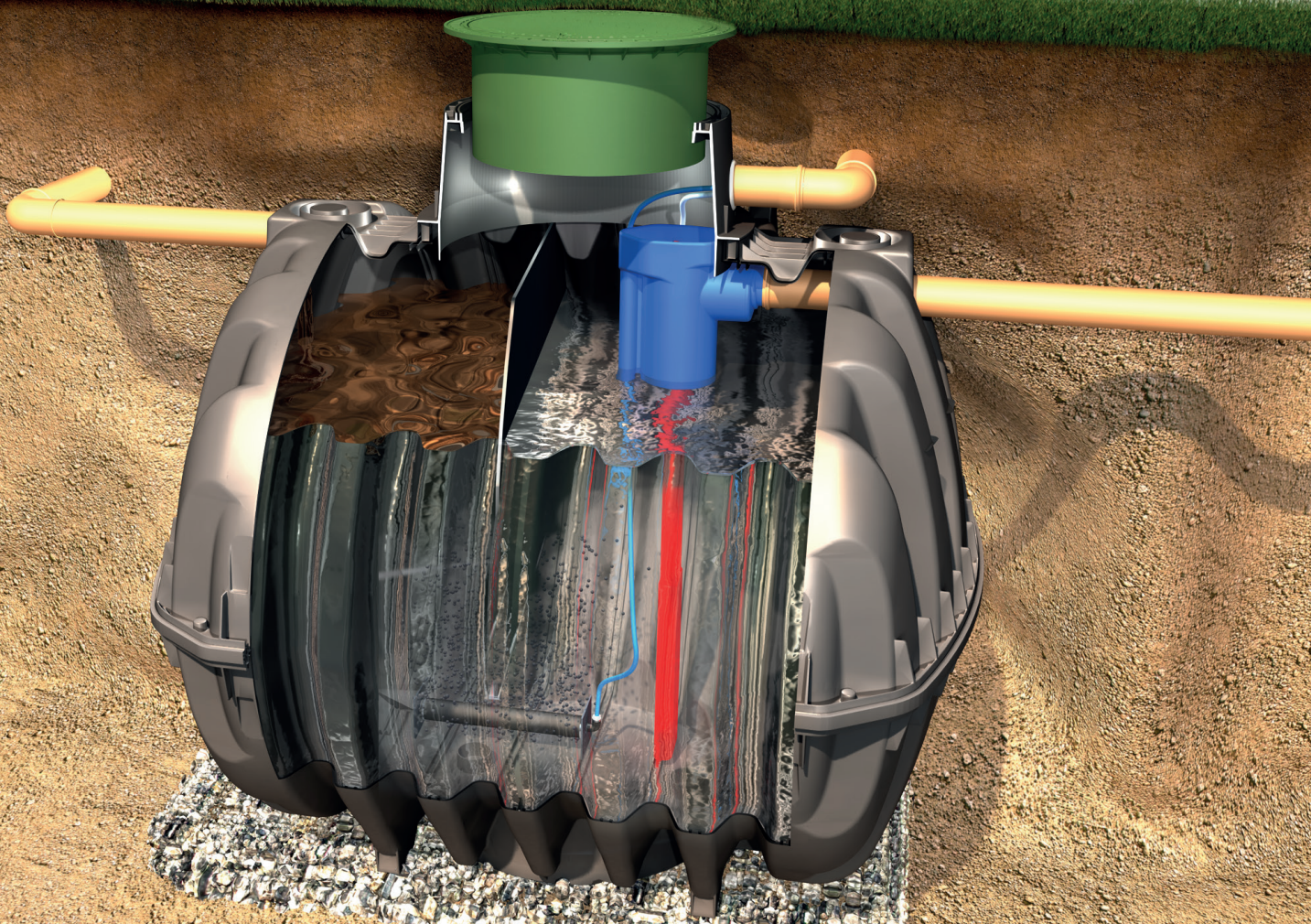




# IMPORTANT READ ME

## Installation manual for Carat underground tank

ONE2CLEAN TANKS



### Safety

The relevant accident prevention regulations must be observed during all work. Particularly when walking on the tanks, a 2nd person is required to secure the tank.

The relevant regulations and standards must additionally be taken into consideration during installation, assembly, servicing, repair, etc.

The system or individual parts of the system must be installed by qualified specialists.

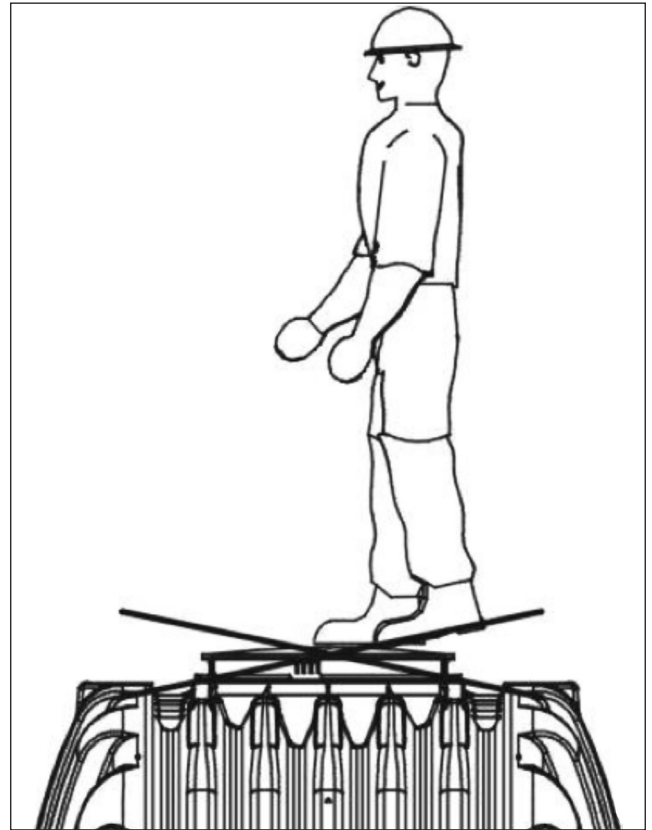
During all work on the system or parts of the system, the entire system must always be rendered inoperable and secured to prevent unauthorised reactivation. Except in the event of work carried out in the tank, the cover of the tank must always be kept sealed, as this otherwise constitutes a maximum risk of accident. Only original GRAF covers or covers approved in writing by GRAF must be used.

