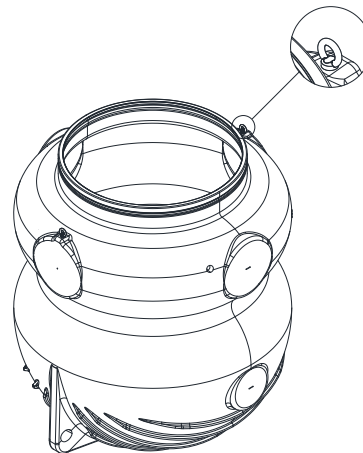
Impact stresses must be avoided. Under no circumstances should the tanks be rolled or pulled across the floor.

Unloading

Unloading can be carried out using the two factory-fitted lifting eyes (eyebolts M8), which are located on the top of the tank (see illustration).

Attention: Please note that unloading may only take place when the tank is empty and should be carried out quickly to avoid putting too much strain on the lifting eyes.

Under no circumstances may persons stand under the lifted load.



Storage

Observe the following instructions when storing the shaft:

- Only store the tank on flat, level surfaces, to prevent it to be damaged by point loads.
- Only place the tank on a base that would bear its load.
- Only store the tank with the covers and connections closed.
- Do not place any loads on the tank.
- Secure the tank against strong wind loads.
- Protect the tank from sunlight during longer storage periods.

4. Installation and assembly

4.1 Overview

The system is placed in an excavation pit on a compacted foundation substructure. The excavation pit is backfilled with suitable backfill material and the top layer is constructed. For installation in damp subsoil (groundwater/clay soils), please observe the permissible earth covers, surface load and groundwater levels (see chapter 4.2.5.).

Installation and assembly must be planned and carried out by qualified persons.

- Familiarise yourself with the safety instructions before installation and assembly.
- Read and follow the installation specifications and instructions described below.
- Failure to observe these instructions may result in waiver of warranty.

4.2 Installation specifications

4.2.1 Conditions at the installation site

In addition to the general specifications for executing and backfilling the excavation, the installation position and installation depth depend on the following:

- the soil and water conditions at the installation site
- the intended surface utilisation
- different conditions at the installation site

Under certain circumstances, structural measures may also be necessary to create suitable installation conditions.

Important to clarify before installation:

- Structural suitability of the subsoil
 - Soil mechanical properties
 - Maximum groundwater levels or seepage capacity of the subsoil
 - frost-free soil depth
 - Load types occurring (e.g. traffic loads)
 - Nature of the terrain and surroundings
 - Surrounding buildings and traffic areas
-

A soil survey should be commissioned by a qualified person to determine the specific site conditions.

4 Installation and assembly

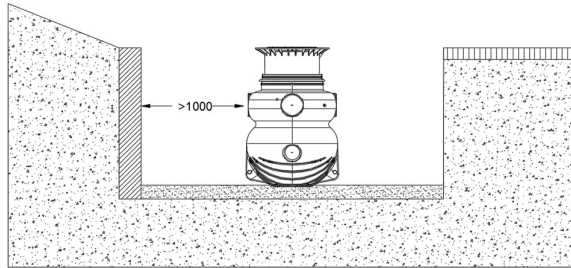
4.2.2 Installation location: Distances

Special requirements apply for the installation of the tank in the vicinity of buildings and traffic areas as well as for installation on slopes. The distance to fixed structures must be at least 1000 mm.

Note: Ensure no load is passed to the tank.

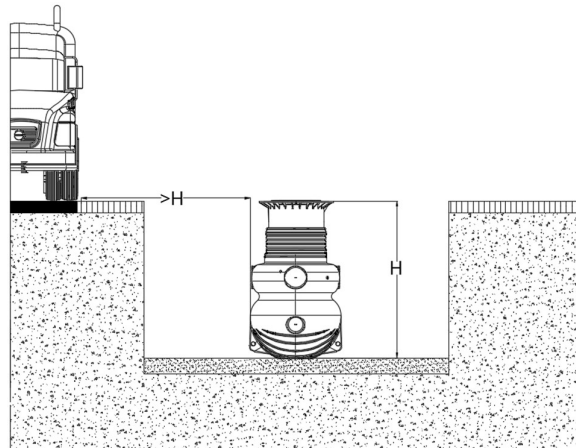
Distance to ground elevations (slopes, hills, embankments, ...)

