



## Graf Site Specific Wastewater Treatment Recommendation

<b>Client:</b> Will Lynch
<b>Site Address:</b> Coolmine Saggart Co Dublin
<b>Population Equivalent:</b> 7 PE
<b>Sub surface Test Value:</b> 32
<b>Surface Test Value:</b> 21
<b>Proposed Solution:</b> Graf One 2 Clean 7PE Wastewater Treatment Plant with Pumped discharge followed by a 105m2 Soil Polishing Filter.

Included in this Report:  
EN12566-3 Sr6.6 certification  
One 2 Clean drawing  
One 2 Clean installation manual  
Optional maintenance agreement

### Graf Ireland

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## Graf Site Specific Wastewater Treatment Recommendation

### System Proposal:

Based on the Information provided, we recommend for your site a Graf One 2 Clean 7pe Wastewater treatment plant which is designed to treat up to 1050 Litres of Wastewater per day. This is based on the EPA Code of Practice loading rate of 150 Litres/Person per day. The Graf One 2 Clean is manufactured in accordance with EN12566-3 and fully complies with SR66.

Based on a Sub surface value of 32 Final Discharge of the effluent to the ground will be via a Pumped Outlet to a 1055m<sup>2</sup> Soil polishing Filter as per EPA code of practice. Systems to be installed as per chapters 8 & 9 and Section 10.1 of the code of practice

Table 10.1: Infiltration/treatment area and trench length design for tertiary treatment, per PE

Percolation values (PVs)	Pumped or underlying gravity discharge (Options 1 and 2)	Gravity discharge into 300 mm wide trenches (Option 3)	Low pressure pipe distribution into 300 mm wide trenches (Option 4)	Drip dispersal system (Option 5)	Tertiary infiltration area (Option 6)
	Area required per person (m <sup>2</sup> )	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m <sup>2</sup> )	Area required per person (m <sup>2</sup> )
3 ≤ PV ≤ 20	≥75	≥6	≥6	≥5	≥3.75
21 < PV ≤ 40	≥15	≥12	≥12	≥14	≥7.5
41 < PV ≤ 50	≥30	≥17	≥17	≥16	≥15
51 < PV ≤ 75	≥50	≥19	≥19	≥22	≥25
76 < PV ≤ 90	—	—	≥28	≥34	—
91 < PV ≤ 120	—	—	—	≥54	—

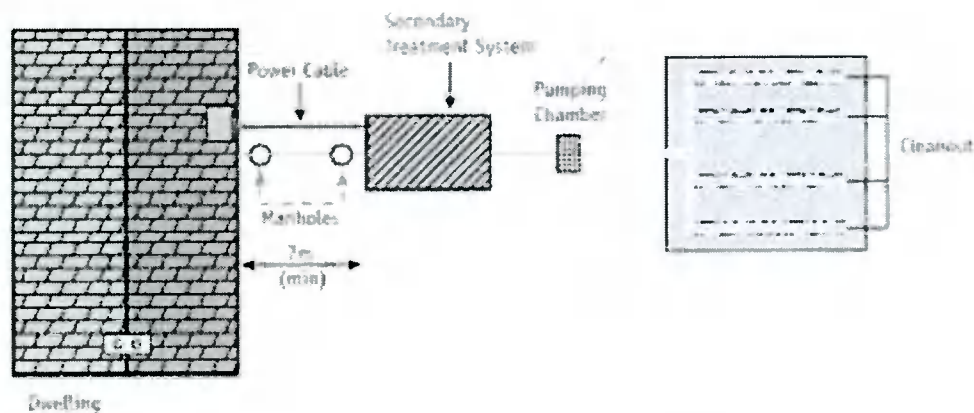


Figure 10.1: Example of a typical low-pressure pipe distribution system

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Graf Site Specific Wastewater Treatment  
Recommendation