GRAF offers an extensive range of accessories, all of which are designed to match each other and which can be extended to form complete systems.

The use of other accessories may lead to impediments to the system's functional capability, therefore invalidating liability for resulting damage.

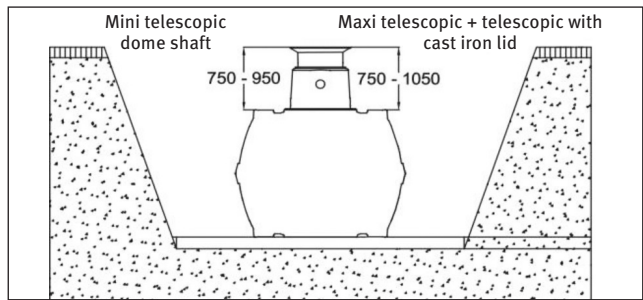
### Identification obligation

All service water pipes and outlets must be identified in writing with the words **"Not drinking water"** or in the form of images in order to avoid inadvertent connection with the drinking water mains even after a number of years. Mix-ups, e.g. by children, may still occur even in the case of correct identification. All service water extraction points must therefore be installed with valves with **child-proof locks**.

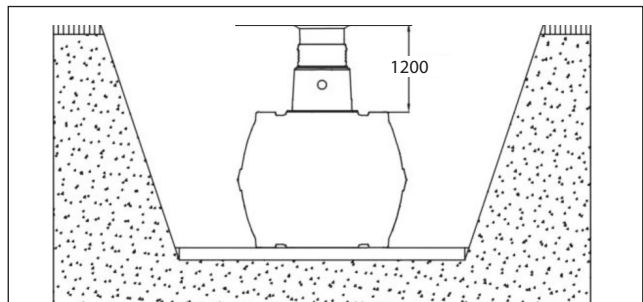


## 2 Installation conditions

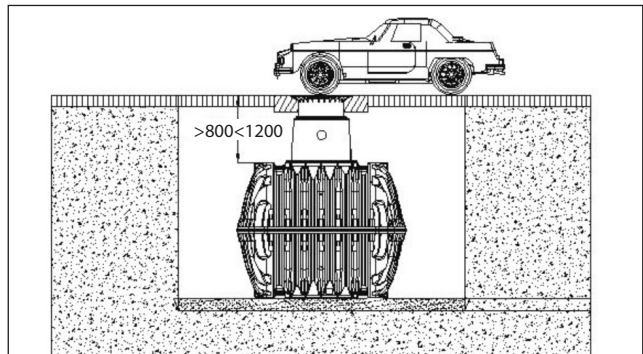
Coverage heights with telescopic dome shaft in green areas.



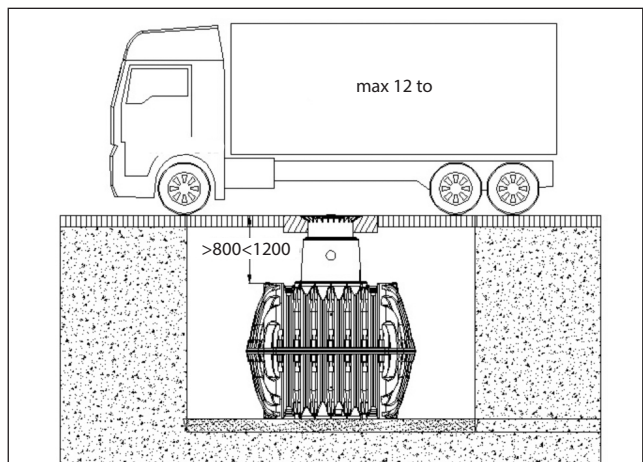
Maximum coverage heights with extensions and telescopic dome shaft.



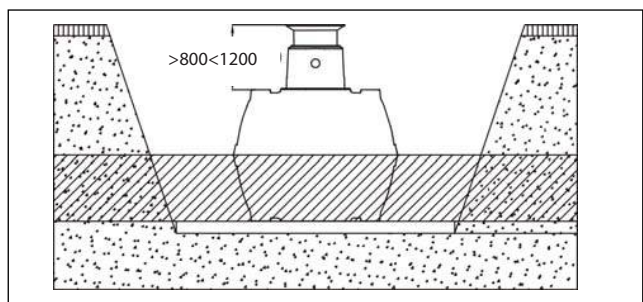
Covering heights with cast telescopic dome shaft (with class B cast cover) in areas with car traffic (load up to 3.5 t).



