SITE CHARACTERISATION FORM

This form has been completed in accordance with the Code of Practice:

WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

CLIENT: Galway County Council

LOCATION: Barrany, Annaghdown, Co. Galway

DATE: 02/02/2026

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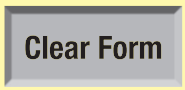
SITE CHARACTERISATION FORM
COMPLETING THE FORM

Note: This form requires the latest version of Adobe Acrobat Reader

and on PC's Windows 7 or later. Windows XP produces errors in calculations

Step 1:

Goto Menu Item **File, Save As** and save the file under a reference relating to the client or the planning application reference if available.



Use the **Clear Form** button to clear all information fields.

Notes:

All calculations in this form are automatic.

Where possible information is presented in the form of drop down selection lists to eliminate potential errors.

Variable elements are recorded by tick boxes. In all cases only one tick box should be activated.

All time record fields must be entered in twenty four hour format as follows: HH:MM

All date formats are DD-MM-YYYY.

All other data fields are in text entry format.

This form can be printed out fully populated for submission with related documents and for your files. It can also be submitted by email.

Section 3.2 In this section use an underline _____ across all six columns to indicate the depth at which changes in classification / characteristics occur.

Section 3.4 Lists supporting documentation required.

Section 4 Select the treatment systems suitable for this site and the discharge route.

Section 5 Indicate the system type that it is proposed to install.

Section 6 Provide details, as required, on the proposed treatment system.

APPENDIX A: SITE CHARACTERISATION FORM

File Reference:

1.0 GENERAL DETAILS (From planning application)

Prefix: First Name: Galway Surname: Co Council

Address:

Site Location and Townland: Barrany, Annaghdown, Co. Galway

Number of Bedrooms: 4 Maximum Number of Residents: 6

Comments on population equivalent

4 bedroom. Design population of 6 people as per table 3.2 in the Code of Practice 2021.

Proposed Water Supply:

Mains ✔ Private Well/Borehole ☐ Group Well/Borehole ☐

2.0 GENERAL DETAILS (From planning application)

Soil Type, (Specify Type): Till derived chiefly from limestone

Subsoil, (Specify Type): Grey Brown Podzolics, Brown Earths(medium-high base status)

Bedrock Type: pale grey clean skeletal limestone

Aquifer Category: Regionally Important Rk | Locally Important | Poor

Vulnerability: Extreme ☐ High ☐ Moderate ✔ Low ☐

Groundwater Body: Corrib Status Good

Name of Public/Group Scheme Water Supply within 1 km: Uisce Eireann

Source Protection Area: ZOC ☐ SI ☐ SO ☐ Groundwater Protection Response: R1

Presence of Significant Sites (Archaeological, Natural & Historical): None

Past experience in the area: None

Comments:

(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, and/or any potential site restrictions).

Potential Targets at Risk: Groundwater and Surface water will be at risk if minimum depths of suitable unsaturated permeable soil/subsoil above the water table or bedrock cannot be achieved.

The site is rated as having a Moderate vulnerability and a Regionally Important Aquifer and has a Groundwater Protection Response of R1, which indicates that the site may be acceptable for on-site effluent treatment subject to the min depth of free draining subsoil present and favorable T/P values.

Depth of free draining subsoil is critical.

Note: Only information available at the desk study stage should be used in this section.

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment

Landscape Position: Flat

Slope: Steep (>1:5) ☐ Shallow (1:5-1:20) ☐ Relatively Flat (<1:20) ✔

Slope Comment

Surface Features within a minimum of 250m (Distance To Features Should Be Noted In Metres)

Houses:

There are some houses with treatment systems within 250m showing no affects on the local groundwater.

Existing Land Use:

Agricultural farmland.

Vegetation Indicators:

Grassland

Groundwater Flow Direction: East to West

Ground Condition:

firm/soft in patches

Site Boundaries:

Hedgerow /stone walls and stock proof fencing

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Roads:

Local road to the South of the site

Outcrops (Bedrock And/Or Subsoil):

None within 500 meters

Surface Water Ponding:

None within 500 meters

Lakes:

None within 500 meters

Beaches/Shellfish Areas:

None within 500 meters

Wetlands:

Wetlands area located 170m to the North of the site

Karst Features:

None within 500 meters

Watercourses/Streams:*

LISÍN_AN_ÓRÁIN located 320m to the east of the site

***Note and record** water level

3.0 ON-SITE ASSESSMENT

3.1 Visual Assessment (contd.)

Drainage Ditches:*

Drainage ditch located 50m to the north of the site

Springs:*

None within 500 meters

Wells:*

None within 500 meters

Comments:
(Integrate the information above in order to comment on: the potential suitability of the site, potential targets at risk, the suitability of the site to treat the wastewater and the location of the proposed system within the site).

Potential targets at risk:
Ground/surface water at risk where insufficient depth of free draining soil/subsoil is not found.

Fast percolation rates <3 where found would indicate an increased risk to groundwater.
Slow percolation rates >75 would indicate an increased risk of surface water ponding.

From visual inspection the site may be suitable for the effective treatment of domestic wastewater providing a favourable T/P value is achievable and sufficient unsaturated free draining soil depth is available.

***Note and record** water level

3.2 Trial Hole (should be a minimum of 2.1m deep (3m for regionally important aquifers))

To avoid any accidental damage, a trial hole assessment or percolation tests should not be undertaken in areas which are at or adjacent to significant sites, (e.g. NHAs, SACs, SPAs, and/or Archaeological etc.), without prior advice from National Parks and Wildlife Service or the Heritage Service.

Depth of trial hole (m): 2.0

Depth from ground surface to bedrock (m) (if present):

Depth from ground surface to water table (m) (if present): 1.1

Depth of water ingress: 0.9 Rock type (if present):

Date and time of excavation: 23-Jan-2026 11:00 Date and time of examination: 26-Jan-2026 13:00

Depth of Surface and Subsurface Percolation Tests		Soil/Subsoil Texture & Classification**	Plasticity and dilatancy***	Soil Structure	Density/ Compactness	Colour****	Preferential flowpaths
0.1 m		Clay		Crumb	firm	Dark Brown	Rootlets
0.2 m							
0.3 m		---	---	---	---	---	---
0.4 m							
0.5 m							
0.6 m							
0.7 m		Silty clay with some gravels	Threads = 6 Avg Ribbons = 140 Dilatant = difficulty	Massive	Compact	Ligh brown/Grey	None
0.8 m							
0.9 m							
1.0 m							
1.1 m	WT	WATER TABLE					
1.2 m		---	---	---	---	---	---
1.3 m							
1.4 m							
1.5 m							
1.6 m							
1.7 m							
1.8 m							
1.9 m							
2.0 m							
2.1 m							
2.2 m							
2.3 m							
2.4 m							
2.5 m							
2.6 m							
2.7 m							
2.8 m							
2.9 m							
3.0 m							
3.1 m							
3.2 m							
3.3 m							
3.4 m							
3.5 m							

Likely Subsurface Percolation Value: 30

Likely Surface Percolation Value: 30

Note: *Depth of percolation test holes should be indicated on log above. ('Enter Surface or Subsurface at depths as appropriate).

** See Appendix E for BS 5930 classification.

*** 3 samples to be tested for each horizon and results should be entered above for each horizon.

**** All signs of mottling should be recorded.

3.2 Trial Hole (contd.) Evaluation:

3.3(a) Subsurface Percolation Test for Subsoil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm) (A)	400	400	400
Depth from ground surface to base of hole (mm) (B)	800	800	800
Depth of hole (mm) [B - A]	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

Pre-soak start	Date	25-Jan-2026	25-Jan-2026	25-Jan-2026
	Time	10:00	10:00	10:00
2nd pre-soak start	Date	25-Jan-2026	25-Jan-2026	25-Jan-2026
	Time	14:00	14:00	14:00

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	26-01-2026	26-01-2026	26-01-2026
Time filled to 400 mm	09:30	09:30	09:30
Time water level at 300 mm	10:43	10:36	10:56
Time (min.) to drop 100 mm (T_{100})	73.00	66.00	86.00
Average T_{100}			75.00

If T_{100} > 480 minutes then Subsurface Percolation value >120 – site unsuitable for discharge to ground
If $T_{100} \leq$ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	Δt (min)
1	10:43	11:59	76.00	10:36	11:48	72.00	10:56	12:23	87.00
2	12:00	13:20	80.00	11:49	13:11	82.00	12:24	13:54	90.00
3	13:21	14:45	84.00	13:12	15:06	114.00	13:55	15:28	93.00
Average Δt Value			80.00			89.33			90.00
	Average Δt/4 = [Hole No.1]		20.00 (t_1)	Average Δt/4 = [Hole No.2]		22.33 (t_2)	Average Δt/4 = [Hole No.3]		22.50 (t_3)

Result of Test: Subsurface Percolation Value = 21.61 (min/25 mm)

Comments:

T Test passed

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Tim§e hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_2)			0.00

Result of Test: Subsurface Percolation Value =

0.00 (min/25 mm)

Comments:

3.3(b) Surface Percolation Test for Soil

Step 1: Test Hole Preparation

Percolation Test Hole	1	2	3
Depth from ground surface to top of hole (mm)	0	0	0
Depth from ground surface to base of hole (mm)	400	400	400
Depth of hole (mm)	400	400	400
Dimensions of hole [length x breadth (mm)]	300 x 300	300 x 300	300 x 300

Step 2: Pre-Soaking Test Holes

		1	2	3
Pre-soak start	Date	25-Jan-2026	25-Jan-2026	25-Jan-2026
	Time	10:00	10:00	10:00
2nd pre-soak start	Date	25-Jan-2026	25-Jan-2026	25-Jan-2026
	Time	14:00	14:00	14:00

Each hole should be pre-soaked twice before the test is carried out.

Step 3: Measuring T_{100}

Percolation Test Hole No.	1	2	3
Date of test	26-Jan-26	26-Jan-26	26-Jan-2026
Time filled to 400 mm	09:30	09:30	09:30
Time water level at 300 mm	11:06	11:18	11:04
Time to drop 100 mm (T_{100})	96.00	108.00	94.00
Average T_{100}			99.33

If T_{100} > 480 minutes then Surface Percolation value >90 – site unsuitable for discharge to ground
If $T_{100} \leq$ 210 minutes then go to Step 4;
If T_{100} > 210 minutes then go to Step 5;

Step 4: Standard Method (where $T_{100} \leq 210$ minutes)

Percolation Test Hole	1			2			3		
Fill no.	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)	Start Time (at 300 mm)	Finish Time (at 200 mm)	ΔT (min)
1	11:06	12:45	99.00	11:18	12:57	99.00	11:04	12:36	92.00
2	12:45	14:30	105.00	12:58	14:39	101.00	12:37	14:14	97.00
3	14:31	16:24	113.00	14:40	16:39	119.00	14:15	16:04	109.00
Average ΔT Value			105.67			106.33			99.33
	Average ΔT/4 = [Hole No.1]		26.42 (T_1)	Average ΔT/4 = [Hole No.2]		26.58 (T_2)	Average ΔT/4 = [Hole No.3]		24.83 (T_3)

Result of Test: Surface Percolation Value = 25.94 (min/25 mm)

Comments:

P test passed

Step 5: Modified Method (where $T_{100} > 210$ minutes)

Percolation Test Hole No. 1

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 1 = (T_1)			0.00

Percolation Test Hole No. 2

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 2 = (T_2)			0.00

Result of Test: Surface Percolation Value =

0.00 (min/25 mm)

Percolation Test Hole No. 3

Fall of water in hole (mm)	Time Factor = T_f	Start Time hh:mm	Finish Time hh:mm	Time of fall (mins) = T_m	$K_{fs} = T_f / T_m$	T – Value = 4.45 / K_{fs}
300 - 250	8.1			0.00		
250 - 200	9.7			0.00		
200 - 150	11.9			0.00		
150 - 100	14.1			0.00		
Average	T- Value		T- Value Hole 3 = (T_2)			0.00

Comments:

3.4 The following associated Maps, Drawings and Photographs should be appended to this site characterisation form.

1. Discovery Series 1:50,000 Map indicating overall drainage, groundwater flow direction and housing density in the area.
2. Supporting maps for vulnerability, aquifer classification, soil, subsoil, bedrock.
3. North point should always be included.
4. (a) Scaled sketch of site showing measurements to Trial Hole location and
   (b) Percolation Test Hole locations,
   (c) wells and
   (d) direction of groundwater flow (if known),
   (e) proposed house (incl. distances from boundaries)
   (f) adjacent houses,
   (g) watercourses,
   (h) significant sites
   (i) and other relevant features.
5. Site specific cross sectional drawing of the site and the proposed layout[1] should be submitted.
6. Photographs of the trial hole, test holes and site including landmarks (date and time referenced).
7. Pumped design must be designed by a suitably qualified person.