7



TREATMENT PERFORMANCE RESULTS

Otto Graf GmbH  
Carl-Zeiss-Str. 2-6, 79331 Teningen

EN 12566-3

Results corresponding to EN 12566-3 and S.R. 66

PIA-SR66-1605-1061

one2clean

SBR plant in one two-zone polypropylene tank

Nominal organic daily load	0.27 kg/d															
Nominal hydraulic daily load	0.78 m <sup>3</sup> /d															
Material	Polypropylene															
Watertightness	Pass															
Structural behaviour (Pi Test)	Pass (also wet conditions)															
Durability	Pass															
Treatment efficiency (nominal sequences)	<table border="0"> <tr> <td></td> <td>Efficiency</td> <td>Effluent</td> </tr> <tr> <td>COD</td> <td>94.2 %</td> <td>43 mg/l</td> </tr> <tr> <td>BOD<sub>5</sub></td> <td>98.0 %</td> <td>7 mg/l</td> </tr> <tr> <td>NH<sub>4</sub>-N</td> <td>98.3 %</td> <td>0.5 mg/l</td> </tr> <tr> <td>SS</td> <td>96.3 %</td> <td>14 mg/l</td> </tr> </table>		Efficiency	Effluent	COD	94.2 %	43 mg/l	BOD <sub>5</sub>	98.0 %	7 mg/l	NH <sub>4</sub> -N	98.3 %	0.5 mg/l	SS	96.3 %	14 mg/l
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NH <sub>4</sub> -N	98.3 %	0.5 mg/l														
SS	96.3 %	14 mg/l														
Number of desludging	Not more than once															
Electrical consumption	0.63 kWh/d															

Performance tested by:

**PIA – Prüfinstitut für Abwassertechnik GmbH**  
(PIA GmbH)  
Hergenrather Weg 30  
52074 Aachen, Germany

This document replaces neither the declaration of performance nor the CE marking



Nordtec Body  
No. 1726



Certified according to  
ISO 9001:2008



DAKKS

Zentrale  
Abmahnungsstelle  
0-90-37711-01 08

Prüfinstitut für Abwassertechnik GmbH

*Elmar Lance*  
geprüft - tested - tested

Elmar Lance

July 2016

**Graf Ireland**

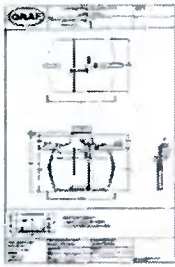
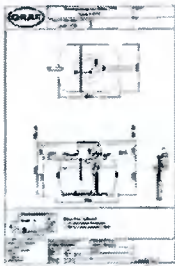
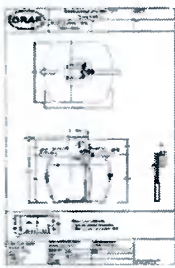
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## Graf Site Specific Wastewater Treatment Recommendation



One2clean range and its referring test reports:

Population Equation (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
Initial type test (ITT) 5		Pass PIA2008-WD-AT0805-1027b	Pass PIA2014-216B14.01	Pass For wet ground conditions also. Installation depth 1.65 m from inlet invert	Pass SKZ 114836/15
3		Pass PIA2008-WD-AT0805-1027b	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also. Installation depth 1.65 m from inlet invert	Pass SKZ 114836/15
7		Pass PIA2008-WD-AT0805-1027b	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also. Installation depth 1.65 m from inlet invert	Pass SKZ 114836/15




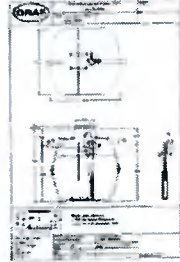

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## Graf Site Specific Wastewater Treatment Recommendation



Population Equation (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
7		Pass  PIA2008-WD-AT0805-1027b	Pass  Range conformity according to S.R. 66.2015	Pass  For wet ground conditions also, Installation depth 1.65 m from inlet invert	Pass  SKZ 114836/15
9		Pass  PIA2008-WD-AT0805-1027b	Pass  Range conformity according to S.R. 66.2015	Pass  PIA2016-ST-PIT-1509-1050.01  For wet ground conditions also, Installation depth 1.65 m from inlet invert	Pass  SKZ 114836/15
10		Pass  PIA2008-WD-AT0805-1027b	Pass  Range conformity according to S.R. 66.2015	Pass  For wet ground conditions also, Installation depth 1.65 m from inlet invert	Pass  SKZ 114836/15



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# Graf Site Specific Wastewater Treatment Recommendation



	<b>Kleinklaranlage one2clean 7 EW</b> <b>Carat S 4800 L</b>		Artikel- artikel no.
	für für WTP one2clean 7 inhab. Carat S 4800 L	ES	FR
		<b>Maxi Dom (optional)</b> • 330 mm höhere Einbaulefe • 330 mm more excavation depth	
<b>Otto Graf GmbH</b> Carl-Zeiss-Str. 2-4 DE-76331 Tengen Germany info@graf.info www.graf.info	<b>Zeichnungsinformation</b> drawing information gezeichnet drawn Datum date Toleranz tolerance	<b>Artikelinformation</b> article information Zeichnung drawing	Alle Maßangaben in mm all dimensions in mm