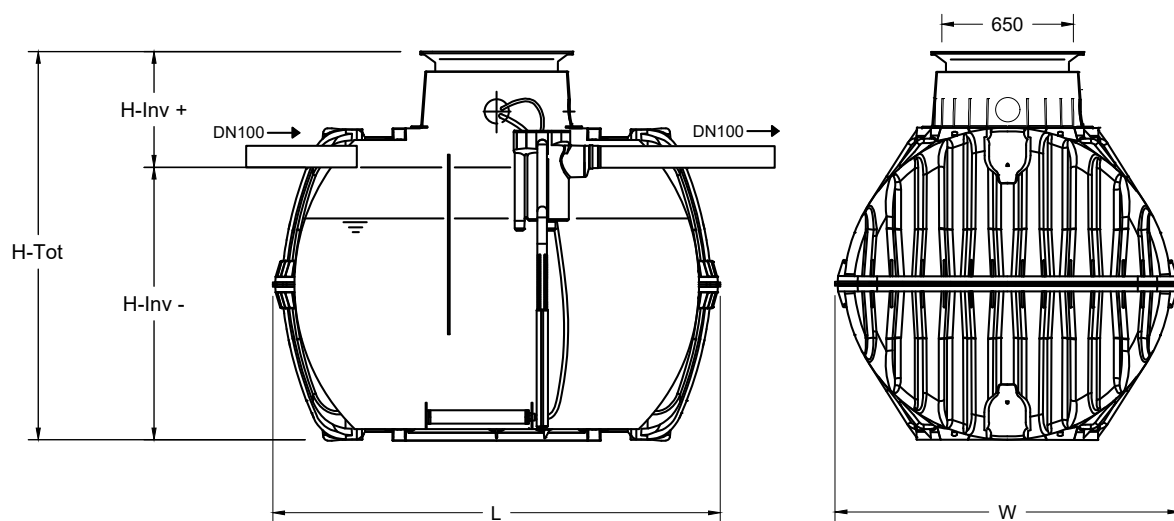
Coverage heights with vehicle loading cover (suitable cover to be provided by others) in areas used by trucks with a max. weight of 12 t.



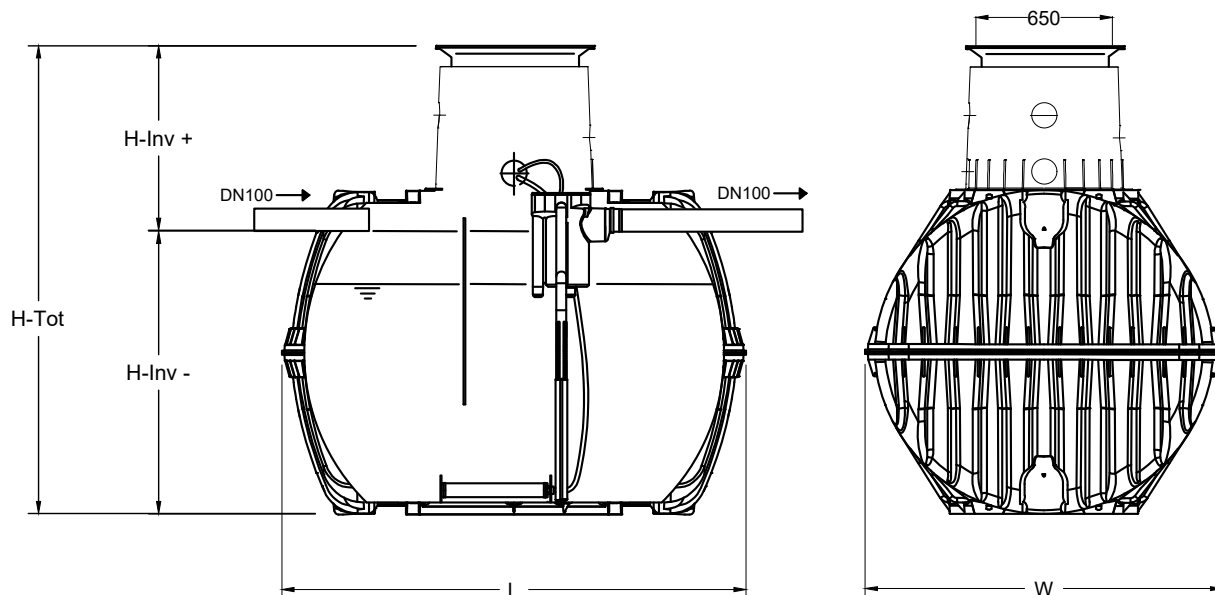
Coverage heights on installation in groundwater the hatched area specifies the permissible immersion depth for the tanks.



## With mini tank dome



## With maxi tank dome

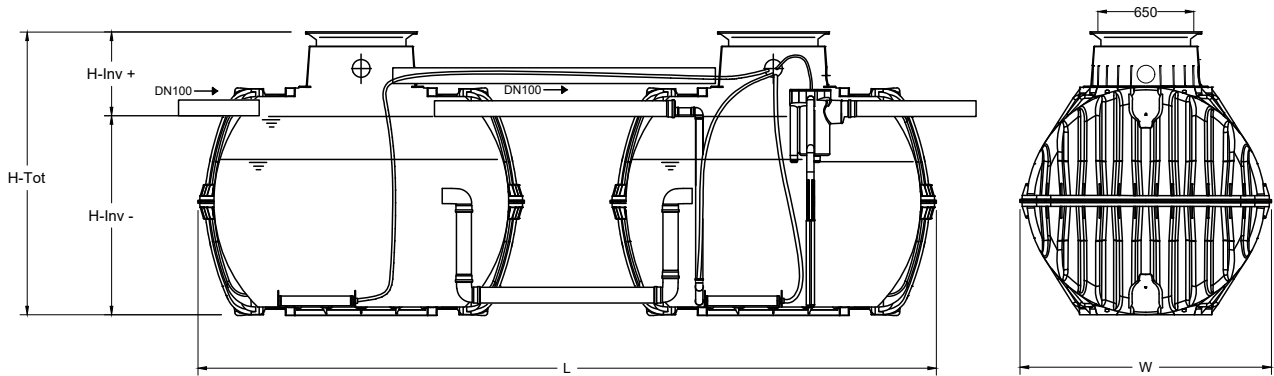


\* Various inlet options available to suit installation. Please specify invert depth required when ordering.