[1] The calculated percolation area or polishing filter area should be set out accurately on the site layout drawing in accordance with the code of practice's requirements.

4.0 CONCLUSION of SITE CHARACTERISATION

Integrate the information from the desk study and on-site assessment (i.e. visual assessment, trial hole and percolation tests) above and conclude the type of system(s) that is (are) appropriate. This information is also used to choose the optimum final disposal route of the treated wastewater.

Slope of proposed infiltration / treatment area: 1:200

Are all minimum separation distances met? ✔

Depth of unsaturated soil and/or subsoil beneath invert of gravel (or drip tubing in the case of drip dispersal system) 1.10

Percolation test result: Surface: 25.94 Sub-surface: 21.61

Not Suitable for Development ☐ **Suitable for Development** ✔

Identify all suitable options

1. Septic tank system (septic tank and percolation area) **(Chapter 7)** — No
2. Secondary Treatment System **(Chapters 8 and 9)** and soil polishing filter **(Section 10.1)** — Yes
3. Tertiary Treatment System and Infiltration / treatment area **(Section 10.2)** — Yes

Discharge Route [1]

Discharge to Ground Water

5.0 SELECTED DWWTS

Propose to install: Secondary Treatment System and soil polishing filter

and discharge to: Ground Water

Invert level of the trench/bed gravel or drip tubing (m)

Site Specific Conditions (e.g. special works, site improvement works testing etc.

.SECONDARY TREATMENT SYSTEM:-
Due to the high water table Its recommended that the effluent be treated by a packaged treatment unit and then pumped to a soil polishing filter consisting of 90sqm of 250mm deep pea gravel 12-32mm and there after into 0.9m of unsaturated free draining soil.
There shall to be a minimum thickness of 0.9m of unsaturated soil between the point of infiltration of the effluent and bedrock/water table.

Soil Polishing Filter: 90sqm as per table 10.1 of the code of practice.

Excavate a perimeter french drain (min 2m from area) around the percolation area c600mm x 600mm deep to intercept water entering the proposed percolation area.

Seperation distances must be adhered to as per table 6.1 EPA of the code of practice.

[1] A discharge of sewage effluent to "waters" (definition includes any or any part of any river, stream, lake, canal, reservoir, aquifer, pond, watercourse or other inland waters, whether natural or artificial) will require a licence under the Water Pollution Acts 1977-90. Refer to Section 2.4.

6.0 TREATMENT SYSTEM DETAILS

SYSTEM TYPE: Septic Tank Systems (Chapter 7)

Tank Capacity (m^3)

Percolation Area		Mounded Percolation Area	
No. of Trenches		No. of Trenches	
Length of Trenches (m)		Length of Trenches (m)	
Invert Level (m)		Invert Level (m)	

SYSTEM TYPE: Secondary Treatment System (Chapters 8 and 9) and polishing filter (Section 10.1)

Secondary Treatment Systems receiving septic tank effluent (Chapter 8)

Media Type	Area (m^2)*	Depth of Filter	Invert Level
Sand/Soil			
Soil			
Constructed Wetland			
Other			

Packaged Secondary Treatment Systems receiving raw wastewater (Chapter 9)

Type: Graf One 2 Clean

Capacity PE: 7

Sizing of Primary Compartment: 4.00 m^3

Polishing Filter*: (Section 10.1)

Surface Area (m^2)*: 90.00

Option 1 - Direct Discharge Surface area (m^2)

Option 2 - Pumped Discharge Surface area (m^2): 90.00

Option 3 - Gravity Discharge Trench length (m)

Option 4 - Low Pressure Pipe Distribution Trench length (m)

Option 5 - Drip Dispersal Surface area (m^2)

SYSTEM TYPE: Tertiary Treatment System and infiltration / treatment area (Section 10.2)

Identify purpose of tertiary treatment	Provide performance information demonstrating system will provide required treatment levels	Provide design information

DISCHARGE ROUTE:

Groundwater ✔ Hydraulic Loading Rate * ($l/m^2.d$) Surface area (m^2)

Surface Water ** Discharge Rate (m^3/hr)

* Hydraulic loading rate is determined by the percolation rate of subsoil

** Water Pollution Act discharge licence required

6.0 TREATMENT SYSTEM DETAILS

QUALITY ASSURANCE:

Installation & Commissioning

THE TREATMENT UNIT SHALL BE INSTALLED IN ACCORDANCE THE REQUIREMENTS OUTLINED IN THE EPA CODE OF PRACTICE - WASTEWATER TREATMENT AND DISPOSAL SYSTEMS SERVING SINGLE HOUSES 2021. COMMISSIONING BY MANUFACTURES REPERSENTIVE.

On-going Maintenance

DE-SLUDGING SHALL BE CARRIED OUT A MINIMUM OF ONCE PER YEAR AND IN ACCORDANCE THE REQUIREMENTS OUTLINED IN TABLE 12.2 IN THE EPA CODE OF PRACTICE - WASTEWATER TREATMENT AND DISPOSAL SYSTEMS SERVING SINGLE HOUSES 2021.

7.0 SITE ASSESSOR DETAILS

Company:

Prefix: Mr First Name: Paul Surname: Roche

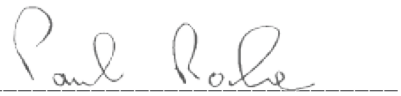
Address: Ardcarne,
Boyle,
Co. Roscommon

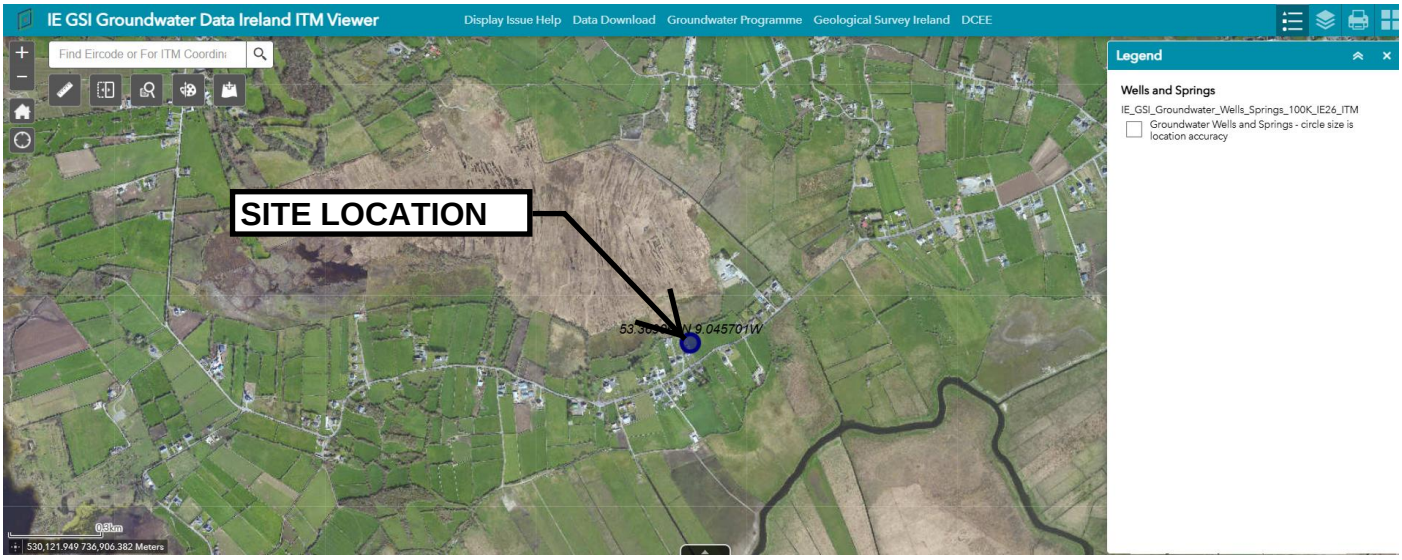
Qualifications/Experience: B Eng (Honours) and Certificate in Site Suitability on site wastewater Treatment

Date of Report: 02-Feb-2026

Phone: 0863018137 E-mail prengconsultants@gmail.com

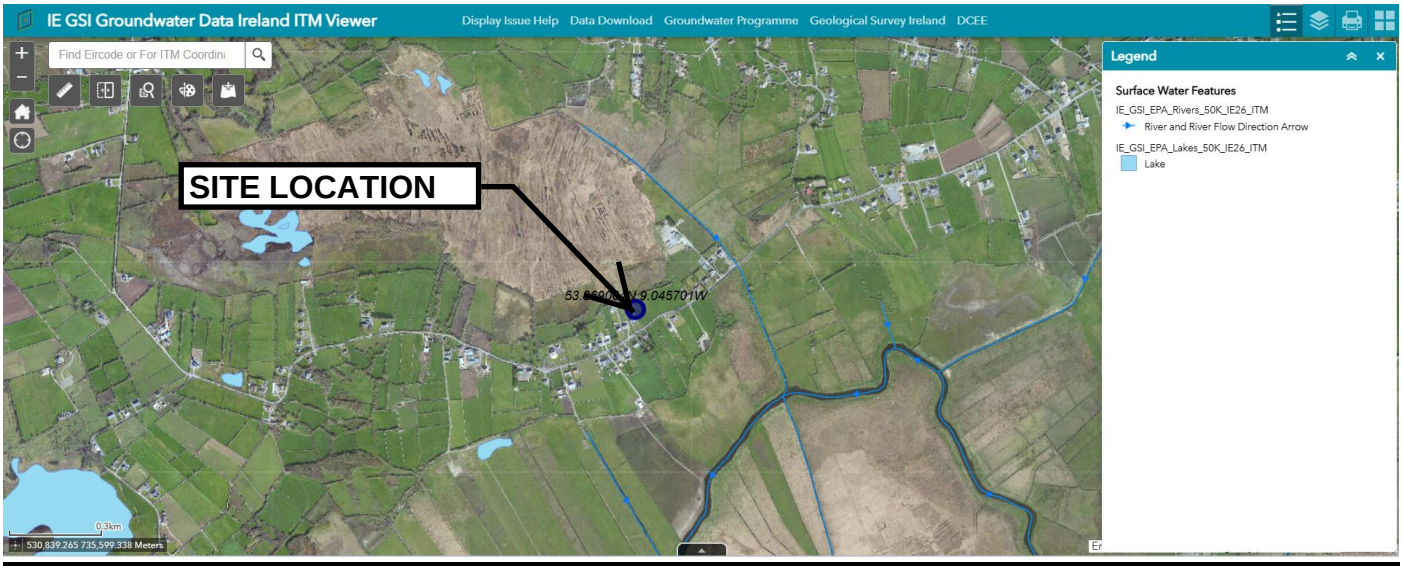
Indemnity Insurance Number:

Signature: 