PIA SR65-1605-1061

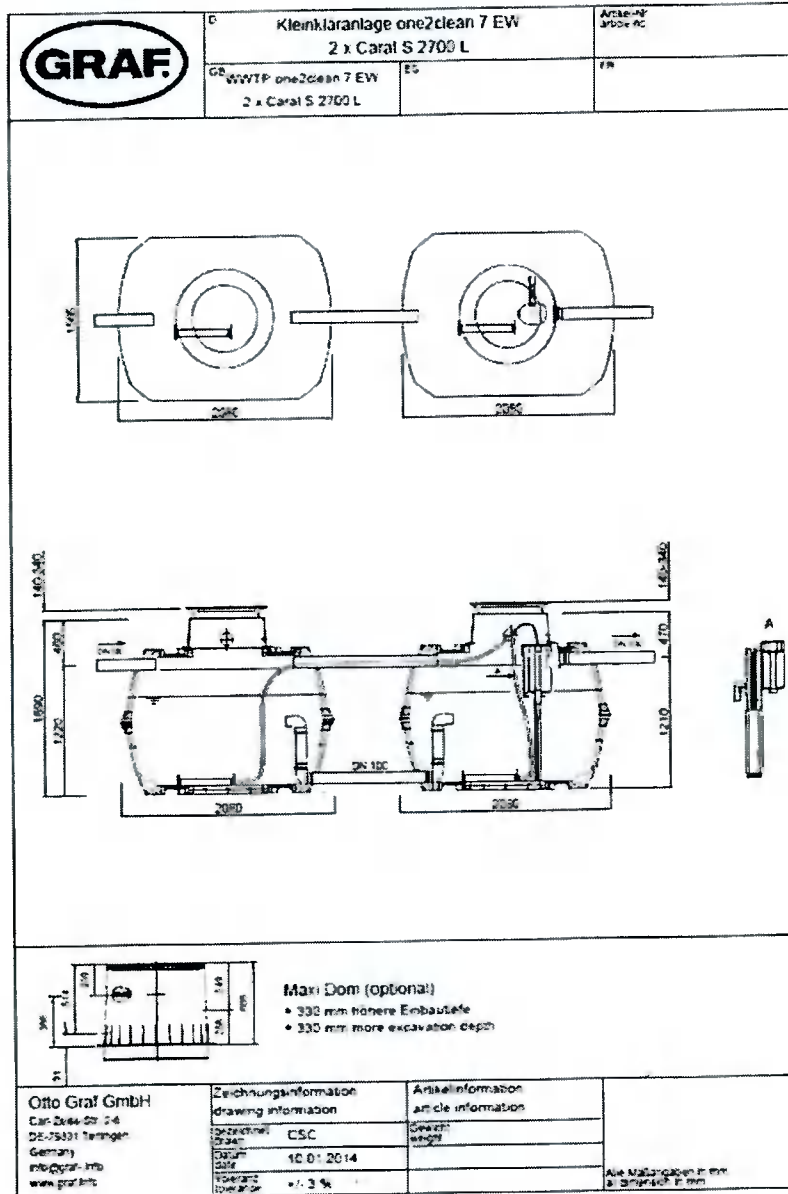
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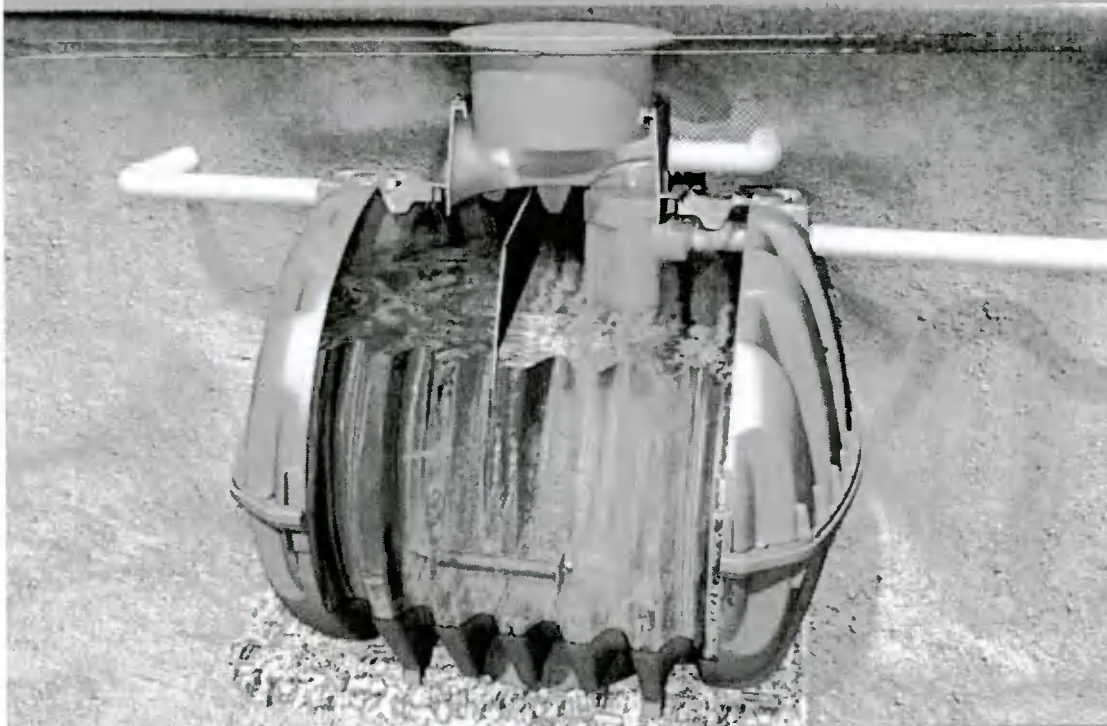
Graf Site Specific Wastewater Treatment  
Recommendation