When installing the shaft in the immediate vicinity (< 5 m) of a slope, mound or embankment, a statically calculated retaining wall must be erected to absorb the loads. The wall must project beyond the tank dimensions by at least 500 mm in all directions and have a minimum distance of 1000 mm to the tank.



Distance to neighboring traffic areas and buildings

If the manholes are installed next to traffic areas that are used by heavy vehicles over 3.5 tonnes, the minimum distance to these areas must be at least the depth of the pit.



4 Installation and assembly

4.2.3 Requirements for the excavation pit

Stability and load-bearing capacity

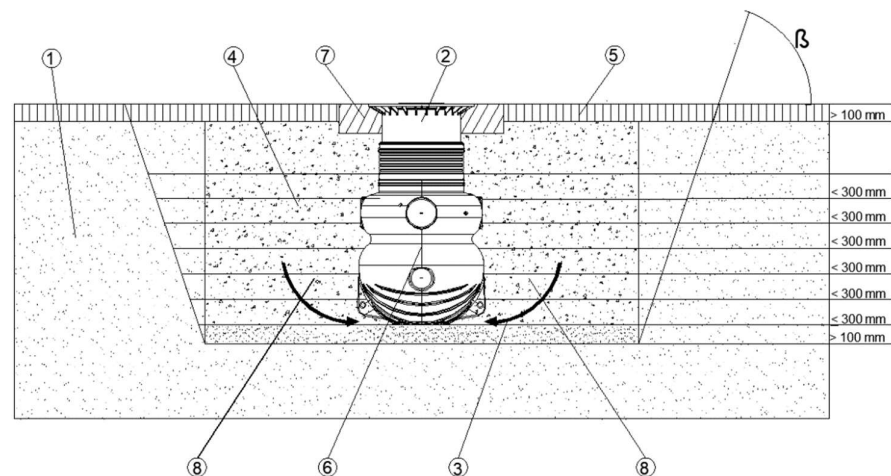
The walls of the excavation pit must be embanked, shored or otherwise secured in such a way that they are stable during the entire construction period for safe work conditions. The excavation pit must be kept free of water during the entire installation period.

The subsoil must have sufficient load-bearing capacity to permanently prevent subsequent settlement of the system. If necessary, the load-bearing capacity must be established by compaction or a suitable substructure.

Area requirement and excavation depth

To ensure that there is sufficient working space, the base area of the excavation pit must exceed the tank dimensions by > 300 mm on each side and the distance to fixed structures must be at least 1000 mm. Refer to 4.2.2.

The depth of the pit must be dimensioned so that the maximum earth cover (see chapter 4.2.4.) above the tank is not exceeded. For year-round utilisation of the system, the tank and its components must be installed in a frost-free area. As a rule, the frost-free depth is approx. 600-800 mm, exact details can be obtained from the authority responsible. A layer of compacted round grain gravel (grain size 8-16mm, thickness approx. 100-150 mm) is applied as a substructure.



- | | |
|--|--|
| 1) Soil | 5) Top layer |
| 2) Tank opening | 6) Superstrong tank |
| 3) Compacted foundation substructure | 7) Concrete collar, for trafficked areas |
| 4) Backfilling (round grain gravel max. grain size 8/16) | 8) Ensure tight backfilling in the tank surroundings, especially in the base indicated by the arrows |

Attention: The subsoil must be horizontal and level and ensure sufficient load-bearing capacity.

From a pit depth greater than 1250 mm, a slope with the angle β according to the following table must be created:

Soil type	Slope angle β in °
Non-cohesive soil, soft cohesive soil	$\leq 45^\circ$
Stiff or semi-solid cohesive soil	$\leq 60^\circ$
Rock	$\leq 80^\circ$

4 Installation and assembly

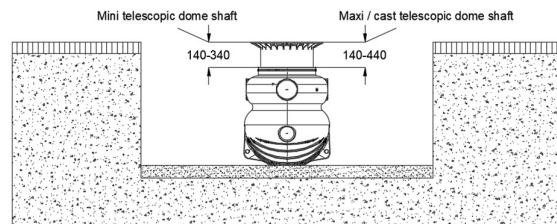
4.2.4 Installation conditions Superstrong

The Superstrong 1500 L tank is installed exclusively with a 20 cm load distribution plate without additional earth cover and without extension (see chapter 2.2.). The other installation conditions for this tank can be found in chapter 4.2.5 and chapter 4.2.6.

