



11th September 2023

PDF BY EMAIL ONLY

Our Ref: 42293R1/Issued/Rev-A

Mr R Lomas
Waterswallows Industrial Park
Waterswallows Road
Buxton
SK17 7JB

Dear Mr Lomas,

**BRE-365 INFILTRATION TESTING
LAND AT EDGEMOOR, BISHOPS LANE, BUXTON, DERBYSHIRE, SK17 6UP**

Peak Environmental Solutions Limited (PESL) is pleased to provide the results of BRE-365 infiltration testing calculations to assist with the drainage design at your proposed development at Edgemoor, Bishops Lane, Buxton, Derbyshire, SK17 6UP.

The site work, including test pit excavation and water filling, for the infiltration testing was undertaken by one of your contractors (with PESL providing guidance and support) on the 10th/11th August 2023; the weather was mainly dry with negligible rain overnight. The testing was undertaken at Trial Pit TP-1 (T1), in line with the attached client supplied drawing.

The testing and infiltration rate calculation has been undertaken in general accordance with BRE Soakaway Design Digest 365 (BRE-365 dated 2016).

Location TP-1 was 1.2m long by 0.45m wide and 1.5m deep and was excavated into shaley clays layers; these layers are likely to represent shallow weathered bedrock (see below). No groundwater or perched water was encountered in the trial pit.

The online BGS mapping via GeoIndex Onshore indicates that the shallow bedrock should comprise mainly mudstone/siltstone (with sub-ordinate sandstones) of the Carboniferous Bowland Shale Formation, which is part of the Craven Group (this lies beneath the Millstone Grit Group). The BGS mapping indicates that superficial/drift deposits (>1m thick) are not likely to be present at the site.

The trial pit was filled once (see below), with water levels during the test monitored by your contractor. The water level monitoring data, ground condition summary/log, infiltration graph and soil infiltration rate calculations are summarised in the Appendix. The testing results should be considered alongside the logged ground conditions and trial pit depths.

After filling, the water level only dropped ~0.1m in about 20 hours; this is indicative of a slow to very slow infiltration rate. Using the BRE365 methodology (see Appendix A), the monitoring data provides the following calculated infiltration rate:

- TP-1/Test-1: 1.1×10^{-6} m/s

This should be considered to be a 'Poor' infiltration rate under BRE365

Given the ground conditions, the slow rate of infiltration over 20 hours and the calculated 'poor' BRE365 infiltration rate, no further tests are considered necessary at this stage. The findings of the testing to date should be considered by your drainage design team.

If you require any further information, please do not hesitate to contact us.

Yours sincerely,

For and on behalf of Peak Environmental Solutions Limited



Christopher Dainton
Technical Director

Limitations of Assessment

This letter report was prepared in September 2023. The report and appendices should be read in the light of any subsequent changes in legislation, statutory requirements, statutory and non-statutory guidance, relevant research and industry practices. Information provided to or obtained by Peak Environmental Solutions Limited has been relied upon in good faith. This report and our project work are subject to our current terms of business and our standard limitations & exceptions.

Encl:

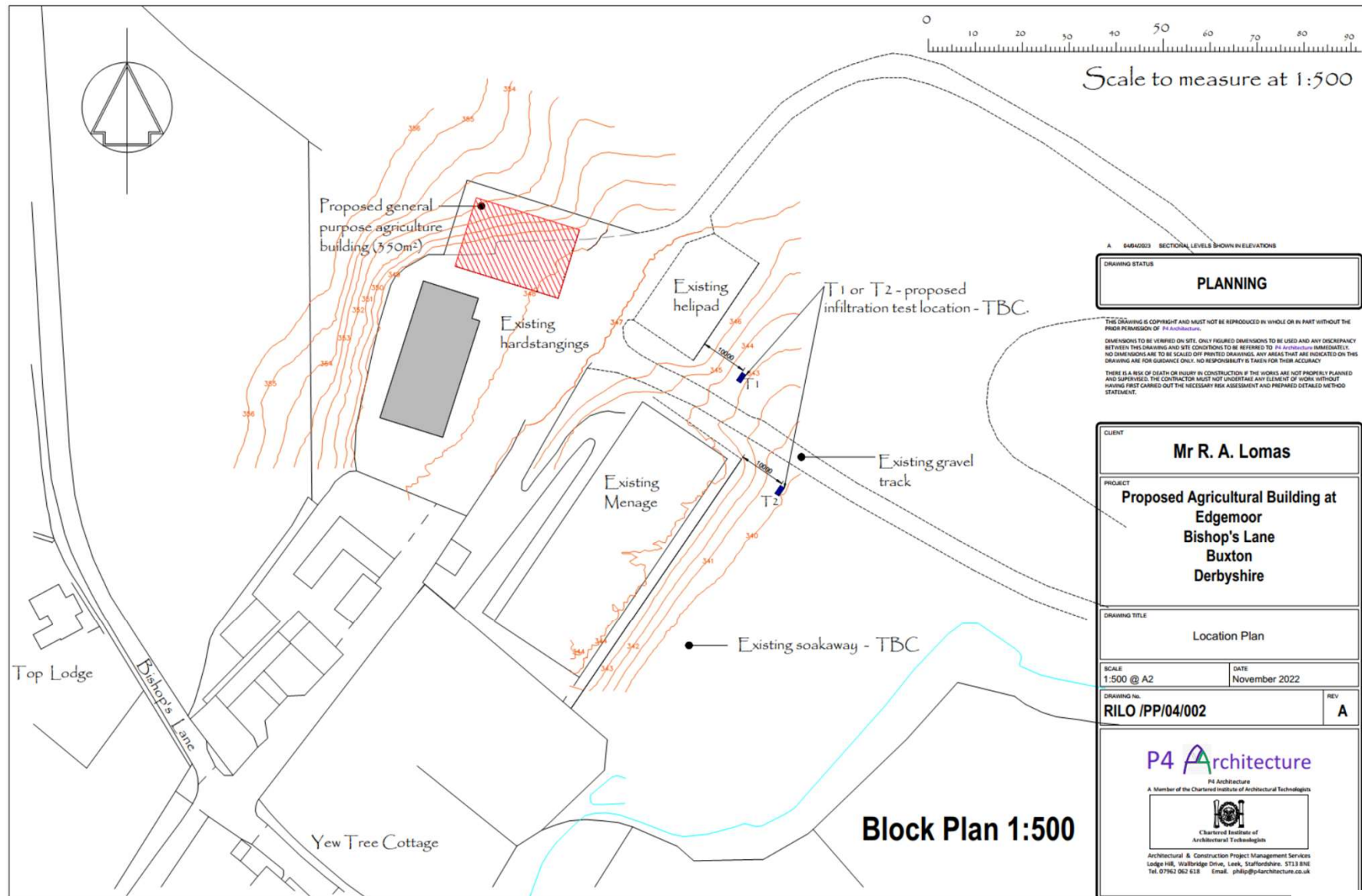
Testing location plan

Appendix: Test-1 calculation sheet

T1 -T2 - BRE 365 TRIAL PIT – 1.5 x 1.0m x 2.0 m deep trial pit to substantiate design of infiltration tank/ soakaway.

NOTES:

- Percolation tests to be undertaken in accordance **with BRE 365 Guidance**, Trial pit dimensions specified above to be reviewed and adjusted in accordance with BRE365 Guidance and/ or site conditions as maybe necessary. Changes to trial pit location and/ or size to be reported to HBL for comments prior to tests being carried out.
- Location and size of the proposed trial pits are shown indicatively and subject to contractor's risk assessment in respect of buried structures, services, root protection zones, etc.
- Trial pit location should be **minimum 5m from any existing and proposed structure.**
- Percolation tests to be carried in virgin ground.
- Where trial pit's locations are near root protection area – site specific, specialist advise should be sought to determine where testing is achievable without adverse impact on trees.