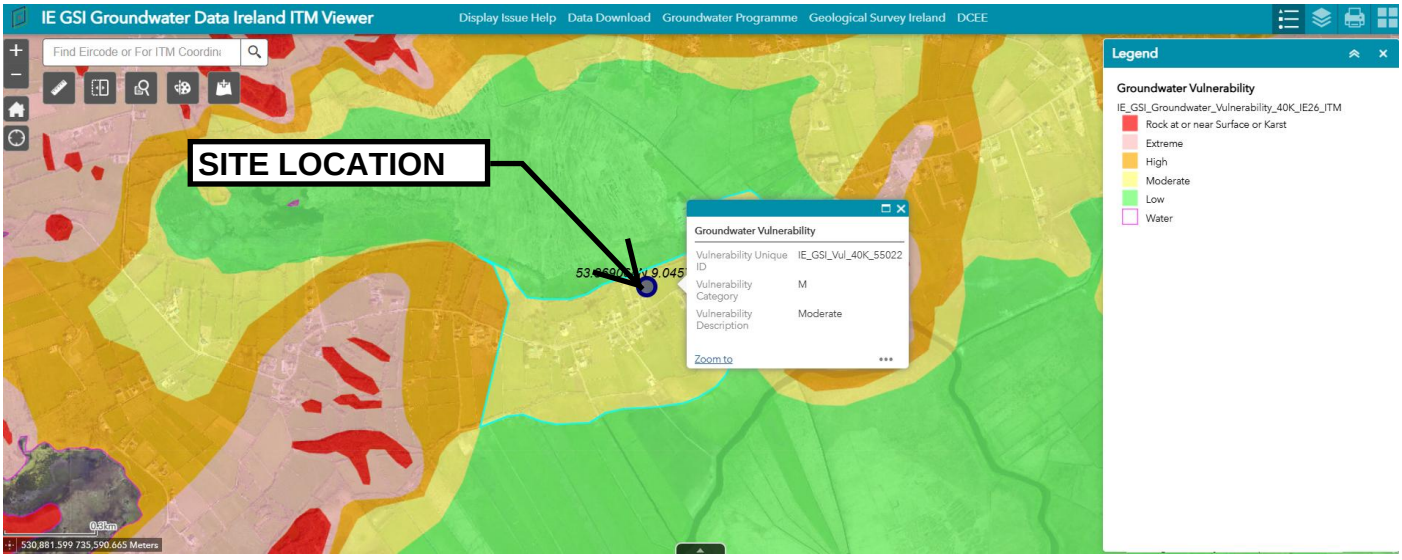


WELLS MAP

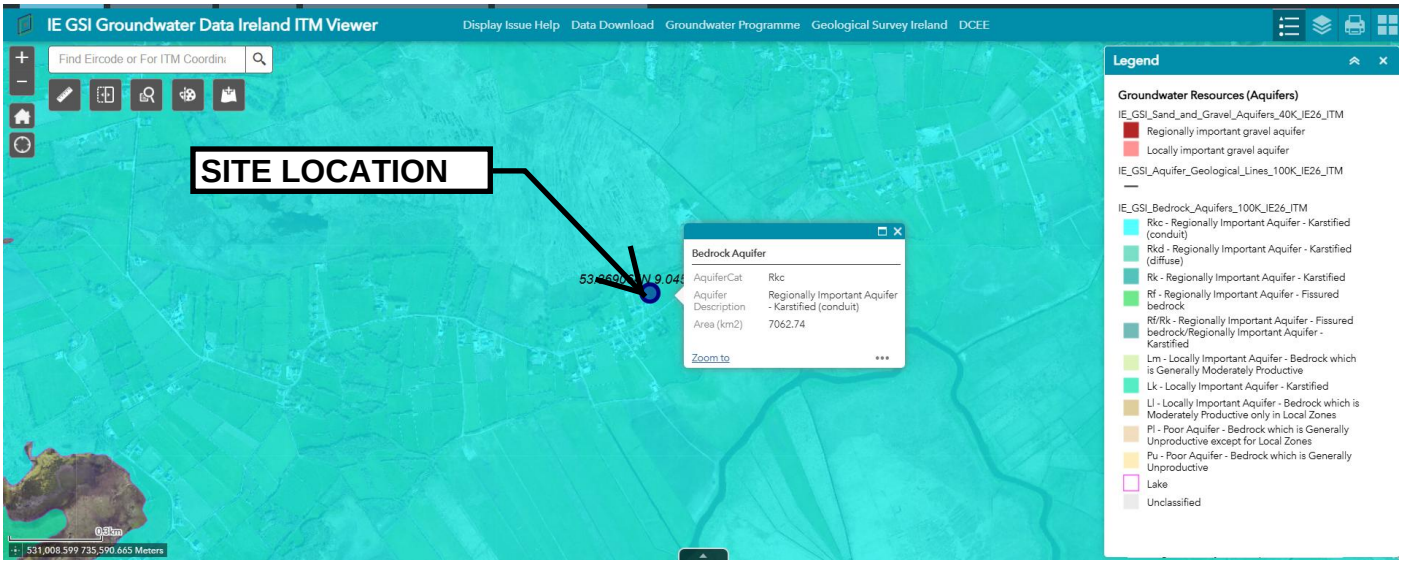
KARST MAP



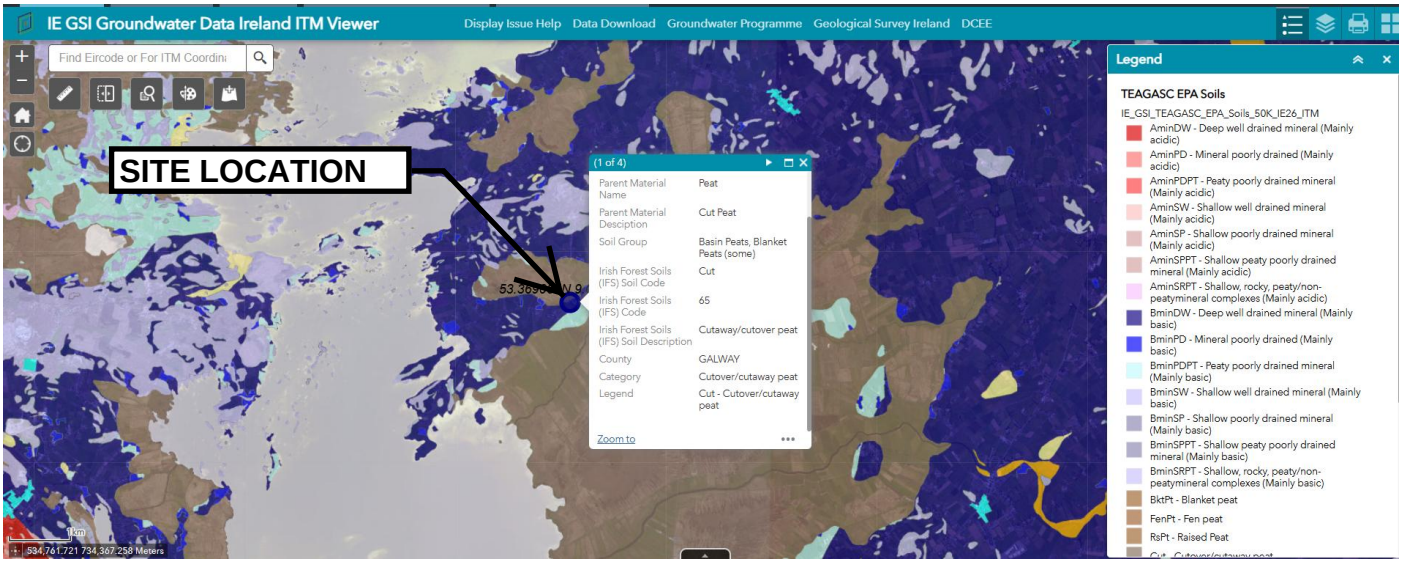
RIVERS AND LAKES MAP



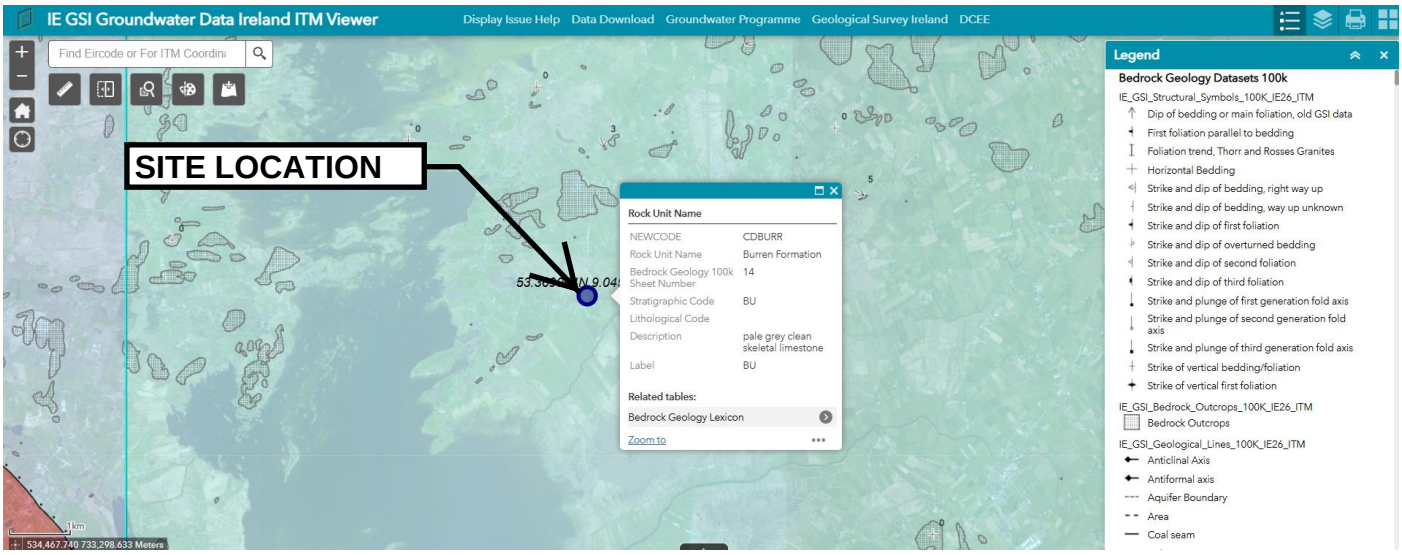
VULNERABILITY MAP



AQUIFER MAP

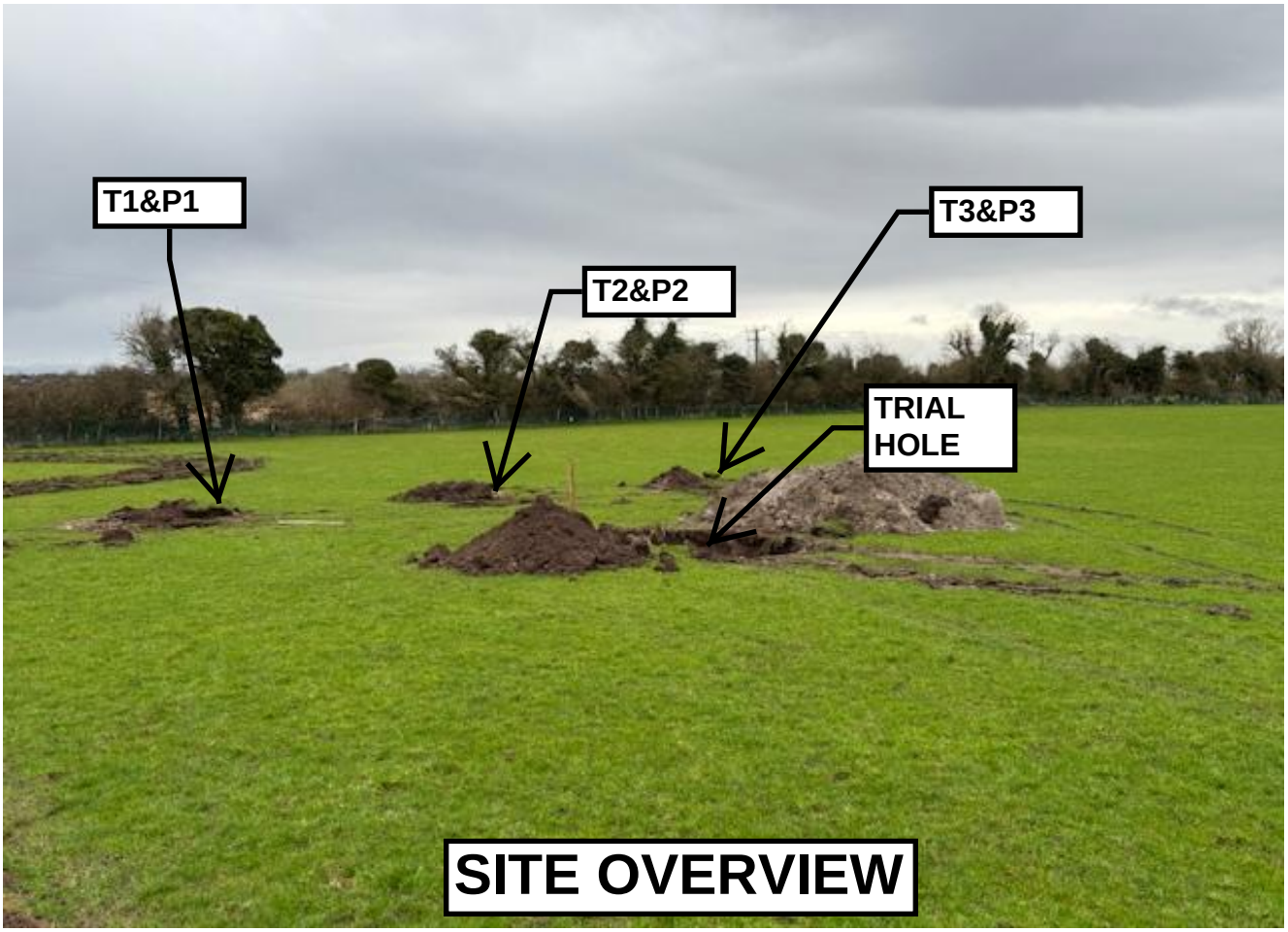


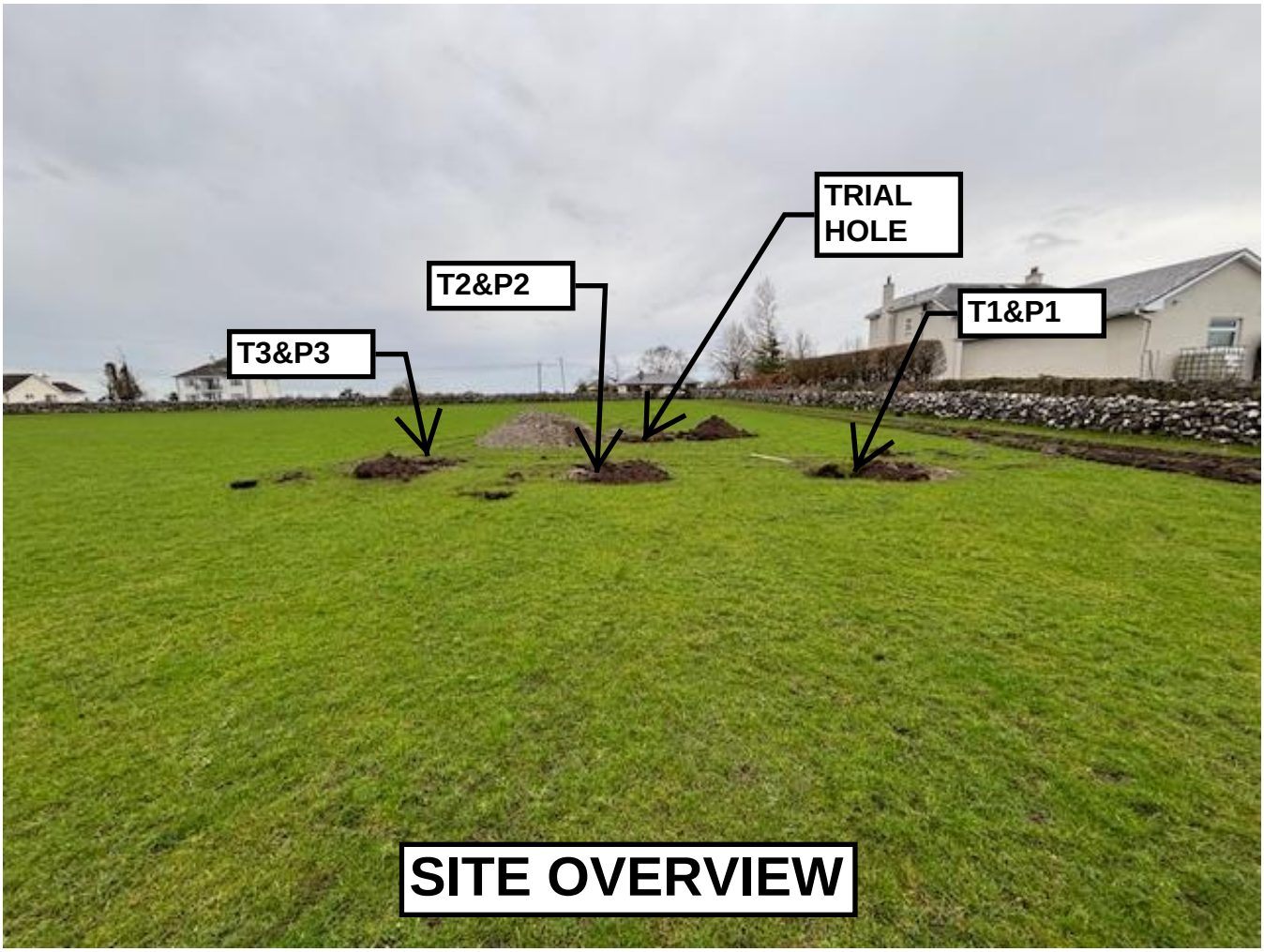
SOILS MAP



BEDROCK MAP

GROUNDWATER FLOW DIRECTION


T1&P1
T2&P2
T3&P3
TRIAL HOLE
SITE OVERVIEW


TRIAL HOLE
T2&P2
T1&P1
T3&P3
SITE OVERVIEW


T1


P1


T2


P2


T3


P3


TRIAL HOLE

Graf Site Specific Wastewater Treatment Recommendation

Client: Galway County Council
Site Address: Barrany, Annaghdown, Co. Galway
Population Equivalent: 6PE
Sub surface Test Value: **21.61**
Surface Test Value: 25.94
Proposed Solution: One 2 Clean 7PE Wastewater treatment system with external Pumped discharge followed by a Soil Polishing Filter over 90m2 Gravel bed .

Graf Ireland
Milltown Business Park | Milltown | Co Galway | 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.

The polishing filter must have a minimum thickness of 0.9m of free draining unsaturated soil between the point of infiltration of the effluent and the water table or bedrock. The Polishing filter must be constructed in accordance with section 10.1, EPA CoP 2021 and under the supervision of a suitably qualified person.

Its recommended that the effluent be treated by a packaged treatment unit and then pumped to a soil polishing filter consisting of 90sqm of 250mm deep pea gravel 12-32mm and thereafter into 0.9m of unsaturated free draining soil.
There shall to be a minimum thickness of 0.9m of unsaturated soil between the point of infiltration of the effluent and bedrock/water table.