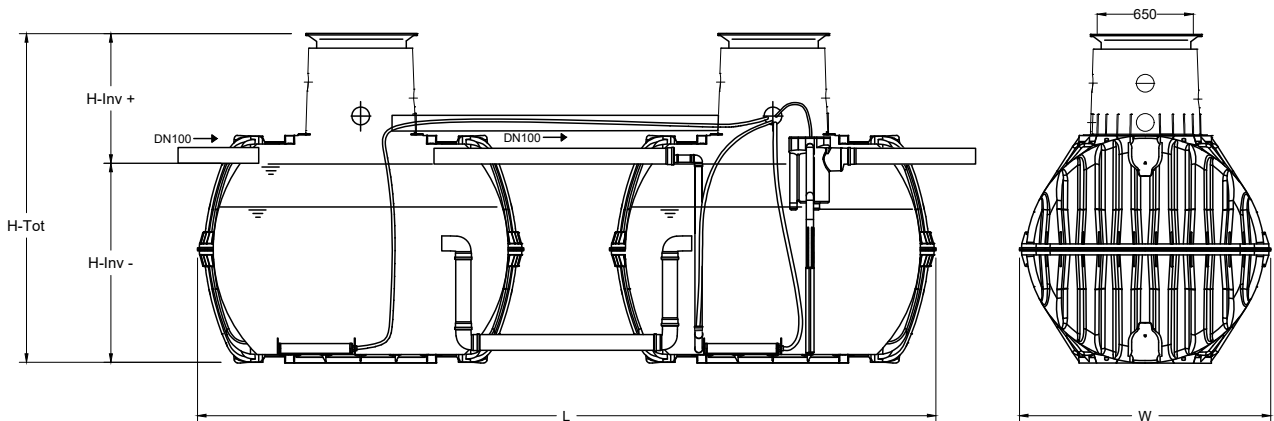
Population Equivalent	5 PE	7 PE	9 PE
<b>Tank</b>	3750 litres	4800 litres	6500 litres
<b>Max. daily inflow</b>	750 l/d	1050 l/d	1350 l/d
<b>Weight with mini tank dome</b>	146kg	181kg	220kg
<b>Weight with maxi tank dome</b>	150kg	185kg	220kg
<b>L</b>	2280mm	2280mm	2390mm
<b>W</b>	1755mm	1985 mm	2190mm
<b>H-Inv -</b>	1390mm	1575mm	1840mm
<b>H-Inv + *</b>	630 to 1400mm	675 to 1445mm	690 to 1460mm
<b>H-Tot</b>	2020 to 2790mm	2250 to 3020mm	2530 to 3300mm