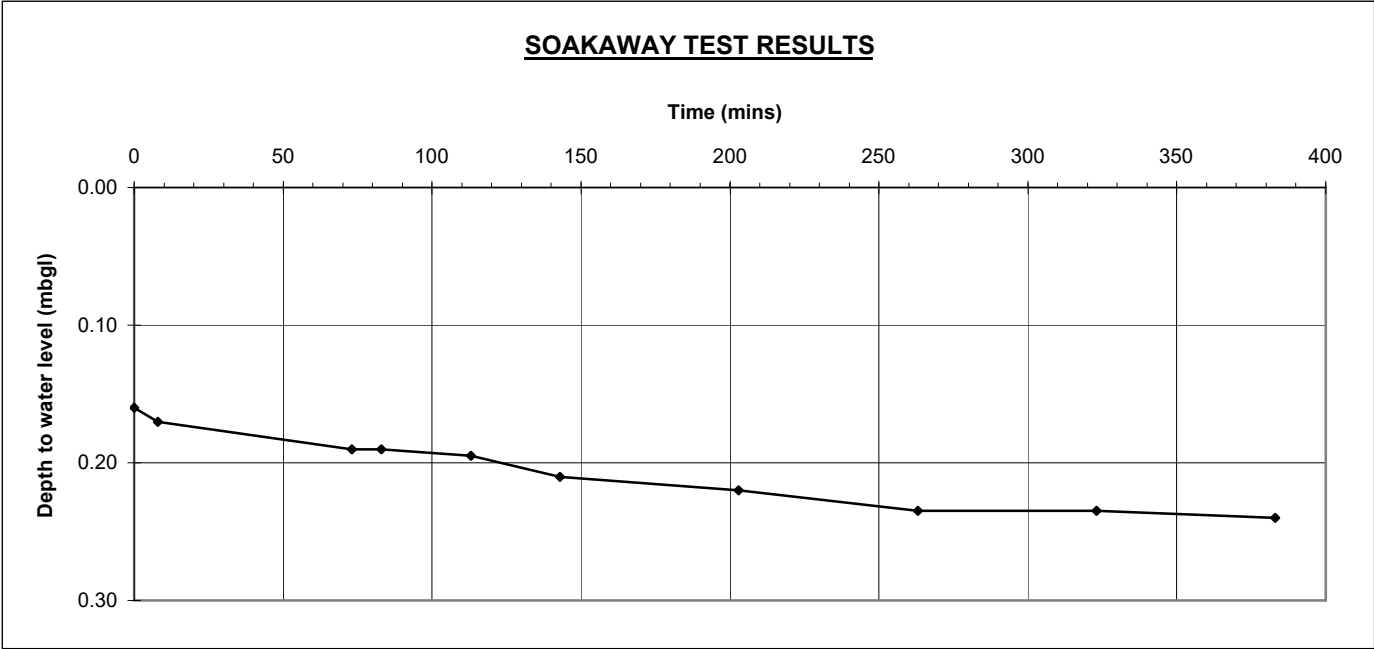
APPENDIX

Calculation of Infiltration Rate in Broad Accordance with BRE Digest 365

Project: Edgemoor Farm
Project No: 42293R1

Trial Pit Dimensions (m) Width Length Depth to Base
1.00 1.40 1.20

Soakaway No. TP-1/Test-1



From above graph;

0.04 m	= Depth drop between 75% and 25% of maximum depth to final depth
163 mins	= Time for outflow between 75% and 25% of maximum depth to final depth

Calculation of Soil Infiltration Rate (f):

where		using
f =	$\frac{VP_{75-25}}{ap_{50} \times tp_{75-25}}$	VP75-25 = Volume outflowing between 75% and 25% of effective depth.
		ap50 = Mean surface area through which the outflow occurs.
		tp75-25 = Time for the outflow between 75% and 25% of the effective depth.
VP75-25 =	0.056 m3	
ap50 =	1.592 m2	
tp75-25 =	163.0 mins	
Gravel Backfill	1.0	Effective porosity (=1 if no backfill)

General Geological Profile :

