

Acorn Lodge Sewage Treatment

BS 6297:2007 was followed as the code of practice for the proposed design and installation of the drainage field for use in wastewater treatment.

Author: George Fletcher Ceng MICE

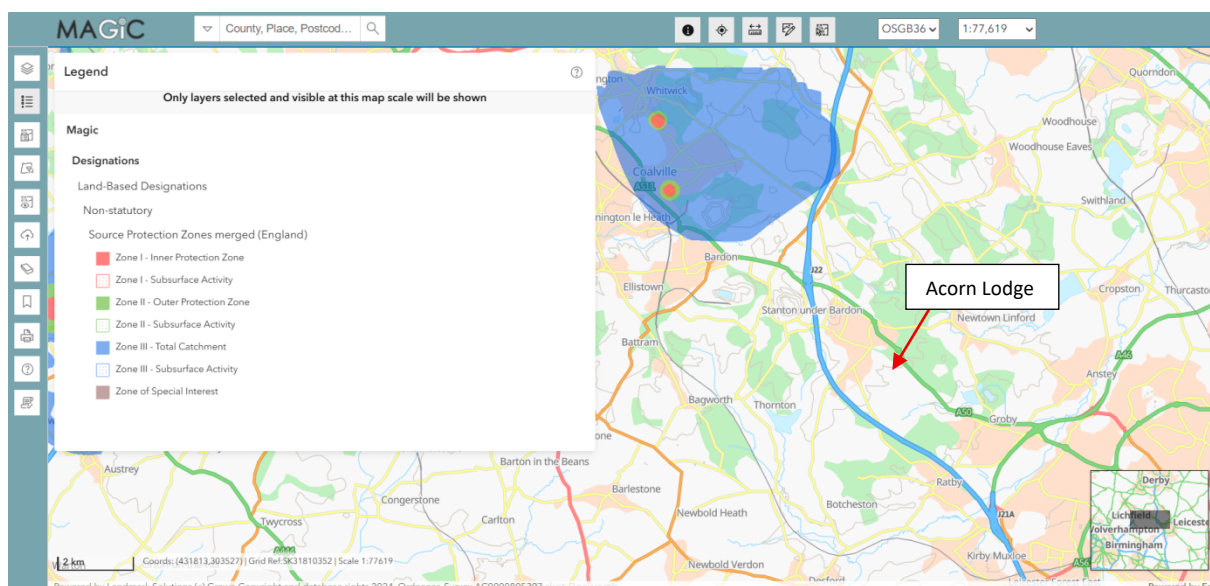
Date: 17/04/2026

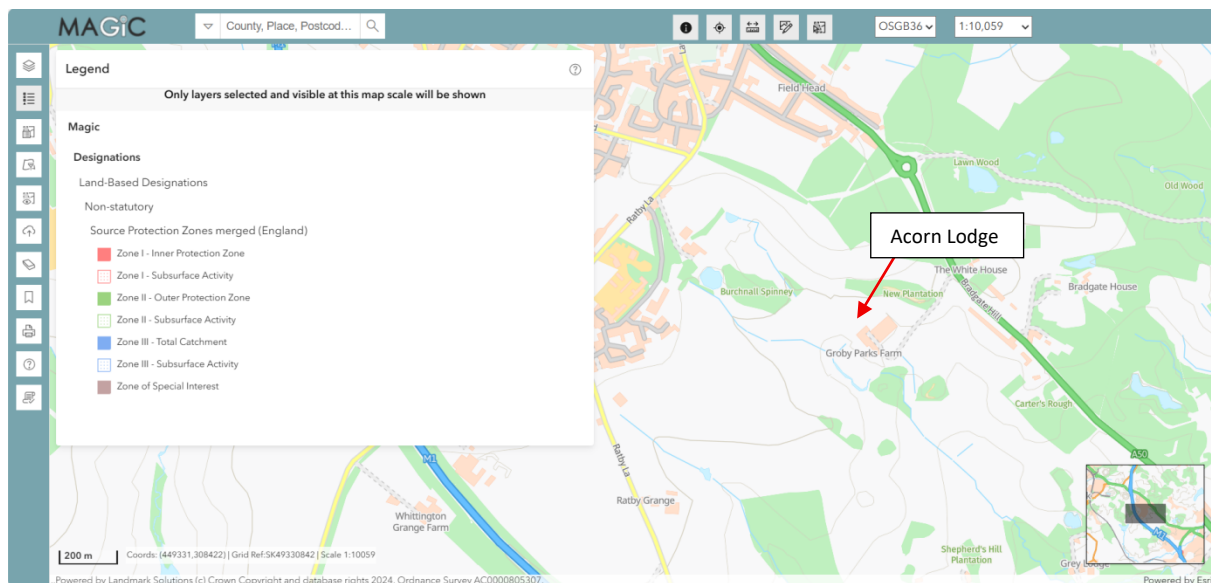
Site details

Description	Information
Details of premises	NGR: SK5004108875 Acorn Lodge (proposed), Leicester Road, Markfield, LE67 9RH Domestic property, maximum anticipated population 6 persons. Mains water supply to property
Flood Zones	Nothing shown within the Environment Agency Sea, rivers and reservoirs extents maps. Environment Agency Surface water flood map shows flooding to the field located to the West of the site following the lower contours of the ground however the building soakaway and planned drainage field will be located outside of this area.
Other Information	There is no well, spring, borehole or source of water supply intended for human consumption within 50m of the planned drainage field. The drainage field is to be constructed in a field that has historically been grass.

Ground water protection zones

As per below the maps from the DEFRA magic website, Acorn lodge and the proposed drainage field sits outside of the Environment Agency's Source Protection Zone.





Trial Hole

A trial hole was excavated as per section 5.4 .1 of BS 6297.

The purpose of the trial hole is to identify:

- Ground water levels and if this is shallow
- Soil characteristics across the depths of the hole with descriptions
- Depth below ground to perform the percolation tests
- If bedrock is encountered and its characteristics.

The trial hole was complete on the 30/03/2026 this is a time of year which is worst case for ground water levels.

Results from the trial hole

Depth (meters) from ground level	Material
0 - 0.3	Topsoil – brown friable
0.3 - 0.5	Silt