### 3b Tank invert levels

#### With mini tank dome



#### With maxi tank dome

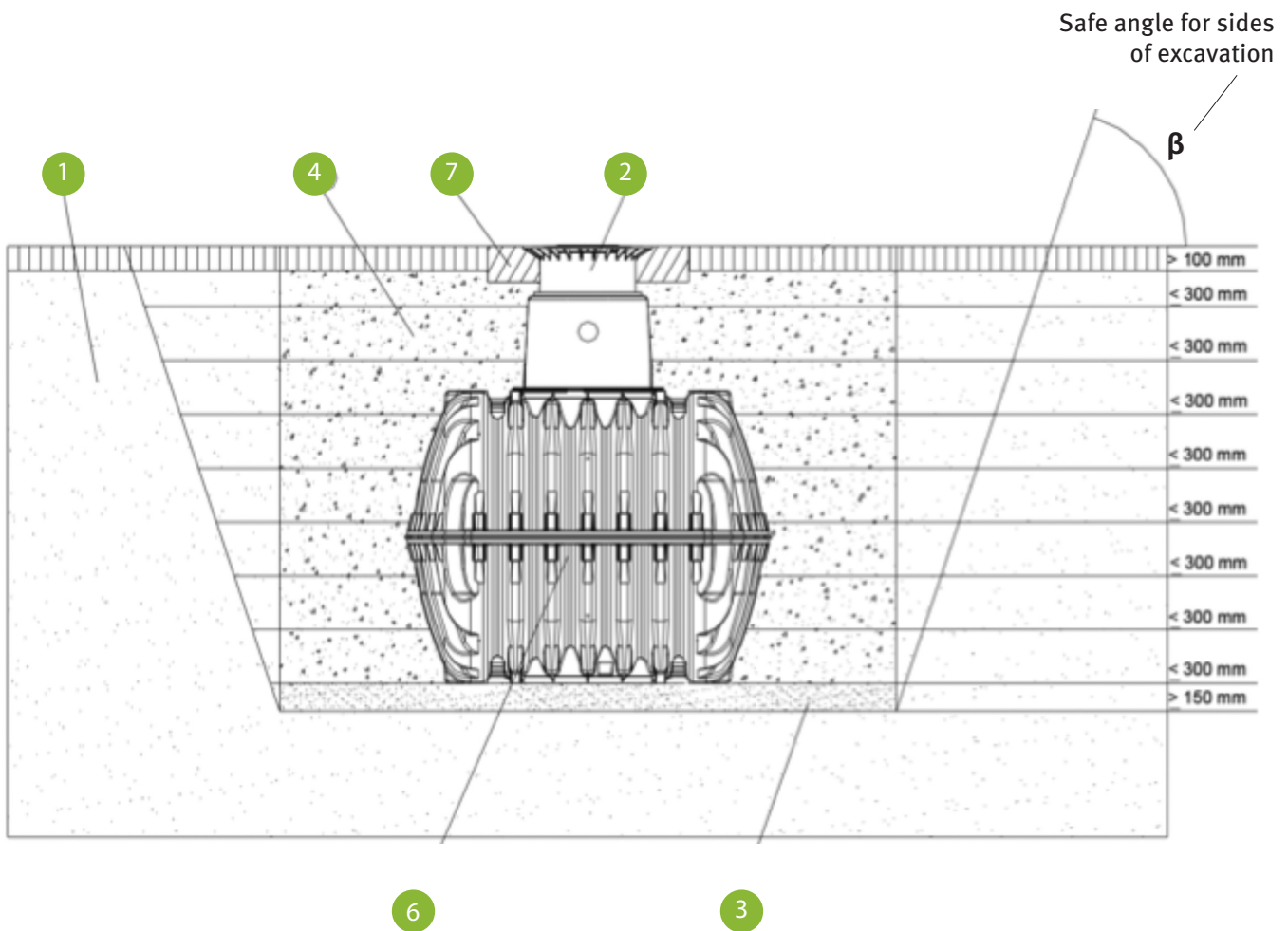


\* Various inlet options available to suit installation. Please specify invert depth required when ordering.

Population Equivalent	10 PE	14 PE	18 PE
<b>Tank</b>	2x3750 litres	2x4800 litres	2x6500 litres
<b>Max. daily inflow</b>	1500 l/d	2100 l/d	2700 l/d
<b>Weight with mini tank dome</b>	300kg	370kg	448kg
<b>Weight with maxi tank dome</b>	308kg	378kg	456kg
<b>L</b>	5060mm	5060mm	5280mm
<b>W</b>	1755mm	1985 mm	2190mm
<b>H-Inv -</b>	1390mm	1575mm	1840mm
<b>H-Inv + *</b>	630 to 1400mm	675 to 1445mm	690 to 1460mm
<b>H-Tot</b>	2020 to 2790mm	2250 to 3020mm	2530 to 3300mm

## 4 Tank installation

1. Subsoil
2. Telescopic dome shaft
3. Compact foundation
4. Surrounding (round-grained gravel, maximum grain size 10 to 20mm)
5. Covering layer
6. Carat underground tank
7. Concrete layer for surfaces used by passenger cars



### Trench

To ensure that sufficient space is available for working, the base area of the trench must exceed the dimensions of the tank by 500mm on each side; the distance from solid constructions must be at least 1000mm.

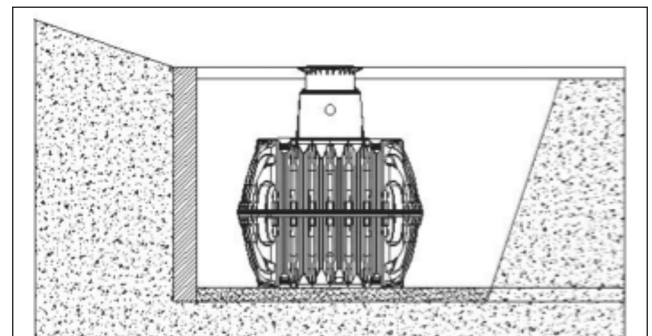
The trench embankment must be designed so that slippage or collapse of the embankment wall is not to be anticipated. The construction site must be horizontal and plane and must guarantee sufficient loadbearing capacity.

The depth of the trench must be dimensioned so that the max. earth coverage (see point 2 installation conditions) above the tank is not exceeded. To use the system throughout the entire year, it is necessary to install the tank and those parts of the system which conduct water in the frost-free area. The frost-free depth is usually approx. 600mm to 800mm; precise information in this regard can be obtained from the responsible authority.

A layer of compacted, round-grain gravel (grain size 10 to 20mm, thickness approx. 150 - 200mm) is applied as the foundation.

### Slope, embankment, etc.

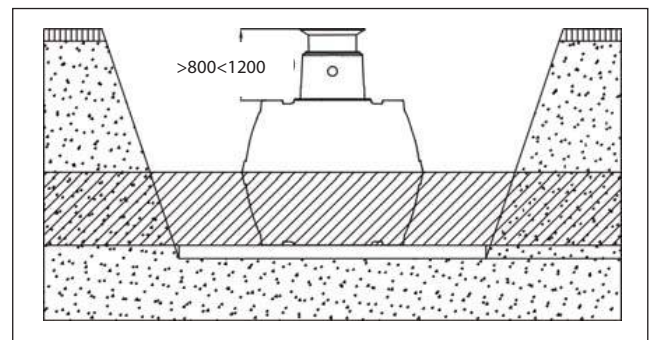
On installation of the tank in the immediate vicinity (< 5m) of a slope, earthen mound or slope, a statically calculated supporting wall must be erected to absorb the soil pressure. The wall must exceed the dimensions of the tank by at least 500mm in all directions, and must be located at least 1000mm away from the tank.



### Groundwater and cohesive (water-impermeable) soils (e.g. clay soil)

If it is anticipated that the tanks will be immersed deeper into the groundwater than is shown in the adjacent figure, sufficient dissipation must be ensured. (See table for max. immersion depth).