The earth cover requirements for different installation conditions of the Superstrong 600L, 900L and 1200L are shown below:

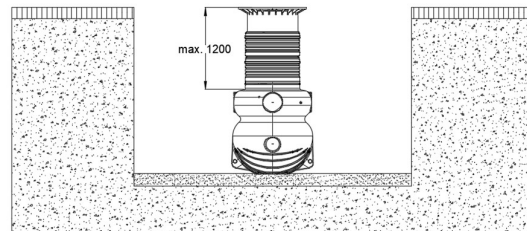
The minimum earth cover in green landscape areas without traffic is 300mm.

(without groundwater and stratum water)



The maximum earth cover in green landscape areas without traffic is 1200mm, see also 4.3.1.

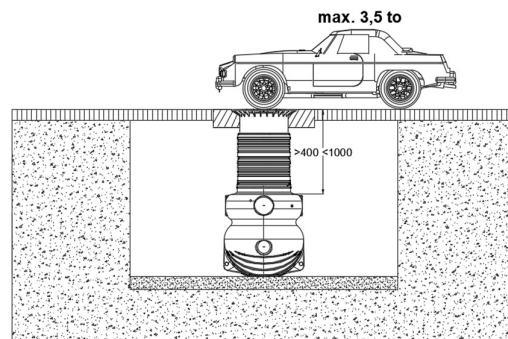
(without groundwater and stratum water)



Permissible earth cover in areas with car traffic (max. total load 3.5 tonnes) is 1000mm, see also 4.3.2.

(without groundwater and stratum water)

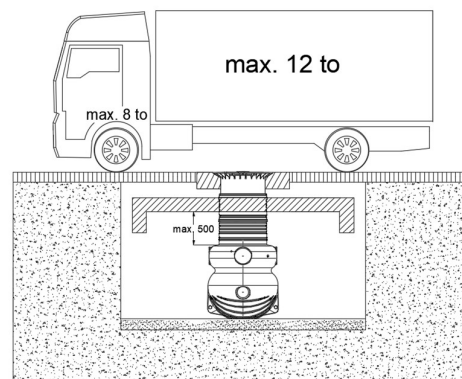
Cast iron cover (class B) required.



In areas with truck traffic (max. total load 12 tonnes), a suitable engineered slab must be installed preventing loads from being transferred to the tank.

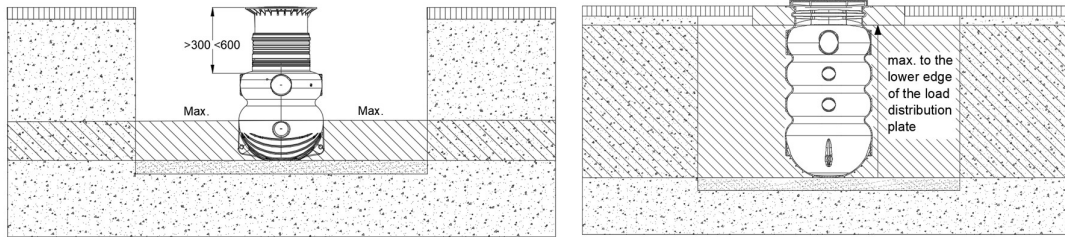
(without groundwater and stratum water)

Cast iron cover (class D) required.



4 Installation and assembly

4.2.5 Combination of pedestrian load and groundwater



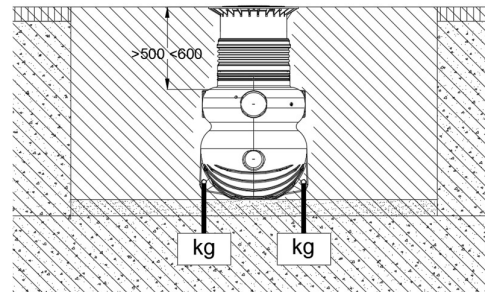
Earth cover requirements for installation in groundwater without the use of ground anchors.