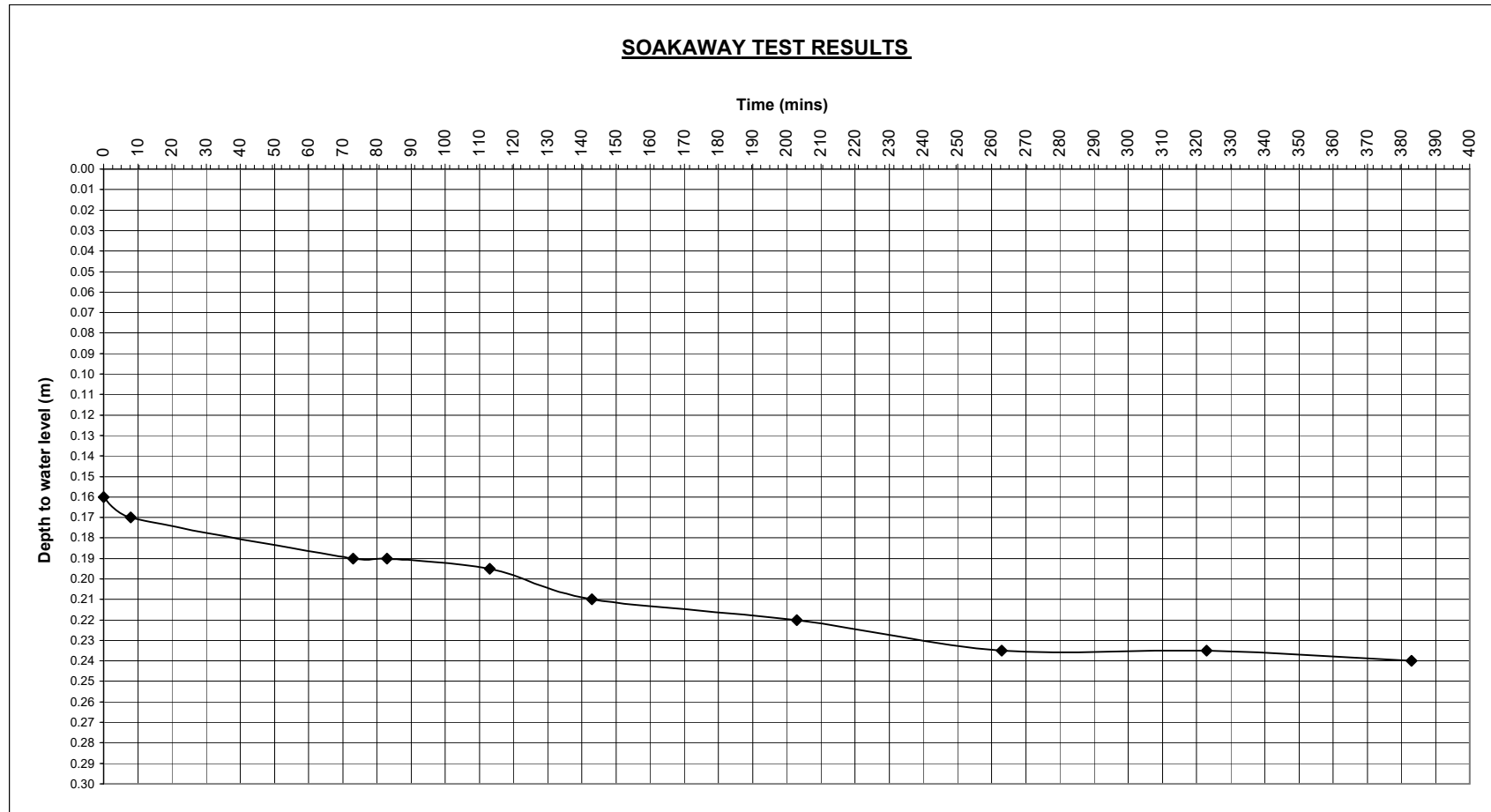
- 0.0 - 0.3m Topsoil
- 0.3 - 1.1m Layers (0.2m to 0.3m) of clayey weathered Shale bedrock

Notes :

No groundwater or perched water observed; weather dry.

Soil Infiltration Rate (f) = 3.6E-06 m/s	Permeability Guideline (m/s)		
	Good	Poor	Practically Impervious
	10 ⁻³ - 10 ⁻⁵	10 ⁻⁶ - 10 ⁻⁷	10 ⁻⁸ - 10 ⁻¹⁰

SOAKAWAY NO. TP-1/Test-1



t0 = 0.160 m
t25 = 0.180 m
t75 = 0.220 m
t100 = 0.240 m
t25 = 40 mins
t75 = 203 mins
t75 - t25 = 163 mins

Job name	Edgemoor Farm	Job no.	42293R1
Soakaway No.	TP-1/Test-1	Test Start Date	11/08/2023

Water levels		
Start Water Level (m)	End Water Level (m)	Effective Depth (m)
0.160	0.240	0.080

TP LOG	
0.0 - 0.3m	Topsoil
0.3 - 1.1m	Layers (0.2m to 0.3m) of clayey weathered Shale bedrock
No groundwater or perched water observed; weather dry.	

0.160	m t0	= water level at Start
0.18	m t25	= 25% depth
0.22	m t75	= 75% depth
0.24	m t100	= water level at End

0.04 m	= Depth drop between 75% and 25%
163.0 mins	= Time for outflow between 75% and 25%

VP75-25	0.056 m3
ap50	1.592 m2
tp75-25	9780 secs
Porosity	1.00 trial pit backfill (=1 if none used)

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