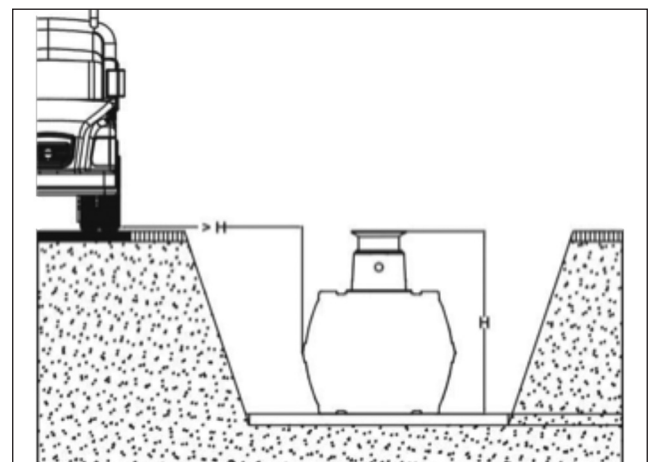
Dissipation of the drainage water (e.g. via an annular drainage system) is recommended in the case of cohesive, water-impermeable soils.



Population Equivalent	5 PE	7 PE	9 PE
Tank size	3750	4800 L	6500
Immersion depth	795mm	910mm	1050mm

### Installation adjacent to surfaces used by vehicles

If the underground tanks are installed adjacent to surfaces which are used by vehicles heavier than passenger cars, the minimum distance away from these surfaces is at least the depth of the trench.

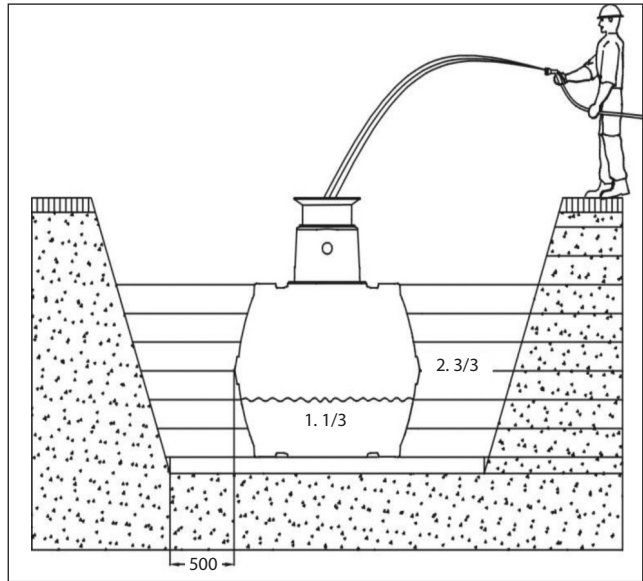


## 4 Tank installation

### Insertion and filling

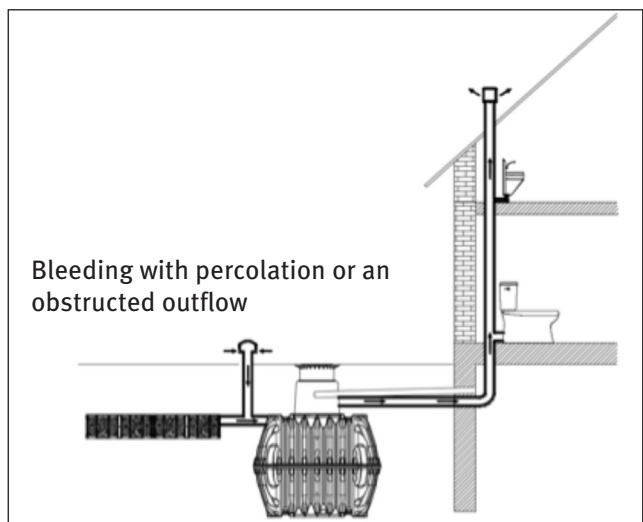
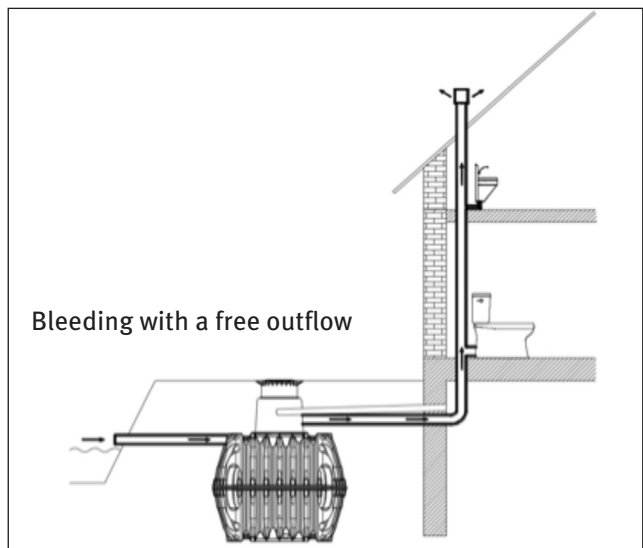
The tanks must be inserted, impact-free, into the prepared trench using suitable equipment. The tank is filled with  $\frac{1}{3}$  water before starting to backfill.

Afterwards the surrounding (roundgrain gravel, max. grain size 10 to 20mm) is then filled in layers of max. 30 cm steps and is compacted. The individual layers should be manually tampered to ensure no voids. Damage to the tank must be avoided during compaction. Mechanical compaction machines must not be used under any circumstances. The surrounding must be at least 500mm wide.