The hatched area indicates the permissible immersion depth of the tank (**only in the green landscape area** - not in connection with areas subjected to traffic).

	600 L	900 L	1200 L	1500 L
Ground cover	0,3 - 0,6 m	0,3 - 0,6 m	0,3 - 0,6 m	0 m
Max. groundwater level	500 m	600 m	900 m	max. to the lower edge of the load distribution plate

If the groundwater is up to the ground surface, ground anchors must be used (**only in green landscape areas** - not adjacent to traffic areas).

A concrete weight is attached to each eyelet using a heavy-duty strap. The concrete weight should be positioned as vertically as possible as shown. The following table must be taken into account when selecting the concrete weight:



	600 L	900 L	1200 L	1500 L
Earth cover	0,5 - 0,6 m	0,5 - 0,6 m	0,5 - 0,6 m	0 m
Weight per concrete One weight must be used per eyelet.	700 kg	880 kg	1300 kg	750 kg

4 Installation and assembly

4.2.6 Combination of traffic load and groundwater

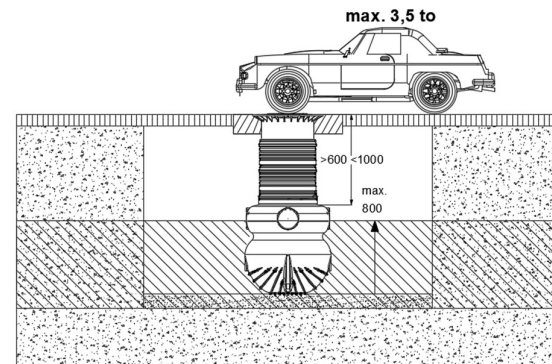
The following maximum combinations of earth cover, traffic load and groundwater level are possible:

Load case 1: Car trafficable and groundwater up to 800 mm

600 litres, 900 litres and 1200 litres:

Earth cover with cast iron cover (class B) in areas with car traffic up to max. 3.5 tonnes with groundwater up to max. 800 mm.

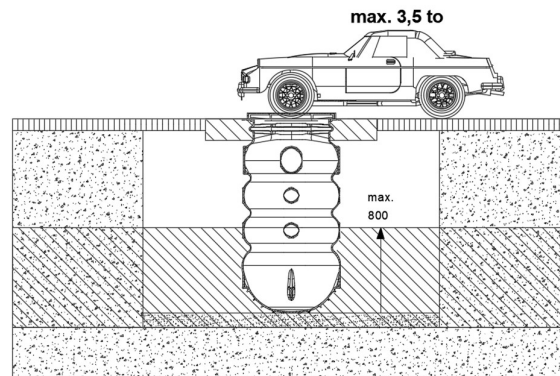
The specifications for the telescopic dome shaft for traffic of cars in chapter 5.2.2. must be observed.



1500 L:

Can be driven on by cars up to max. 3.5 tonnes with groundwater up to max. 800 mm.

The special cover with load distribution plate for the 1500 L tank must be used (see chapter 2.2.).



4 Installation and assembly

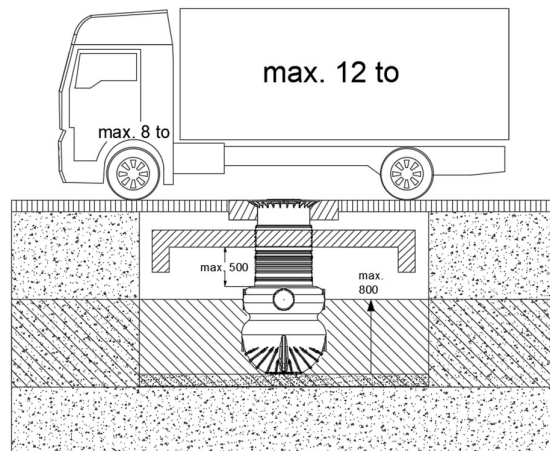
Load case 2: Truck trafficable and groundwater up to 800 mm

600 L, 900 L and 1200 L

Earth cover with cast iron cover (class D) in areas with truck traffic up to max. 12 tonnes with groundwater up to max. 800 mm.