# IMPORTANT READ ME

Installation manual for  
Carat underground tank

ONE2CLEAN TANKS



Document No: Graf-4003 Rev: 1

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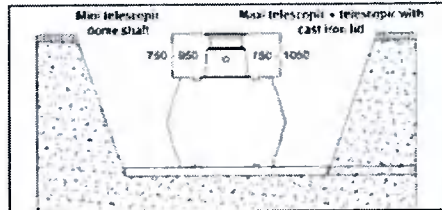




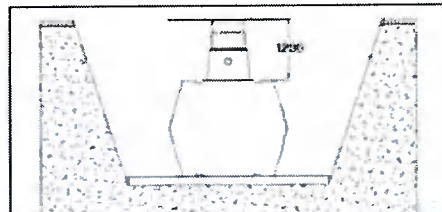
# Graf Site Specific Wastewater Treatment Recommendation

## 2 Installation conditions

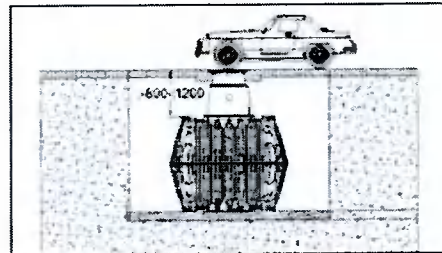
Coverage heights with telescopic dome shaft in green areas.



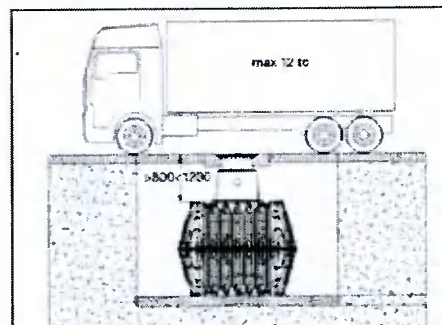
Maximum coverage heights with extensions and telescopic dome shaft.



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

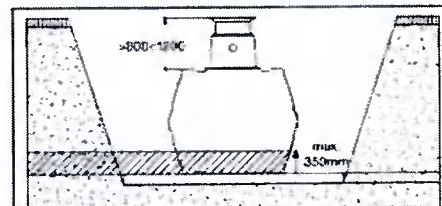


Coverage heights with vehicle loading cover (suitable cover to be provided by others) in areas used by trucks with a max. weight of 12 t.



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

The immersion depth is 350 mm.