### Ventilation and bleeding

Poor venting and the lack of a Soil Vent Pipe is the number one cause of smells from treatment plants. All tanks must be ventilated and bled back through the soil vent pipe (chimney effect). Air Admittance Valves (Durgo Valves) must not be used instead of the SVP. These valves are fine for houses connected to mains drainage but NOT for ones with a treatment plant.



### Assembling the telescopic dome shaft

The telescopic dome shaft enables infinite adaptation of the tank to given site surfaces with earth coverage of between 750mm and 950mm (Mini telescopic dome shaft) or 750mm and 1050mm (Maxi telescopic dome shaft).

For assembly purposes, the enclosed profile seal (material EPDM) is inserted into the tank dome's sealing groove and is coated generously with soft soap (do not use mineral oil-based lubricants, as these attack the seal). The telescope is then greased, inserted and aligned with the surface of the site.

### Telescopic dome shaft on which persons may walk

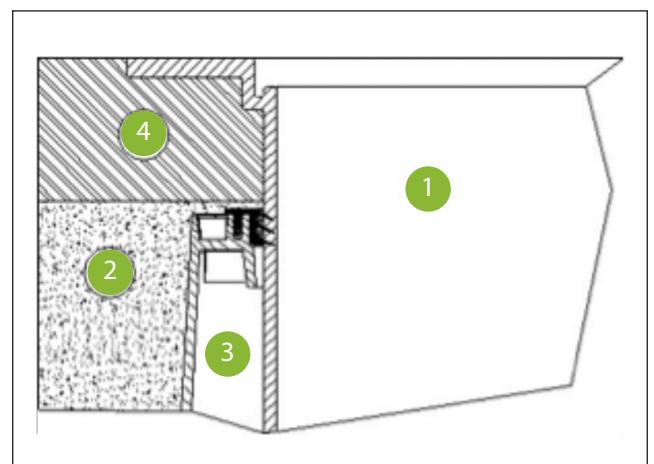
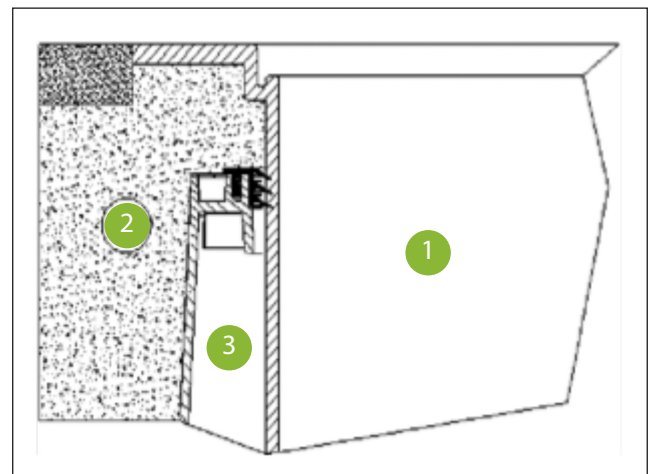
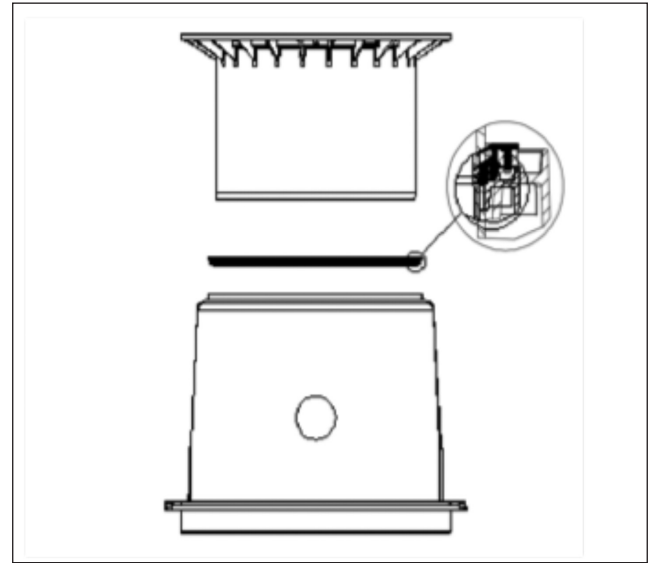
**Important:** To prevent loads from being transferred onto the tank, round-grain gravel 1 (max. grain size 10 to 20mm) is filled in in layers around the telescope 2 and is evenly compacted.

Damage to the tank dome 3 and telescope must be avoided during this step. The cover is then positioned and is sealed to prevent entry by children. **Tighten the threaded connection on the cover so tightly that it cannot be opened by a child!**

### Telescopic dome shaft over which passenger cars may drive

If the tank is installed under areas used by passenger cars, the collar area of the telescope 1 (colour anthracite) must be supported with concrete 4 (load class B25 = 250 kg/m<sup>2</sup>). The layer of concrete to be installed must be at least 300mm wide and approx. 200 mm high all around. The minimum coverage above the shoulder of the tank is at least 800mm (max. 1050mm with telescope, coverage up to max. 1200mm possible with intermediate section).