Soil Polishing Filter: 90sqm as per table 10.1 of the code of practice.

All works must be supervised and certified by a suitably qualified Civil Engineer or similar qualified person approved by the Local Authority.Confirmation from the effluent treatment system suppliers that the system has been installed and is functioning correctly, should be obtained by the client. The client must enter a maintenance contract and the system should be serviced periodically. The tank should be de-sludged periodically by a licensed contractor.

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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 500 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^2)	Trench length required per person (m)	Trench length required per person (m)	Area required per person (m^2)	Area required per person (m^2)
3 ≤ PV ≤ 20	≥7.5	≥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	–

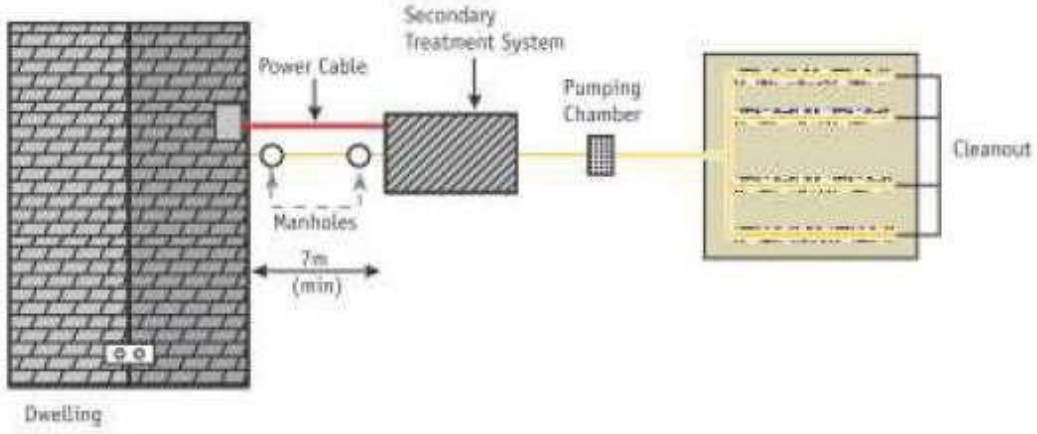
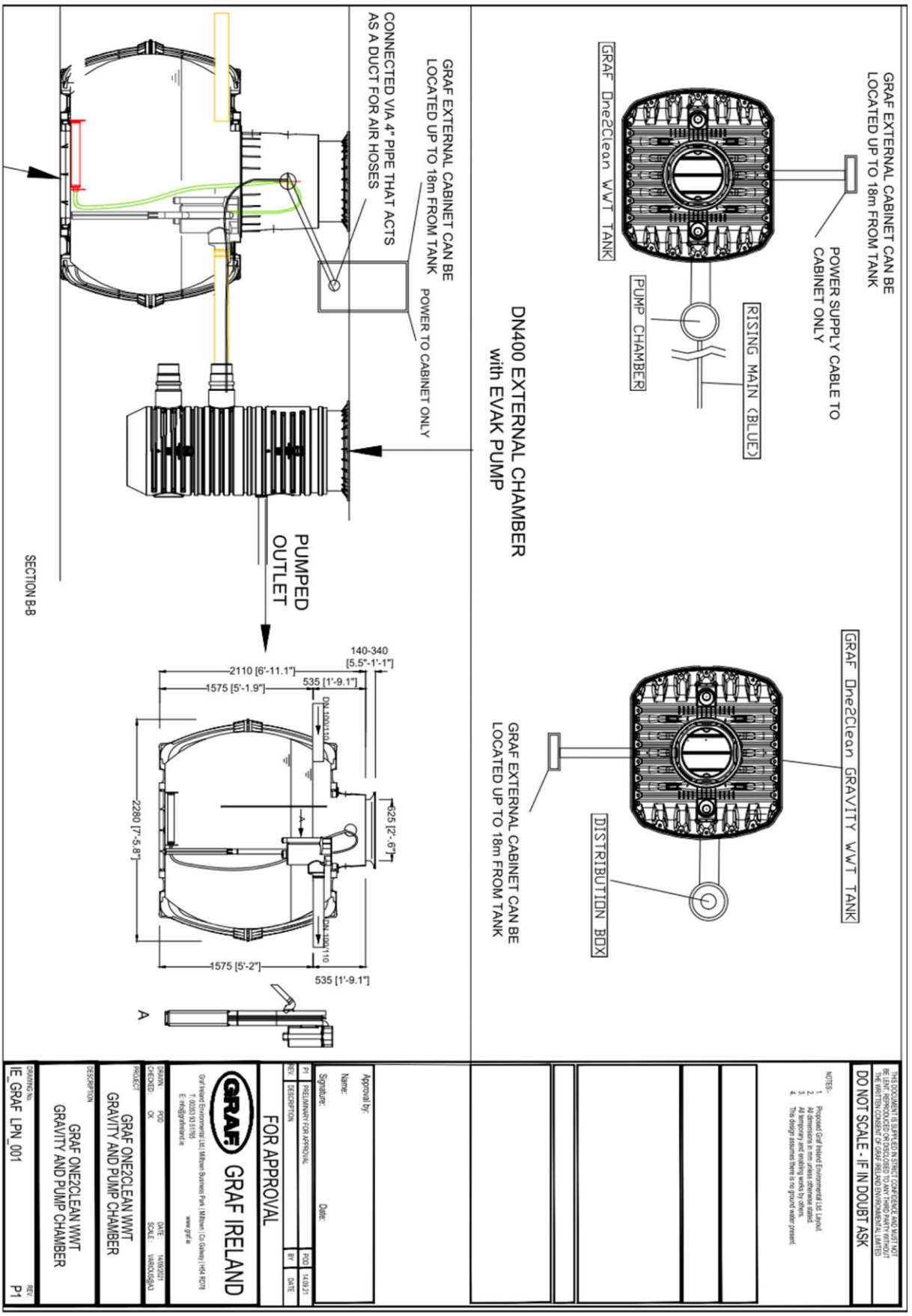


Figure 10.1: Example of a typical low-pressure pipe distribution system

Graf Site Specific Wastewater Treatment Recommendation



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Prüfinstitut für Abwassertechnik GmbH

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	0.75 m³/d		
Material	Polypropylene		
Watertightness	Pass		
Structural behaviour (Pit Test)	Pass (also wet conditions)		
Durability	Pass		
Treatment efficiency (nominal sequences)		Efficiency	Effluent
	COD	94.2 %	43 mg/l
	BOD_5	98.0 %	7 mg/l
	NH_4-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.