Installation conditions

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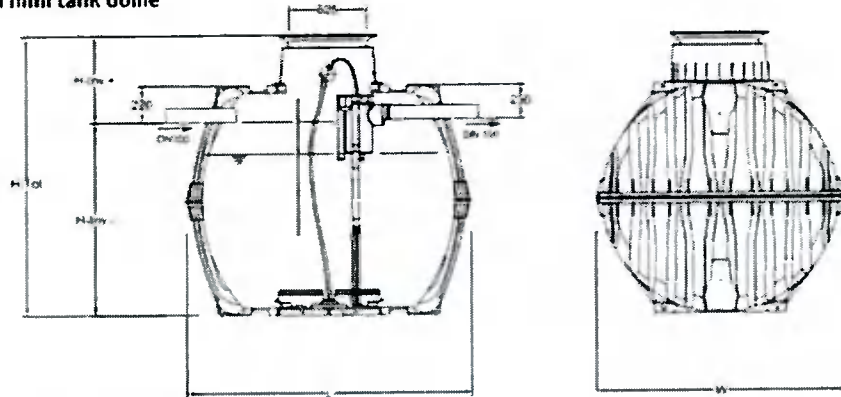


## Graf Site Specific Wastewater Treatment Recommendation

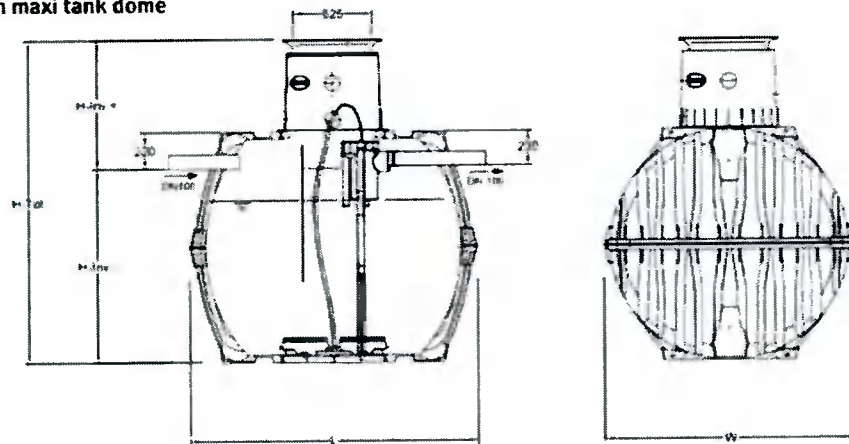
3. Tank invert levels

### 3 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	5 PE	7 PE	9 PE
Tank	3750 litres	4800 litres	6500 litres
Max. daily inflow	750 l/d	1050 l/d	1350 l/d
Weight with mini tank dome	146kg	181kg	220kg
Weight with maxi tank dome	150kg	185kg	220kg
L	2280mm	2280mm	2390mm
W	1755mm	1985 mm	2190mm
H-Invt-	1370mm	1600mm	1880mm
H-Invt+ *		650 to 1420mm	
H-Tot	2020 to 2790mm	2250 to 3020mm	2530 to 3300mm

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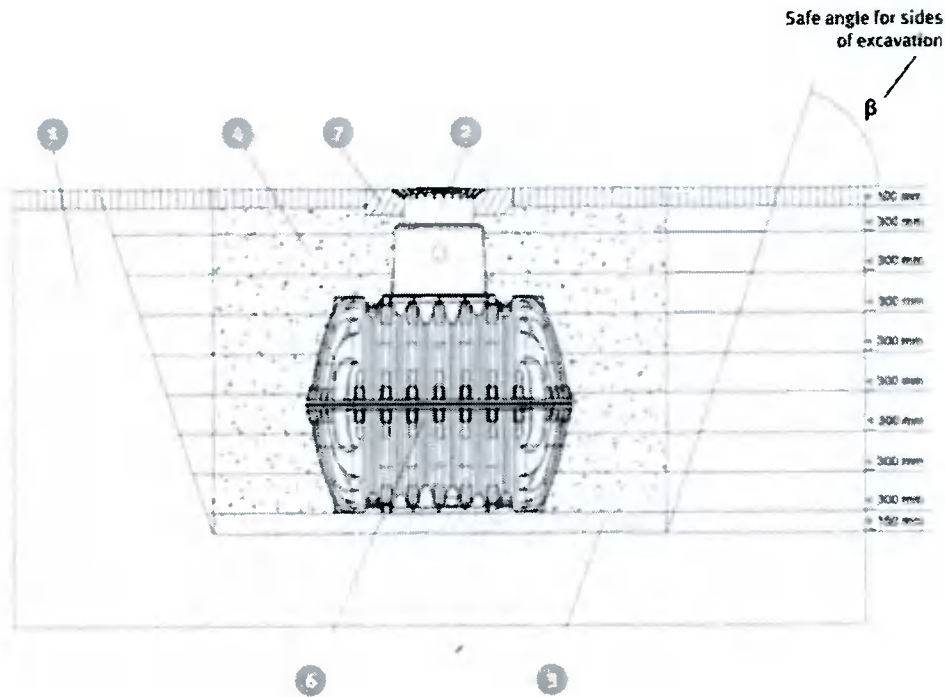
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# Graf Site Specific Wastewater Treatment Recommendation