Truck access to the tank is only permitted in conjunction with a statically calculated self-supporting, iron-reinforced concrete bridge.

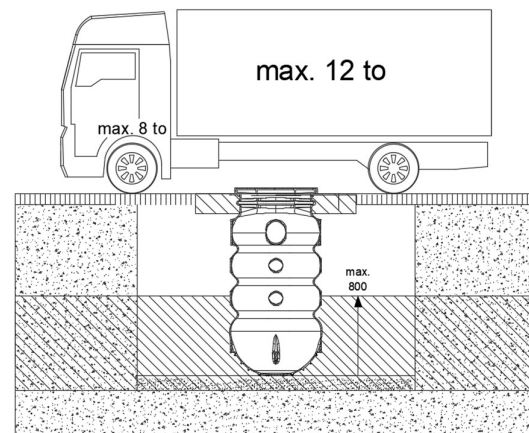
The specifications in chapter 4.3.3. for the cover must be observed.



1500 L

Suitable for trucks up to max. 12 tonnes with groundwater up to max. 800 mm.

The special cover with load distribution plate for the 1500 L tank must be used (see chapter 2.2.).

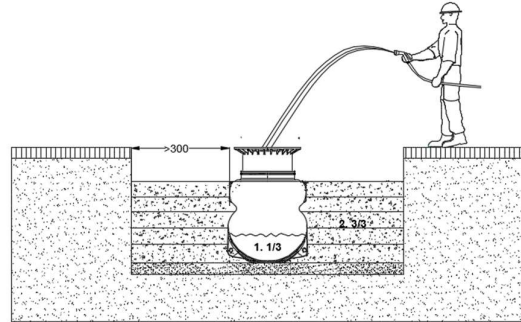


4 Installation and assembly

4.3 Backfilling and cover

The tanks must be inserted into the prepared excavation pit without impact using suitable equipment.

In order to increase the dead weight of the tank during backfilling, the tank is filled 1/3 full with water before backfilling, after which the backfill material (round grain gravel max. grain size 8/16) is placed and compacted in layers in max. 30 cm increments.

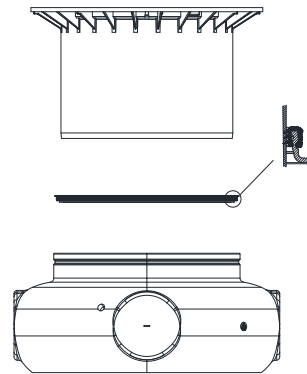


The individual layers, and especially around the lower area of the tank, must be well compacted (hand tamper). Damage to the tank must be avoided during compaction. Mechanical compaction machines must not be used under any circumstances. The working space in the excavation pit must be at least 300 mm.

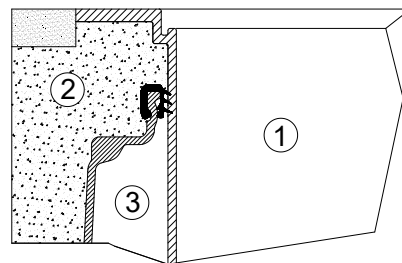
Attention: Particular attention must be paid to tight backfilling around the bottom 1/3 of the tank.

4.3.1 Assembling pedestrian cover

The telescopic shaft allows the manhole to be continuously adjusted to any ground surface between 140 mm and 340 mm (telescopic shaft Mini) or 140 mm and 440 mm (telescopic shaft Maxi). For installation, the profile seal (EPDM material) is generously rubbed with soft soap (do not use lubricants based on mineral oil, as these attack the seal). The telescope is then also greased, inserted and levelled to the ground surface.



To prevent loads from being transferred to the tank, the telescopic shaft ① is backfilled in layers with round grain gravel ② (max. grain size 8/16) and compacted evenly. Damage to the tank ③ or telescopic shaft must be avoided. The cover is then placed on top and the screw on the cover is tightened firmly so that it cannot be opened by a child.



The cover must always be bolted so that it is childproof.