0.5- 1.4	Clay – red
1.4-1.5	Grey – mudstone - water table encountered and noted seeping through the layer.
1.5-2.3	Clay – red

Percolation Test

As per section 6.2 of BS6297 a percolation test was completed by the landowner and resulted provided for the calculations. The test was completed in the proposed drainage field location across

3 different trial holes, with the tested repeated 3 times at each location, the results are shown in the below table.

Table of percolation test results

Hole No.	Test Date	Test No.	Start Time 75% Mark	Finish Time 25% Mark	Elapsed Time			Vp(s/mm)
					Hours/minute s (h/mins)	Minutes (mins)	Seconds (s)	Seconds divided by 150mm
1	29/03/2026	1	10:06	12:12	2h 6mins	126	7560	50.4
	29/03/2026	2	13:33	15:34	2h1mins	121	7260	48.4
	29/03/2026	3	16:57	19:06	2h9mins	129	7740	51.6
Average Vp for hole 1								50.1
2	29/03/2026	1	10:08	12:12	2h 4mins	124	7440	49.6
	29/03/2026	2	13:34	15:36	2h 2mins	122	7320	48.8
	29/03/2026	3	16:58	19:07	2h 9mins	129	7740	51.6
Average Vp for hole 2								50
3	29/03/2026	1	10:09	12:13	2h 4mins	124	7440	49.6
	29/03/2026	2	13:34	15:37	2h 3mins	123	7380	49.2
	29/03/2026	3	17:00	19:09	2h 9mins	129	7740	51.6
Average Vp for hole 3								50.1
Average Vp								=50.1

The test results show a consistent scoring across all the trial hole locations and repeated test.

Field drainage disposal can only be used when the average Vps are between 15 and 100 and the investigations from the trial hole test are adequate. From the testing an average score is within this range indicating the site is suitable for a drainage field.



Percolation test photo 1



Percolation test photo 2

Calculations for Trench area and trench length

The drainage field is for a domestic property with a sewage treatment system. It is proposed to use a Klargester BioDisc treatment plant that exceeds the required standard as set by EN12566-3:2005.