## 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



A Tank Installation



# Graf Site Specific Wastewater Treatment Recommendation

4. Tank installation

## 4 Tank installation

### 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.

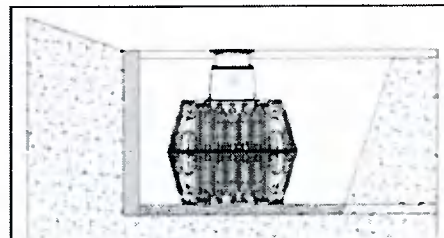
The trench embankment must be designed so that slippage or collapse of the embankment wall is not to be anticipated. The construction site must be horizontal and plane and must guarantee sufficient loadbearing capacity.

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.

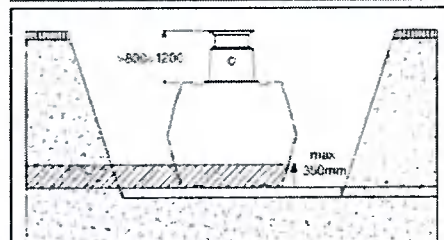
On installation of the tank in the immediate vicinity (< 5m) of a slope, earthen mound or slope, a statically calculated supporting wall must be erected to absorb the soil pressure. The wall must exceed the dimensions of the tank by at least 500mm in all directions, and must be located at least 1000mm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

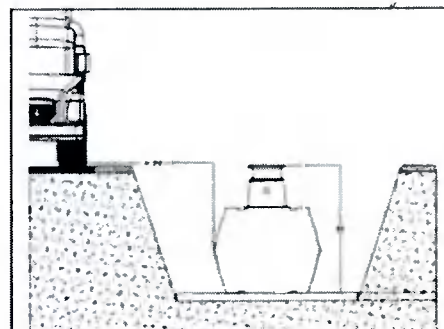
Dissipation of the drainage water (e.g. via an annular drainage system) is recommended in the case of cohesive, water-impermeable soils.



Population Equivalent	5 PE	7 PE	9 PE
Tank size	3750	4800 L	6500
Immersion depth	350mm	350mm	350mm

### 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.





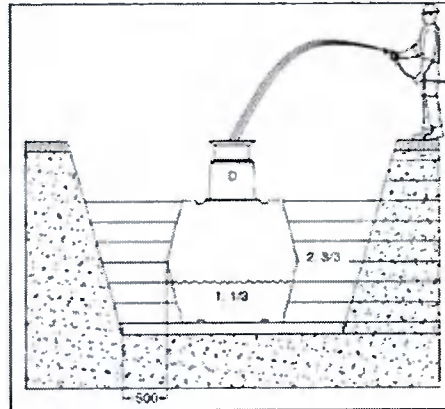
# Graf Site Specific Wastewater Treatment Recommendation

## 4 Tank installation

### Insertion and filling

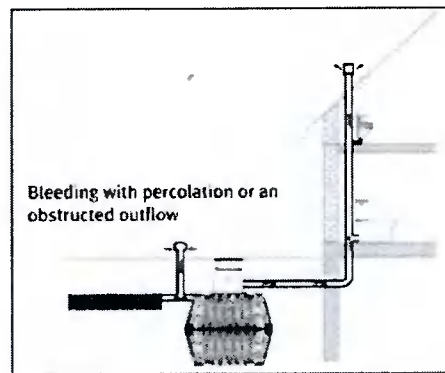
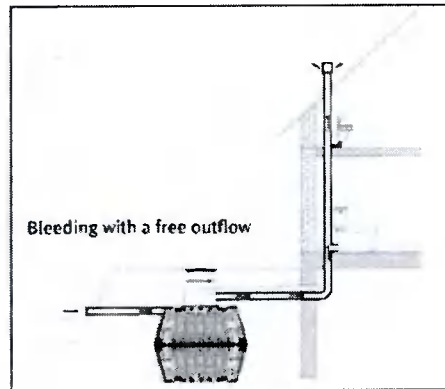
The tanks must be inserted, impact-free, into the prepared trench using suitable equipment. The tank is filled with 1/3 water before starting to backfill.