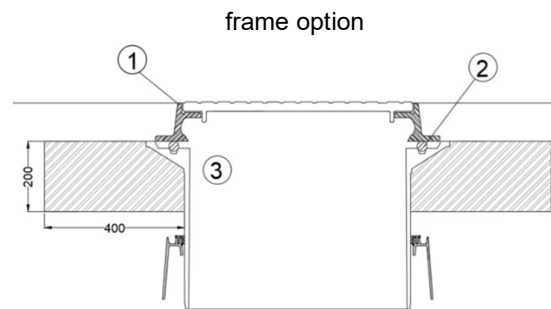
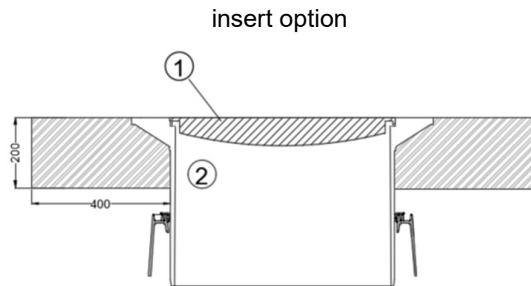
4 Installation and assembly

4.3.2 Assembling cover trafficable by cars (class B)

If the tank is installed in areas with traffic of cars, the telescopic shaft must be cast with concrete (load class B25 = 250 kg/m²) in the collar area. The concrete layer to be filled must be at least 300 mm wide and approx. 200 mm high all around.

The telescopic dome shaft (max. usable length 440 mm) and the intermediate piece (max. usable length 300 mm) are available for deeper installation.

For an insert option, the insert cover ① is placed on top of the telescopic shaft ②. For a frame option, the cover ① sits on a frame. For gas tightness, a seal ② might be included between the frame and the shaft ③.

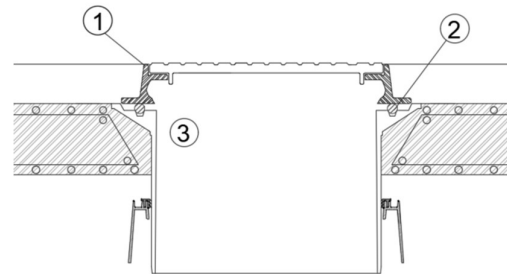


4.3.3 Assembling cover trafficable by trucks (class D)

If the tank is installed in areas with traffic of trucks, the telescope shaft is cast as described in 4.4.2, with reinforcement. The casting frame must have a bearing surface of approx. 1 m².

The telescopic dome shaft (max. usable length 440 mm) and the intermediate piece (max. usable length 300 mm) are available for deeper installation.

Caution: Only suitable for traffic of trucks in conjunction with a self-supporting, iron-reinforced concrete bridge.

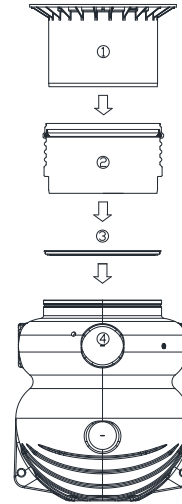


4 Installation and assembly

4.4 Fitting the intermediate piece

For deeper installations, an intermediate piece, also known as extension riser, is available. Risers can be stacked given that the maximum earth cover requirements for the site conditions are not exceeded. The riser is placed on top of the tank seal. The profile seal is inserted into the top groove of the intermediate piece and generously greased. Then insert the telescopic dome shaft and adjust it to the planned ground surface.

- ① Telescopic dome shaft (can be tilted by 5°)
- ② Intermediate piece or extension riser (300mm)
- ③ Tank seal
- ④ Superstrong tank



5. Inspection and maintenance

The entire system must be checked for leaks, cleanliness and stability at least every three months.

The entire system should be serviced at intervals of approx. 5 years. In this case, all parts of the system must be cleaned and their function checked. Servicing should be carried out as follows:

- Drain the tank completely
- Clean surfaces and internal parts with water
- Remove all dirt from the tank
- Inspect internal parts that might be present

It is recommended to flush pipework during maintenance.

Servicing intervals may change due to the tank use and application, please liaise with the relevant local authority.