As per section 6.3 from BS6297 the following equation can be used to calculate the drainage field area.

$A = p \times V_p \times 0.2$ for package waste treatment works

A = required drainage field floor area in square meters (m^2)

P = number of people served by the tank (for domestic applications this should be the maximum number of people that could live in the dwelling.

V_p = percolation value. V_p average = 50.1

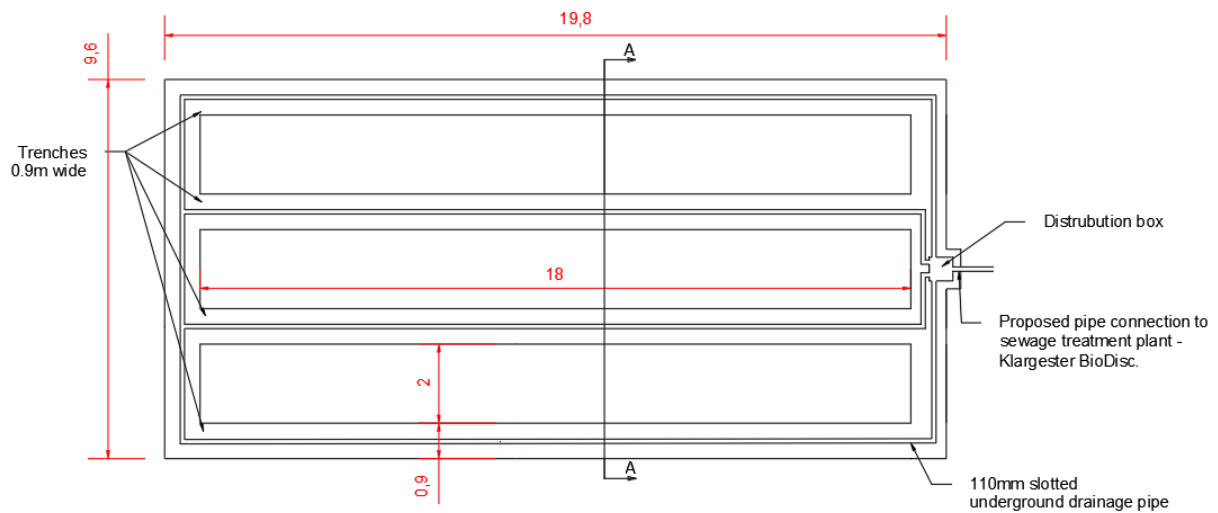
$$A = 6 \times 50.1 \times 0.2 = 60.12 \text{ m}^2$$

As per BS 6297 the drainage trench width is to be between 0.3m to 0.9m. The contractors for the works plan to use a machine with a bucket size of 0.9m wide therefore the planned trench width is 0.9m wide. This is the upper limit of width from the standard.

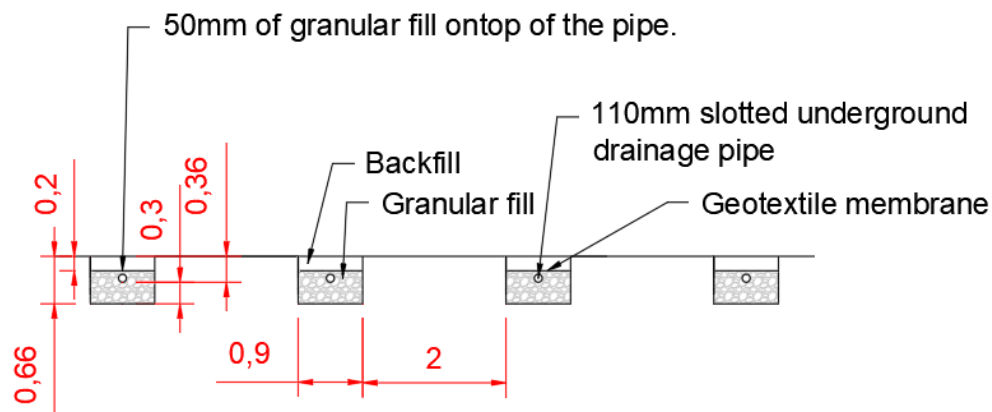
The required area of the drainage field trench = $60.12 \text{ m}^2 / 0.9 \text{ m} = 66.8 \text{ m}$ of linear trench.