Notified Body No.: 1739

Certified according to ISO 9001:2008

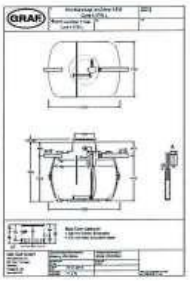
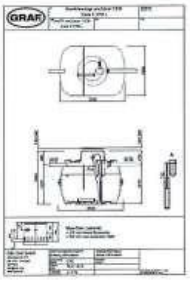
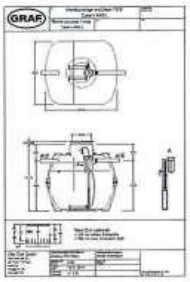
DAkkS Deutsche Akkreditierungsstelle D-PL-17712-01-00

Prüfinstitut für Abwassertechnik GmbH
geprüft - tested - testé

Elmar Lancé July 2016

Page 1 of 12

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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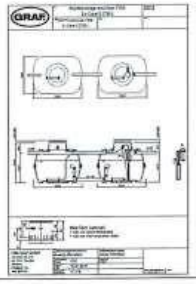
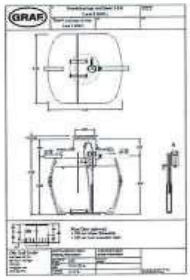
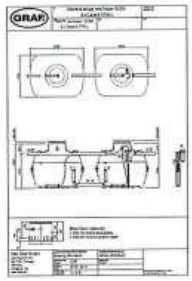
Population Equation (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
7		Pass PIA2008-WD-AT0805-1027b	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, 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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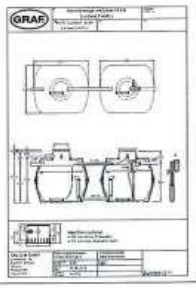
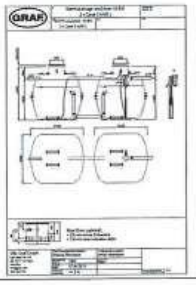
Population Equation (PE)	Drawing of model of the range	Watertightness (EN 12566-3 Annex A)	Treatment Efficiency (EN 12566-3 Annex B)	Structural Behaviour (EN 12566-3 Annex C)	Durability
14		Pass PIA2008-WD-AT0805-1027b	Pass Range conformity according to S.R. 66:2015	Pass For wet ground conditions also, Installation depth 1.65 m from inlet invert	Pass SKZ 114836/15
18		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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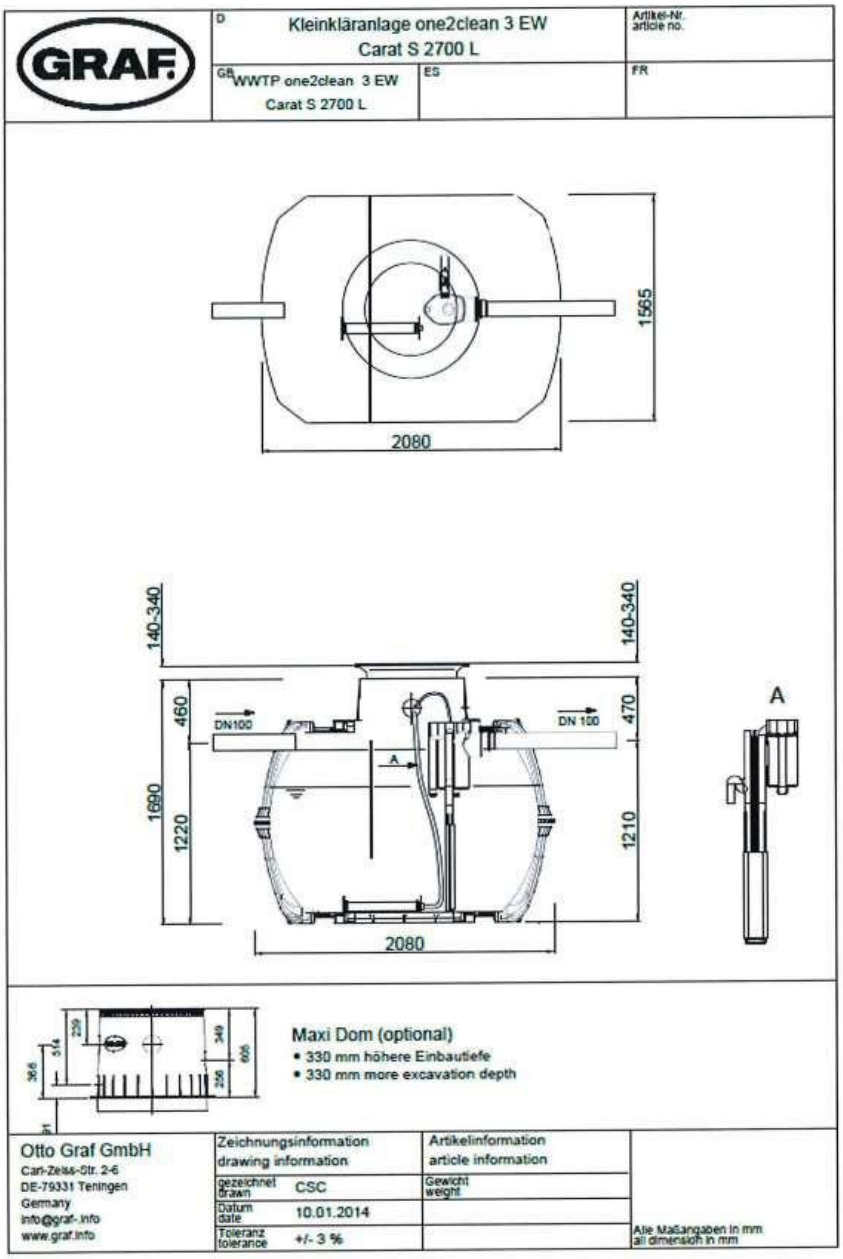

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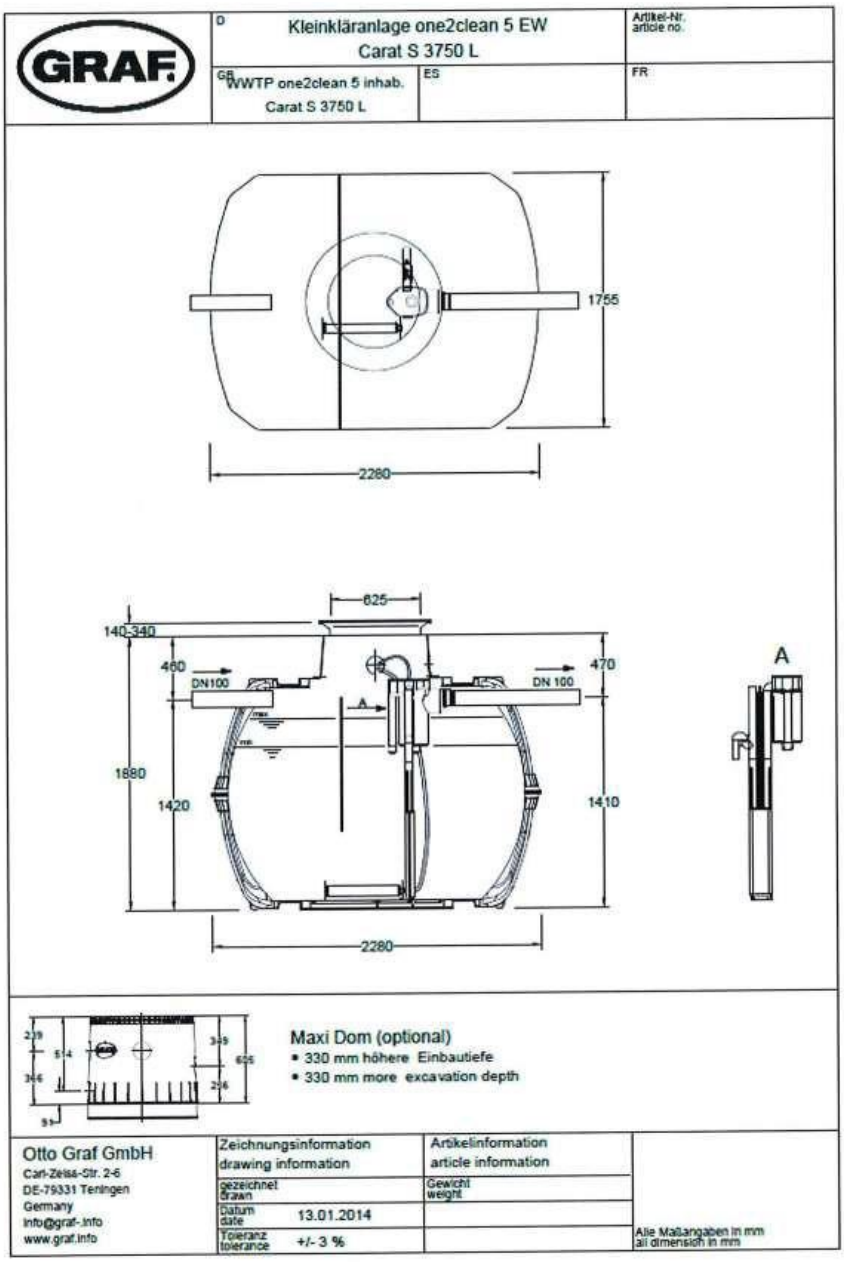

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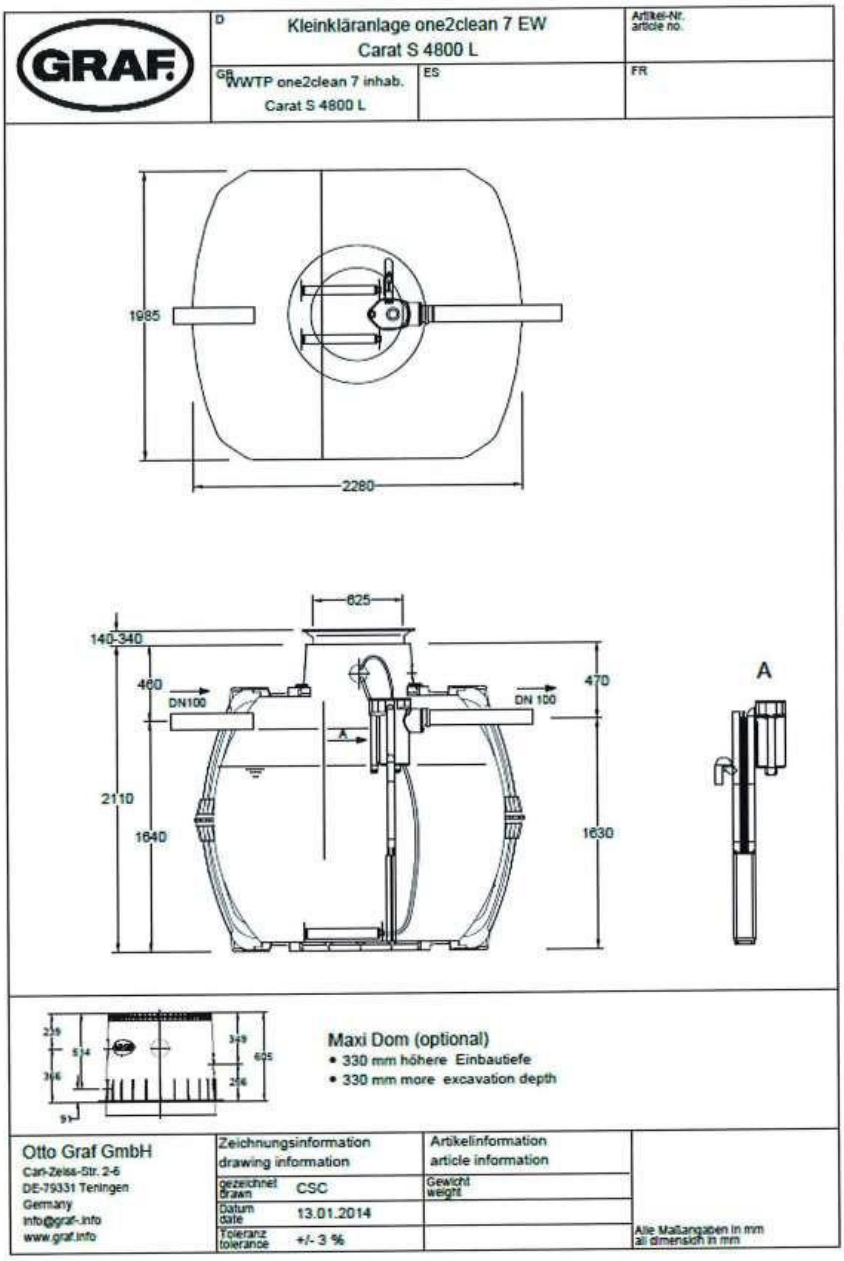