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.



4. Tank installation

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## 4 Tank installation

### 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

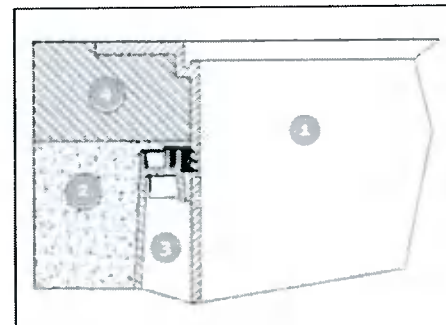
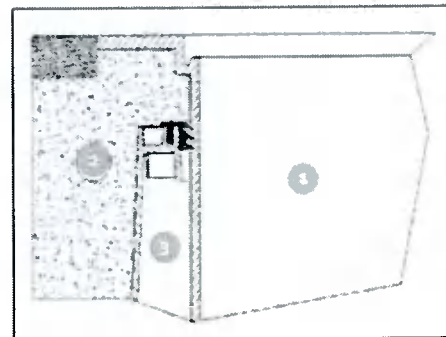
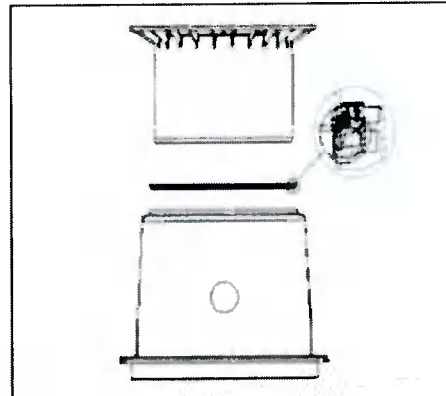
**Important:** To prevent loads from being transferred onto the tank, round-grain gravel (max. grain size 10 to 20mm) is filled in layers around the telescope and is evenly compacted.

Damage to the tank dome 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 (colour anthracite) must be supported with concrete (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).





Graf Site Specific Wastewater Treatment  
Recommendation

## SERVICE AGREEMENT

BETWEEN:

GRAF Ireland, Milltown Business Park, Milltown, Co Galway

-and-

System Type:

Original Commission Date:

Warranty Expiration:

Service Agreement Date:

**Graf Ireland**

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## Graf Site Specific Wastewater Treatment Recommendation

GRAF Ireland herein referred to as "The Contractor" is in the business of providing equipment maintenance services, and hereby undertakes to provide the following maintenance services to ..... herein referred to as "The Client":

1. All of the Equipment listed shall be inspected, maintained and repaired as necessary on an annual basis, for a minimum maintenance term of 5 years, as set out in our maintenance proposal.
2. "The Contractor" shall ensure that all services provided under the terms of this contract are performed by persons trained and proficient in the provision of the services provided.
3. "The Contractor" has the right to charge for any products or parts that are required outside of the guarantee period.
4. "The Contractor" is to provide a maintenance log for the system which will be kept and updated after every annual inspection.
5. Within the 5 year annual maintenance agreement "The Contract Term", "The Homeowner" will empty the Wastewater Treatment tank, "the Contractor" will advise after inspection when this may need to be completed.

In consideration of services provided by "The Contractor", "The Client" agrees as follows:

1. To pay to "The Contractor" the sum of **€225.00** (€255.00 including VAT) on an annual basis for the duration of this contract, to be received by no later than 28<sup>th</sup> February each year. Future payments to be made in accordance with the below schedule:

February 2022	€225.00 + VAT
February 2023	€225.00 + VAT
February 2024	€225.00 + VAT
February 2025	€225.00 + VAT
February 2026	€225.00 + VAT

This contract shall expire at the end of 2023 at which time the parties may extend it by agreement in writing. Either party may terminate this contract at any time by providing written notice of intent to terminate the contract on a specified date to the other party, at least two weeks prior to the intended date of termination.

Signed: \_\_\_\_\_

For and on behalf of Graf Ireland

Dated: \_\_\_\_\_

Signed: \_\_\_\_\_

For and on behalf of "The Client"

Dated: \_\_\_\_\_

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