Four rows are planned to be used at a length of 18m each this is a conservative approach as equates to an area of 64.8 m^2 and doesn't include the interconnecting pipes with trench surround.

Proposed Plan of Drainage Field (measurements in meters)



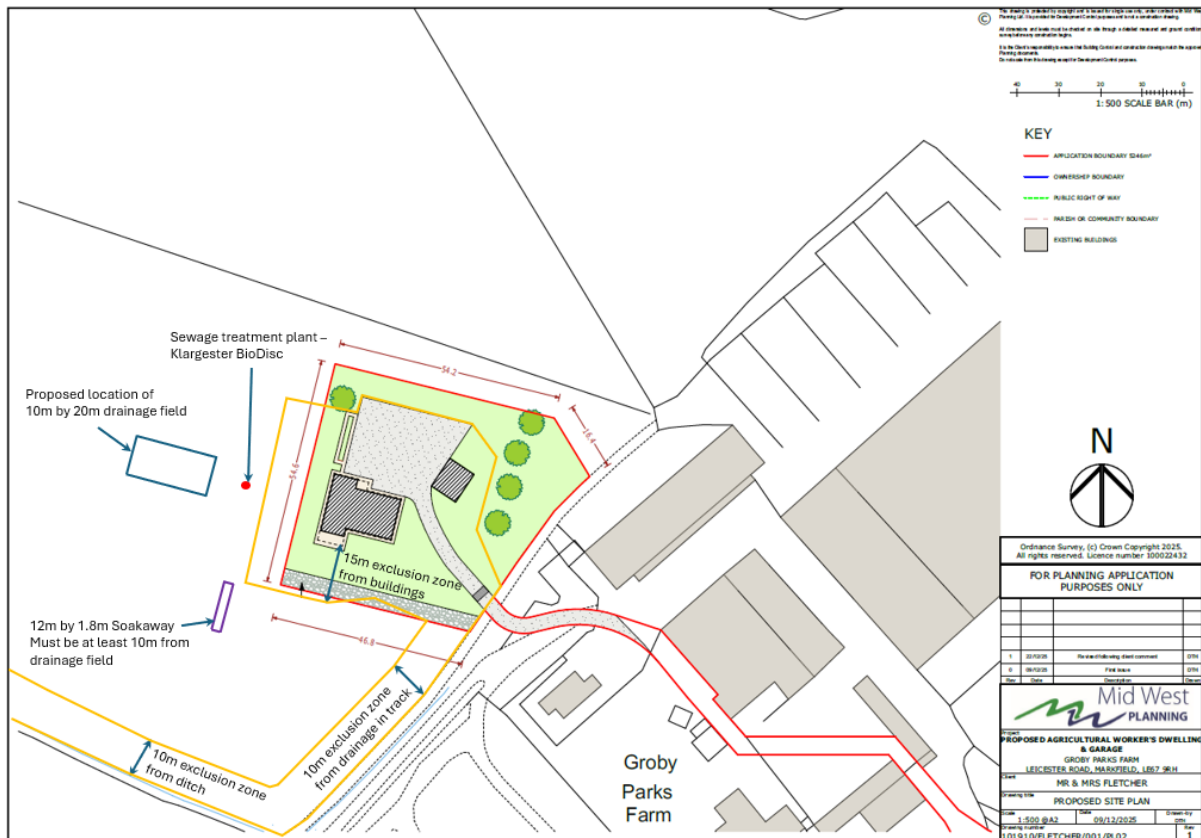
Proposed Cross section A-A – Drainage Field (Measurements in meters)



Cross section A-A

Proposed Drainage Field Location

It is proposed to site the drainage field to the southwest of the dwelling this follows the natural contours of the land so the drainage will flow by gravity to the location. Scaling from the planning drawings it is evident that there is space to site the drainage field considering the various constraints.



Minimum Drainage Field distances

- The drainage field is to be installed at least 15m from any buildings
- The drainage field must be at least 10m from a watercourse or ditch
- At least 50m from water abstraction points, boreholes or springs.