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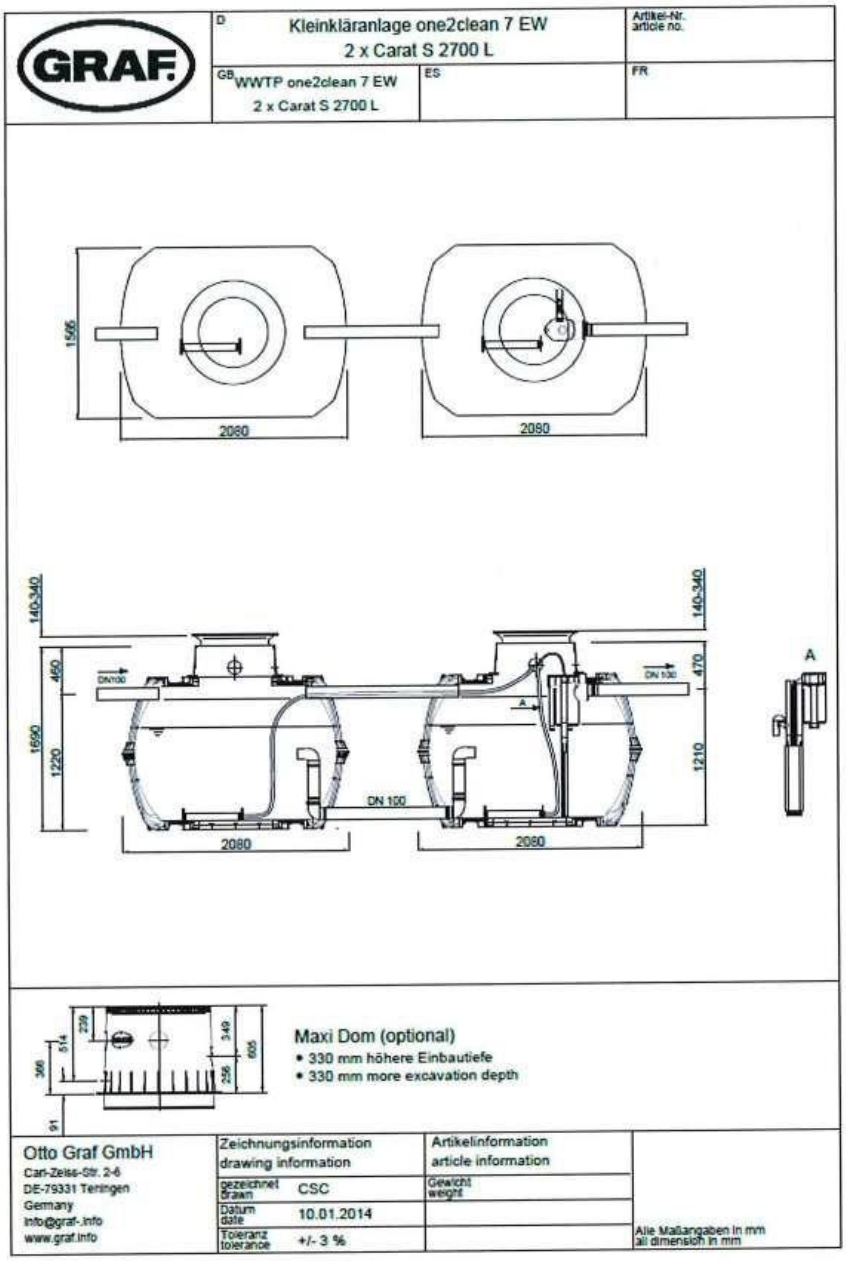

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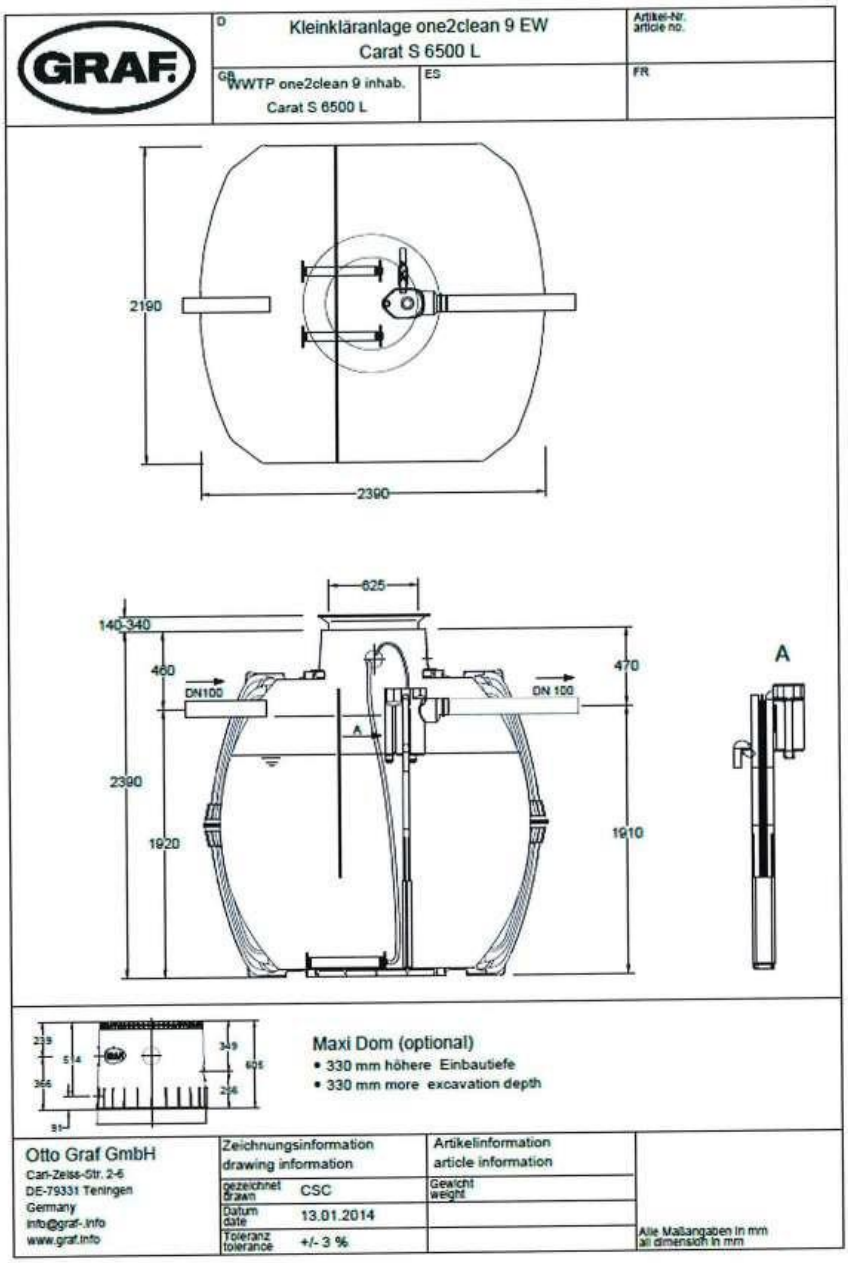

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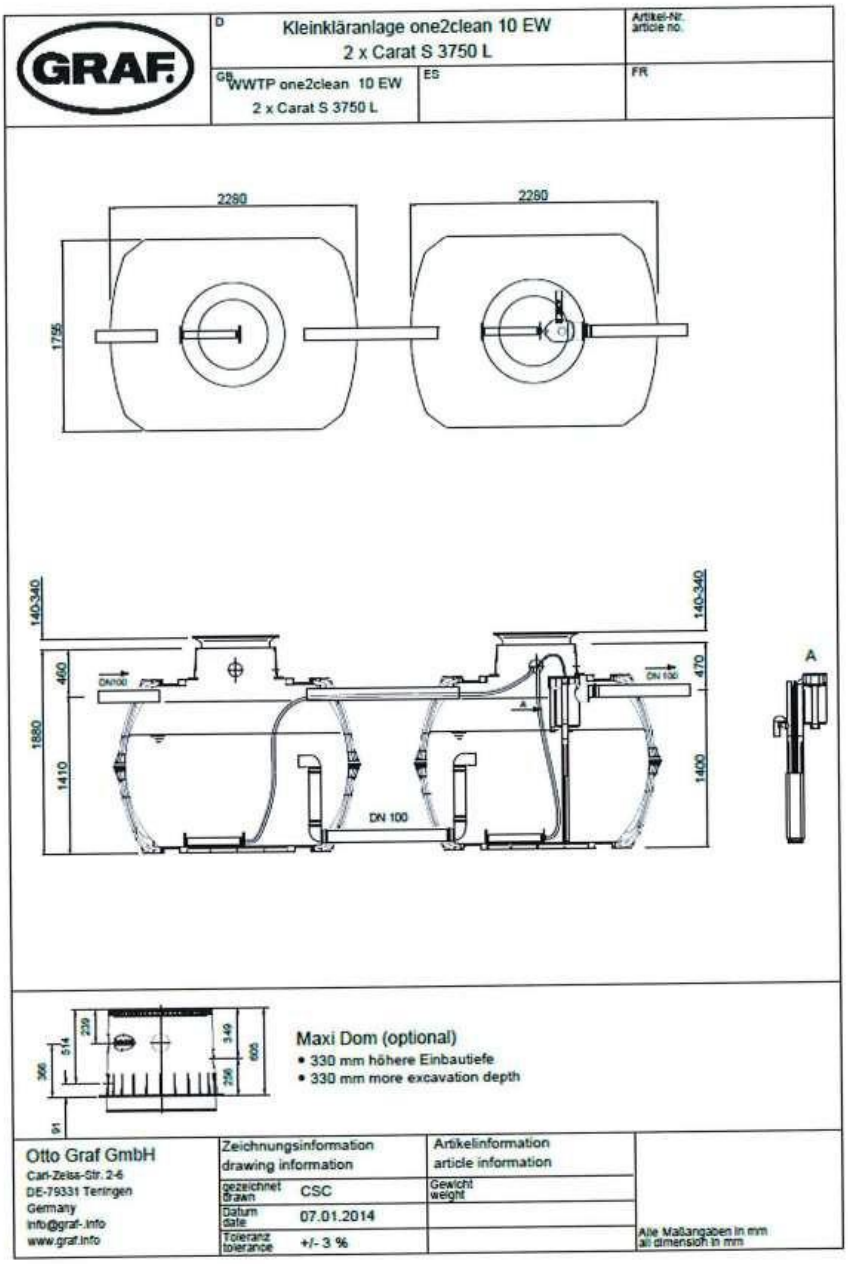

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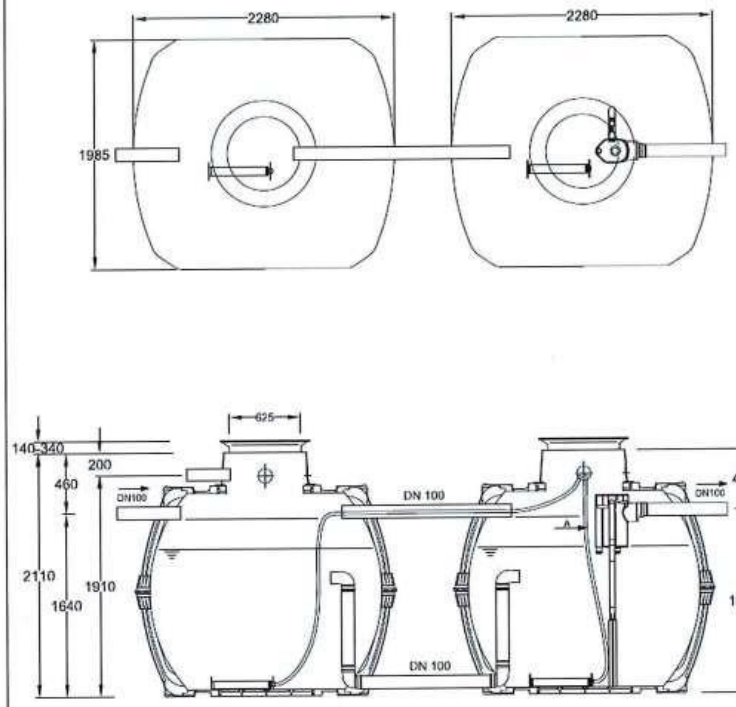
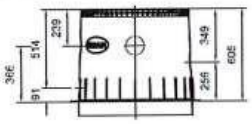
GRAF	D Kleinkläranlage one2clean 14 EW 2 x Carat S 4800 L	Artikel-Nr. article no.
	GB WWTP one2clean 14 EW 2 x Carat S 4800 L	ES / FR