**Attention:** It is essential to use the cast telescopic dome shaft (with class B cast cover).



## 4 Tank installation

### Assembling the extension

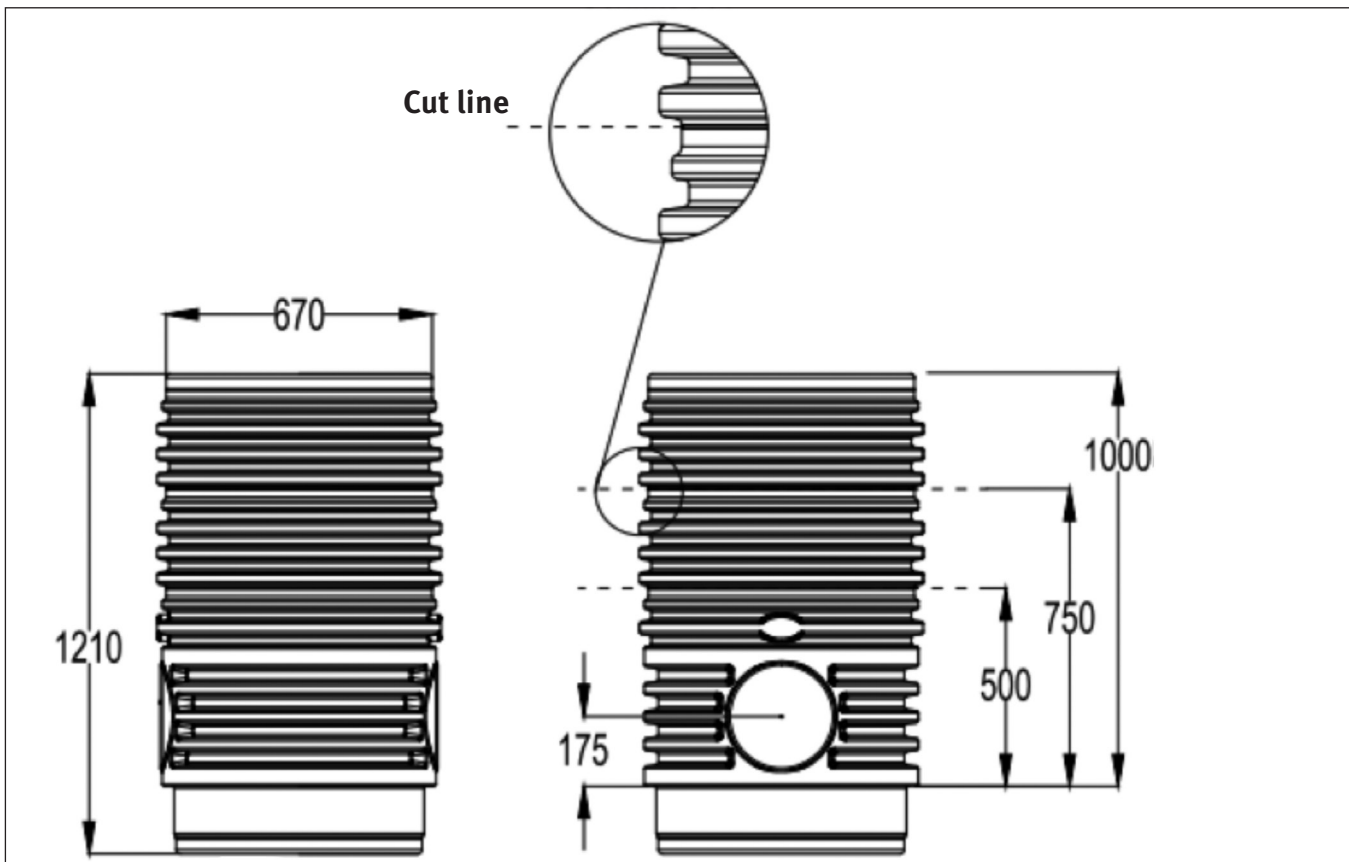
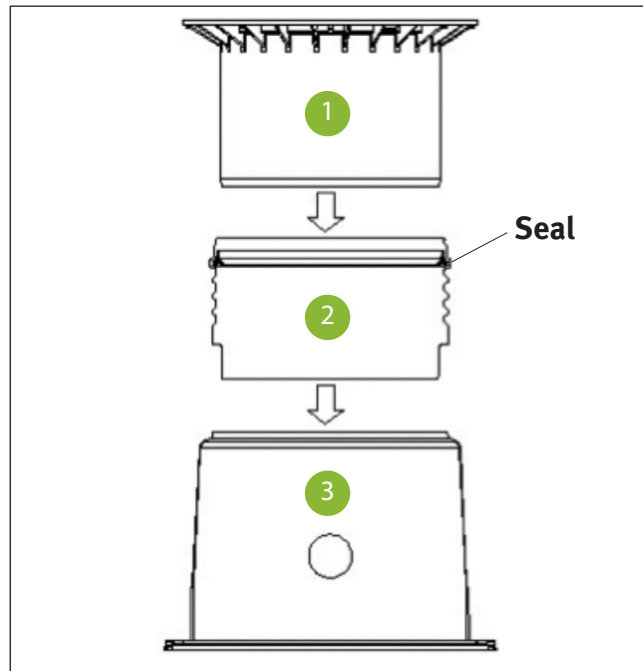
For larger coverage heights an extension is needed. To insert the extension into the tank dome, soft soap is needed. Into the highest groove of the extension the profile seal is inserted and greased generously. Afterwards push the telescopic dome shaft into the extension and adapt it to the planned area surface. The extension must not be cut down.

1 Extension = max. earth-cover 1200mm  
(in each case in connection with the Maxi telescopic dome shaft)

1 Telescopic dome shaft (can be inclined by 5°)

2 Extension

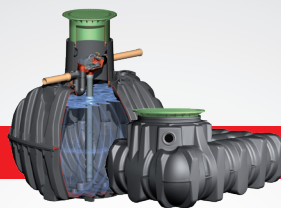
3 Tank dome (can be rotated by 360°)



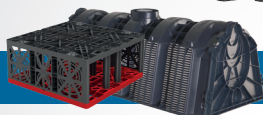




## RAINWATER HARVESTING



## INFILTRATION



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