Other Drainage Field Regulations

- No water supply pipes or underground services can be within the drainage field area.
- No access roads, driveways or paved areas should be within the drainage field area. This includes fields with tractor and agricultural vehicular traffic.
- No rainwater must be allowed to enter the system.
- Drainage fields cannot be installed near soakaways.

Construction standards

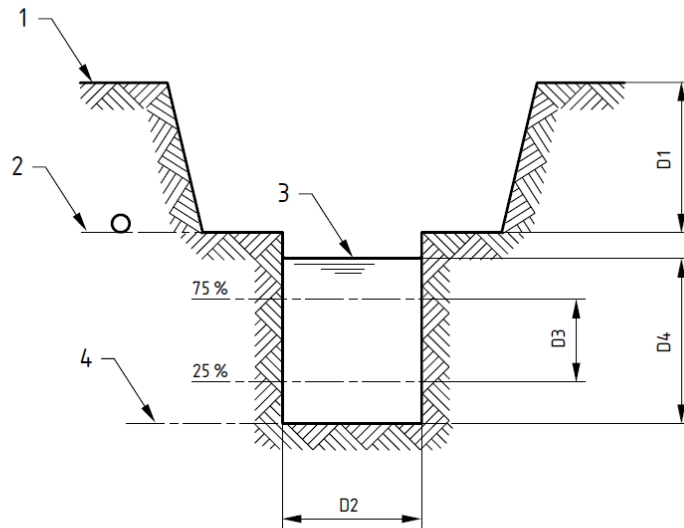
- **Trench Width & Spacing**: Trenches should be 300–900mm wide, with at least 1 metre of undisturbed ground between parallel trenches.
- **Trench Length**: Maximum length of a single trench is 30 metres.
- **Pipe Depth**: Lay pipes between 310mm and 700mm deep to maintain contact with the aerobic soil and drainage stone.

- **Base Material:** Pipes should rest on 300mm of clean shingle, gravel, or broken grade 1 stone (20–50mm).
- **Trench Backfill:** Fill trenches to 50mm above the pipe and cover with a geotextile membrane to prevent silt entry. The rest can be backfilled with topsoil.
- **Distribution:** Unless the drainage field is a single pipe run, a Distribution Box must be installed to evenly distribute the effluent between each pipe run in the drainage field.
- **Pipe Type:** Use solid perforated foul drainage pipes with holes at the bottom and a uniform gradient not steeper than 1:200. Flexible land drainage pipes, tunnel systems or crates are not permitted.

Appendix A – Percolation test methodology

The percolation test should be carried out as follows.

- Excavate at least two holes 300 mm square to a depth at least 300 mm below the proposed invert level (bottom of pipe) of the infiltration pipe, spacing them along the proposed line of the subsurface irrigation system. While digging the hole, note and record changes in soil characteristics at measured depths and the position of the water table if reached. It is advised to take photos and record the depths of these materials.
- Saturate the local soil by filling each hole with water to a depth of at least 300 mm and allow this to seep away completely.
- If the water drains rapidly (within 10 minutes) the hole should be refilled up to a maximum of 10 times. If the water continues to drain away rapidly the ground is unsuitable.
- If the water has not soaked away within 6 hours the area is not suitable.
- Determine the percolation rate by refilling each hole with water to a depth of at least 300 mm and observe the time in seconds for the water to seep away from 75% full to 25% full (i.e. a depth of 150mm). It is advised to take photos of the setup so there is a record of the test set up and the testing being undertaken.
- Divide this time in seconds by 150. This gives the average time in seconds required for the water to drop 1 mm.
- Repeat the test at least three times in each hole in the location of the proposed trench(es).
- Take the average figure from the tests to produce the percolation value V_p (in seconds).
- Obtain the average figure for the percolation value (V_p) by summing all the values and dividing by the number of values used.
- The results from the percolation test should be tabulated as set out in Figure 3. It is advisable to retain this information for the future property owner.



Key

- 1 Ground level
- 2 Proposed invert of infiltration pipe
- 3 Water level inside hole for percolation test
- 4 Base of percolation test hole

- D1 0.3 m
- D2 0.3 m
- D3 0.15 m
- D4 0.3 m