Maxi Dom (optional)
- 330 mm höhere Einbautiefe
- 330 mm more excavation depth

Otto Graf GmbH Carl-Zeiss-Str. 2-6 DE-79331 Teningen Germany info@graf-info www.graf.info	Zeichnungsinformation drawing information	Artikelinformation article information	
	gezeichnet / drawn: CSC	Gewicht / weight:	
	Datum / date: 06.06.2013		
	Toleranz / tolerance: +/- 3 %		Alle Maßangaben in mm all dimension in mm

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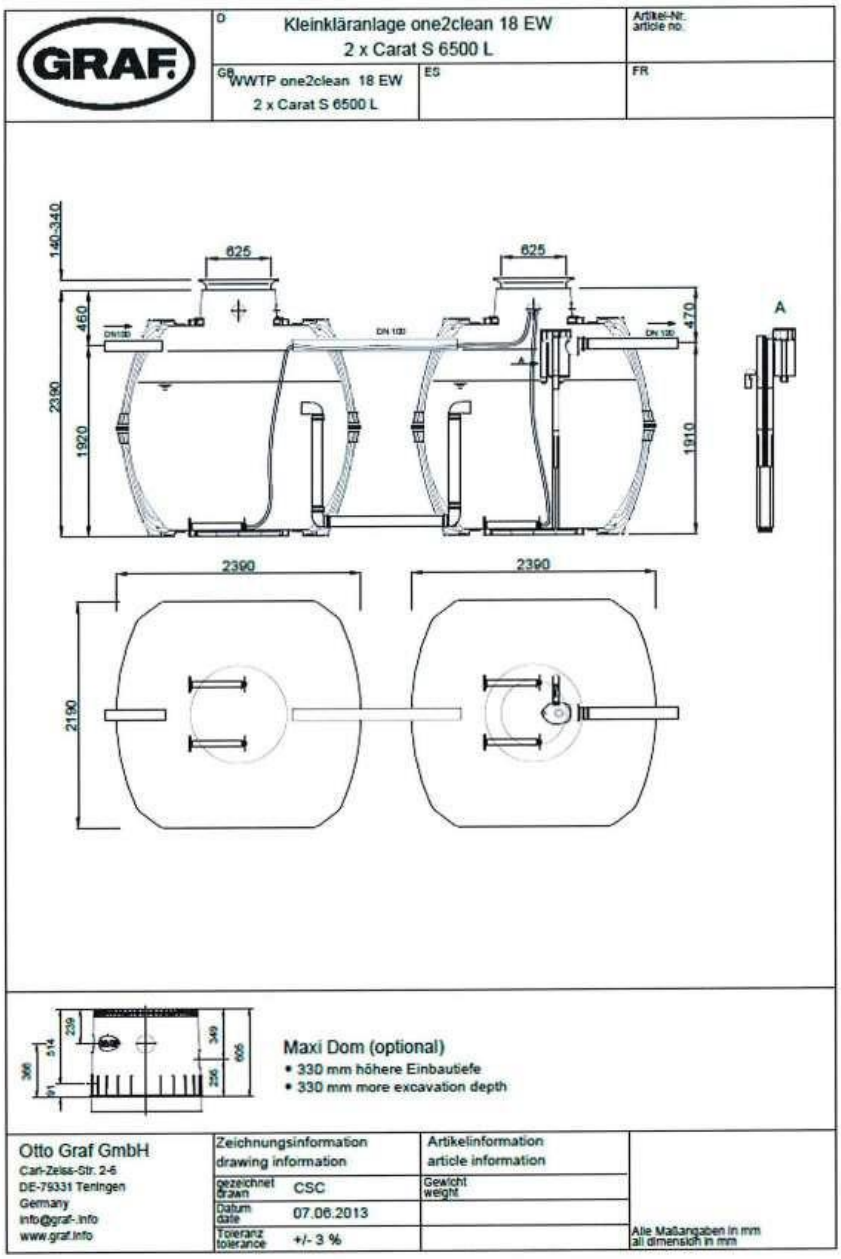

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Graf Site Specific Wastewater Treatment Recommendation

IMPORTANT READ ME

Installation manual for Carat underground tank

ONE2CLEAN TANKS

Document No. Graf-0003 Rev. 1

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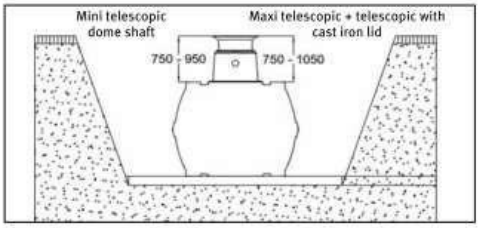
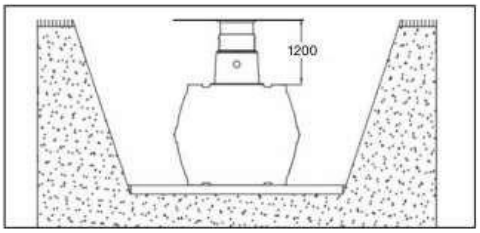
2 Installation conditions

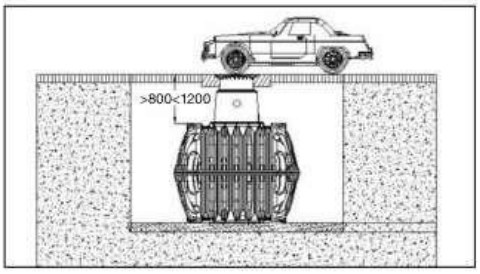
Coverage heights with telescopic dome shaft in green areas.



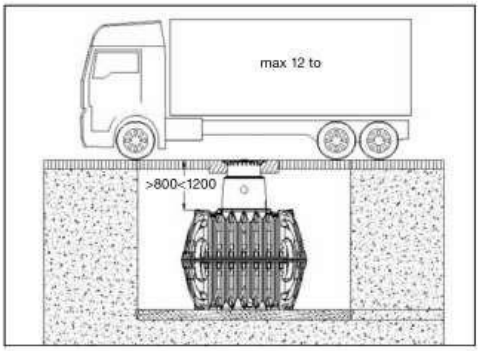
Maximum coverage heights with extensions and telescopic dome shaft.



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

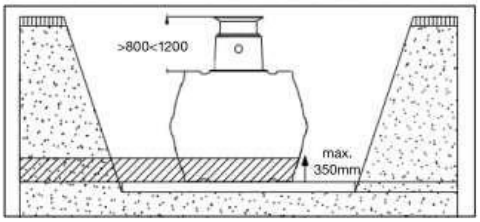


Coverage heights with vehicle loading cover (suitable cover to be provided by others) in areas used by trucks with a max. weight of 12 t.



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

The immersion depth is 350 mm.



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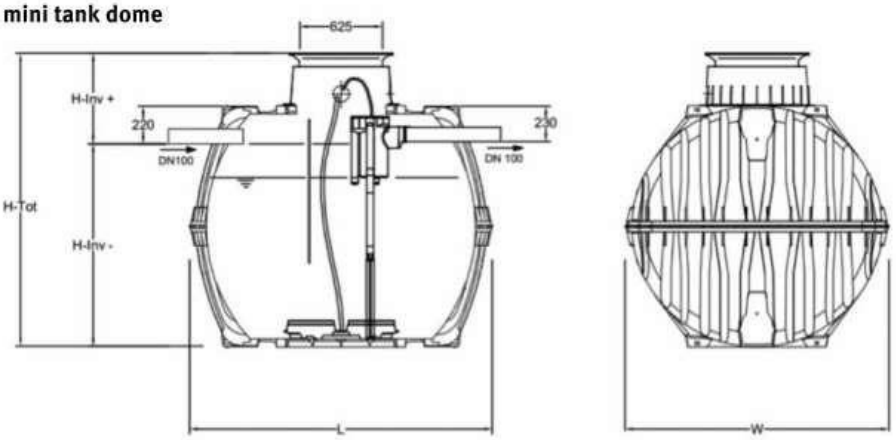
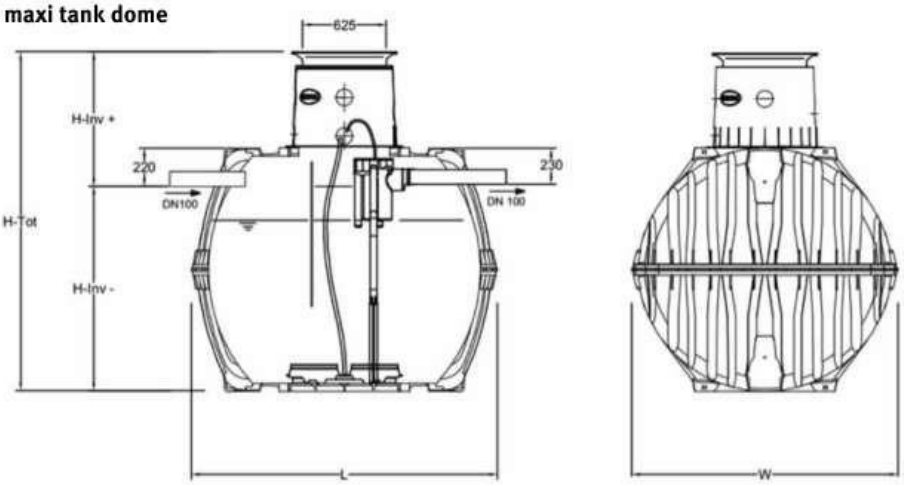
3 Tank invert levels

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-Inv -	1370mm	1600mm	1880mm
H-Inv + *		650 to 1420mm	
H-Tot	2020 to 2790mm	2250 to 3020mm	2530 to 3300mm

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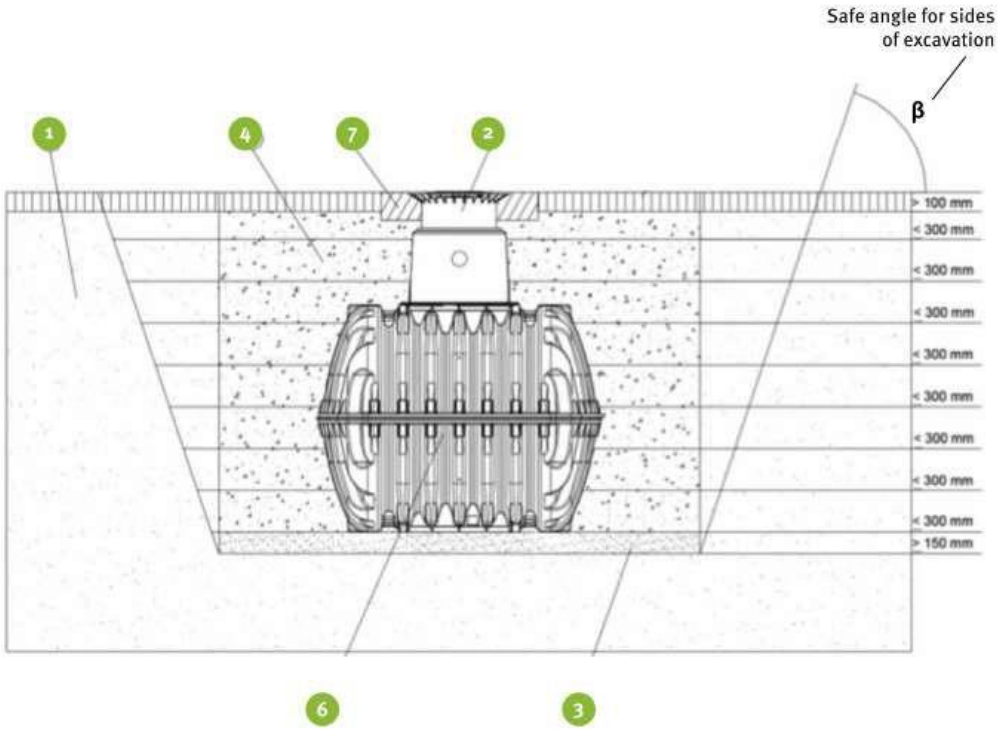
4 Tank installation

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



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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.

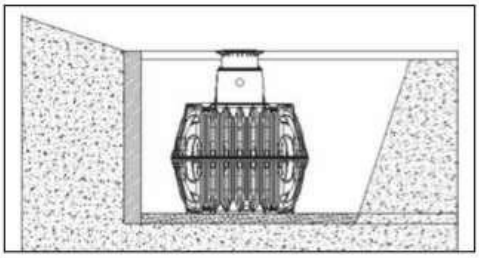
The trench embankment must be designed so that slippage or collapse of the embankment wall is not to be anticipated. The construction site must be horizontal and plane and must guarantee sufficient loadbearing capacity.

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.

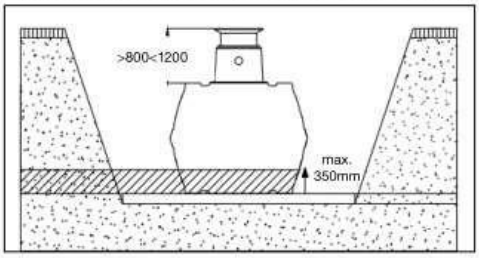
On installation of the tank in the immediate vicinity (< 5m) of a slope, earthen mound or slope, a statically calculated supporting wall must be erected to absorb the soil pressure. The wall must exceed the dimensions of the tank by at least 500mm in all directions, and must be located at least 1000mm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

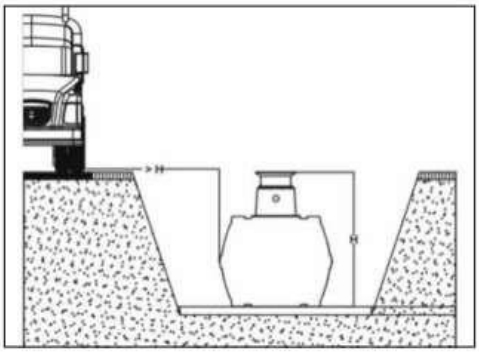
Dissipation of the drainage water (e.g. via an annular drainage system) is recommended in the case of cohesive, water-impermeable soils.



Population Equivalent	5 PE	7 PE	9PE
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.



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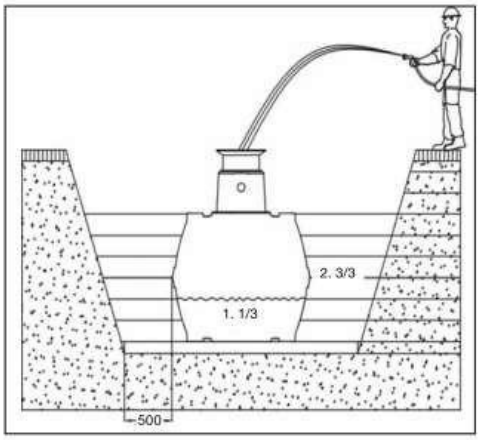
4 Tank installation

Insertion and filling

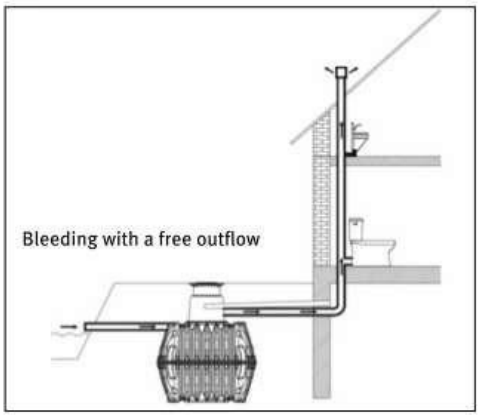
The tanks must be inserted, impact-free, into the prepared trench using suitable equipment. The tank is filled with 1/3 water before starting to backfill.

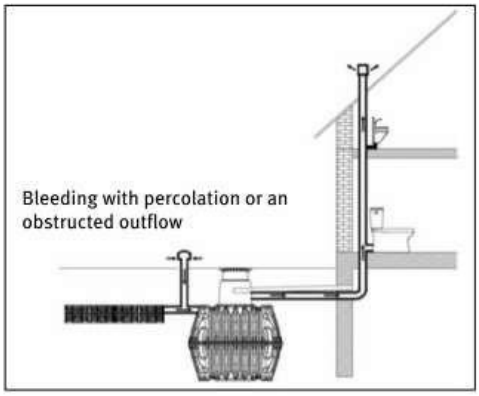
Afterwards the surrounding (roundgrain gravel, max. grain size 10 to 20mm) is then filled in layers of max. 30 cm steps and is compacted. The individual layers should be manually tampered to ensure no voids. Damage to the tank must be avoided during compaction. Mechanical compaction machines must not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





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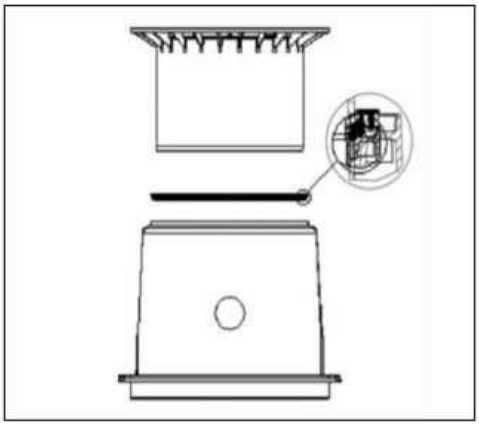
4 Tank installation

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).

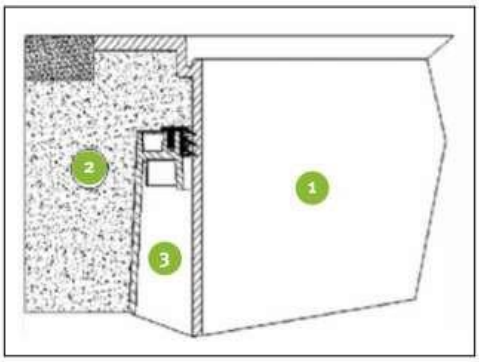
For assembly purposes, the enclosed profile seal (material EPDM) is inserted into the tank dome's sealing groove and is coated generously with soft soap (do not use mineral oil-based lubricants, as these attack the seal). The telescope is then greased, inserted and aligned with the surface of the site.



Telescopic dome shaft on which persons may walk

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

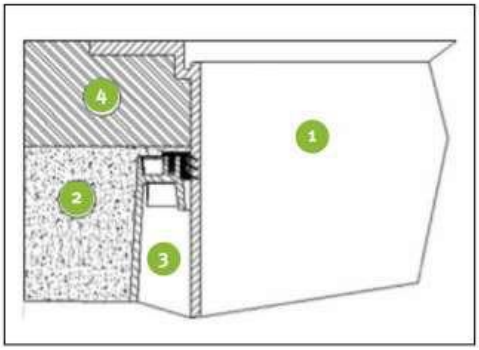
Damage to the tank dome ③ and telescope must be avoided during this step. The cover is then positioned and is sealed to prevent entry by children. **Tighten the threaded connection on the cover so tightly that it cannot be opened by a child!**



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 ③ (colour anthracite) must be supported with concrete ④ (load class B25 = 250 kg/m²). 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).



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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 28th 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

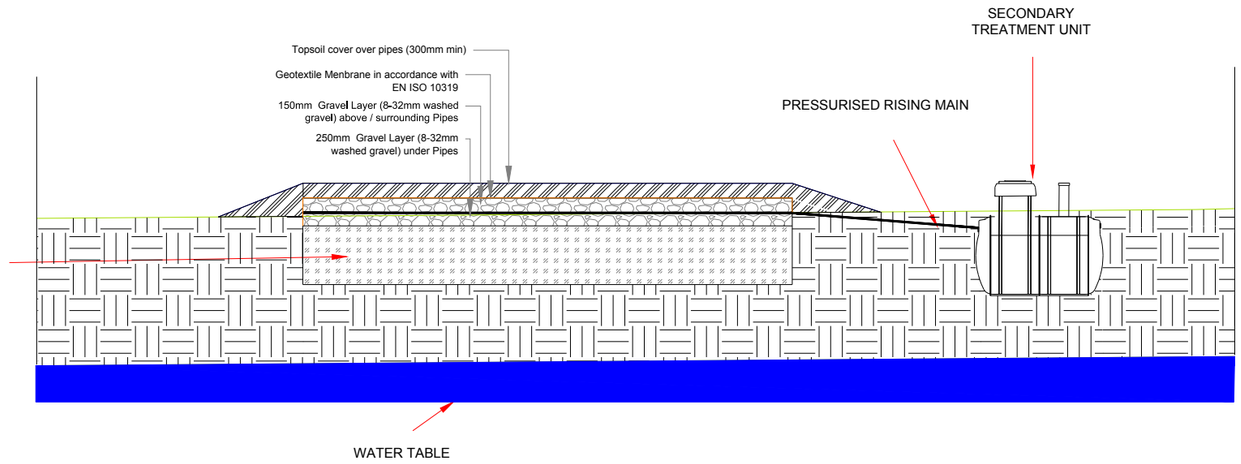
This contract shall expire at the end of 2023 at which time the parties may extend it by agreement in writing. Either party may terminate this contract at any time by providing written notice of intent to terminate the contract on a specified date to the other party, at least two weeks prior to the intended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

Signed:_____ For and on behalf of Graf Ireland

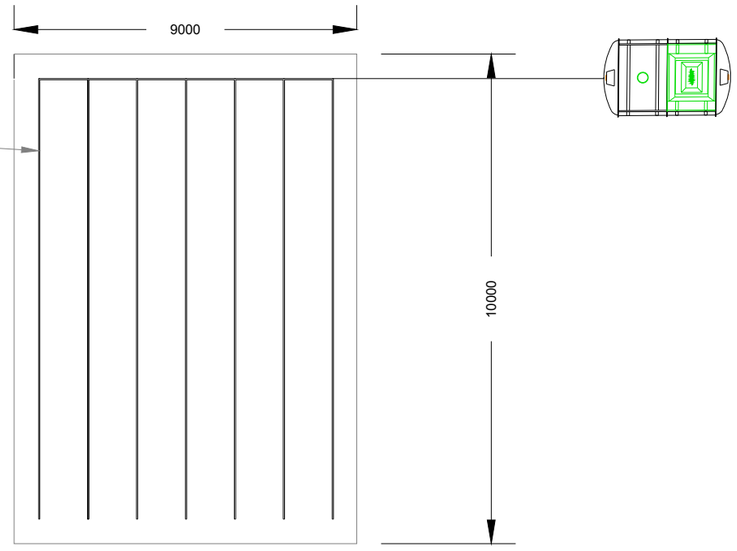
Dated: _____

Signed:_____ For and on behalf of "The Client"

Dated: _____



Section Through Soil Polishing Filter Area



90SQM. Soil Poilshing Filter minimum 0.9m deep.

The treated waste water from the secondary treatment system is pumped to a manifold and percolation pipes (typically PVC pipes) using minimum 25 mm Ø laterals with 4–6 mm Ø orifices facing downwards over a 250 mm layer of gravel. The manifold pipe may be larger and have no orifices. The minimum depth between the distribution gravel and the bedrock and the water table is given in Table 6.3.
The treated waste water must be evenly distributed across the gravel, and low-pressure pipe distribution may be adopted in this context. The detailed bespoke design of the pumped distribution system should be carried out by an appropriately trained and qualified designer and conform to best practice. Loading rates should conform to Table 10.1.
Where a polishing filter is constructed overground or in contact with a very permeable gravel or sand layer in the subsoil, and is pressure dosed into surface distribution gravel, the sides of the filter should be enclosed by an impermeable liner to prevent bypass of flooding doses directly to the ground surface or groundwater

Plan View

Rev	By	Date	Description

Drawing Issue: PLANNING

Drg. Title: Polishing Filter Sections

Client: Galway County Council

Project Description: Proposed wastewater treatment unit and soil polishing filter sections at Barrany, Annaghdown, Co. Galway

Drawings by:
Paul Roche
Ardcarne,
Boyle,
Co. Roscommon
086 3018137

Drg By: P.R.
Ckd By: P.R.
Scale: N.T.S
Date: Feb 2026
Drawing No: PG 001
Rev: P.01

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Site Suitability for Wastewater Treatment

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Awarded to

Paul Roche

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on

14 December 2016

Príomhfheidhmeannach
Chief Executive

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Bronnta ag Dearbhú Cáilíochta agus Cáiliochtaí Éireann faoi Chuid 4 den Acht um Cháiliochtaí agus Dearbhú Cáilíochta (Oideachas agus Oiliúint) 2012
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