Site
Investigations
♣
Geologists
♣
Environmental
& Geotechnical
Engineers

SOLMEK

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FAO Kais Ali
Euro Garages

Contract Ref: S240634

8th July 2024

Dear Kais,

PERMEABILITY TESTING AT STANLEY HOUSE, BLACKBURN

SCOPE & INSTRUCTION

The works described in this letter report were carried out by Solmek, to the instructions of Euro Garages (EG), on a plot of land at Stanley House, Further Lane, Mellor, Balckburn, BB2 7NP (Appendix A, Figure 1).

Permeability testing was requested. The fieldwork and testing were generally carried out according to the recommendations of BS5930: 2015 "Code of Practice for Ground Investigations" and all stratum descriptions are as recommended in that publication. The information provided in this report is based on the investigation fieldwork and is subject to the comments and approval of the various regulatory authorities.

There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Solmek reserve the right to alter conclusions and recommendations should further information be available or provided. Any schematic representation or opinion of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed necessary.

FIELDWORK

The fieldwork was carried out by Solmek on 8th July 2024. The extent of the investigation was:

- 2no machine excavated trial pits (TP01 and TP02) to a maximum depth of 2.00m below ground level (bgl).
    - The trial pit locations and depths were specified on-site by the client.
- Infiltration testing within both pits.

The trial pits were backfilled with clean arisings upon completion.

Descriptions of the strata encountered in the trial pits together with details of sampling and groundwater are presented in Appendix B of this report. A plan showing the location of the trial pits can be found in Appendix A (Figure 2). Photographs of the trial pits are provided in Appendix A.

GROUND CONDITIONS

Made Ground

Topsoil was encountered in both locations to depths of 0.20 to 0.40mbgl. Topsoil generally comprised slightly sandy slightly gravelly clay with gravel constituents of sandstone, limestone, wood and rootlets.

Made ground was encountered to depths of 0.50mbgl in TP01. The made ground consisted of gravelly clayey sand with ash. The gravel comprised primarily of sandstone, limestone, mudstone, fabric, metal and wood with a total thickness of 0.30m. No made ground was encountered in TP02.

Natural Deposits

Proven to underlie the topsoil deposits in TP02 and made ground in TP01, natural ground generally comprised firm becoming stiff mottled sandy slightly gravelly clay, encountered to a maximum depth of 2.00mbgl. Occasional lenses of slightly gravelly clayey sand were present in some areas measuring approximately 0.20m in length and 0.05m thick.

Groundwater

Within TP01, groundwater was encountered at 1.90mbgl and in TP02 at 2.00mbgl.

It should be noted the rapid rate of advancement of the exploratory holes may mask minor seepages and it should be borne in mind that water levels fluctuate with a number of influences including season, rainfall, dewatering and pumping activities.

RESULTS

Infiltration testing was undertaken within the three trial pits. The testing was generally carried out in accordance with BRE Digest 365: Soakaway Design.

Below gives a summary of the infiltration rates recorded for TP01 and TP02, whilst full results are appended to this report.

Trial Pit	Test No.	Infiltration Rate ($x10^{-6}$ m/s)	Starting Water Level (mbgl)	Pit Depth (m)	Description of Base stratum
TP01	1	1.35*	0.93	1.90	Firm becoming stiff mottled sandy slightly gravelly CLAY
	2	1.07*	0.96		
TP02	1	3.10*	0.75	2.00	
	2	4.71*	0.73		
**Inferred infiltration rate as water did not fully soakaway*					

Soakaway drainage, if incorporated, should be designed in accordance with BRE *Special Digest 365 – Soakaway Design*.

We would like to take this opportunity to thank you for using Solmek.

Yours sincerely

S Donald
Geotechnical Engineer

For and on behalf of Solmek Ltd

APPENDIX A

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Figure Title

Site Location Plan

Project Number

S240634

Project Name

Stanley House, Blackburn

Client

Euro Garages

Date

July 2024

DRG Number

Figure 1

Scale

1:1500 @ A4 [DO NOT SCALE]

Legend Key

Project Bounds - Project Bounds

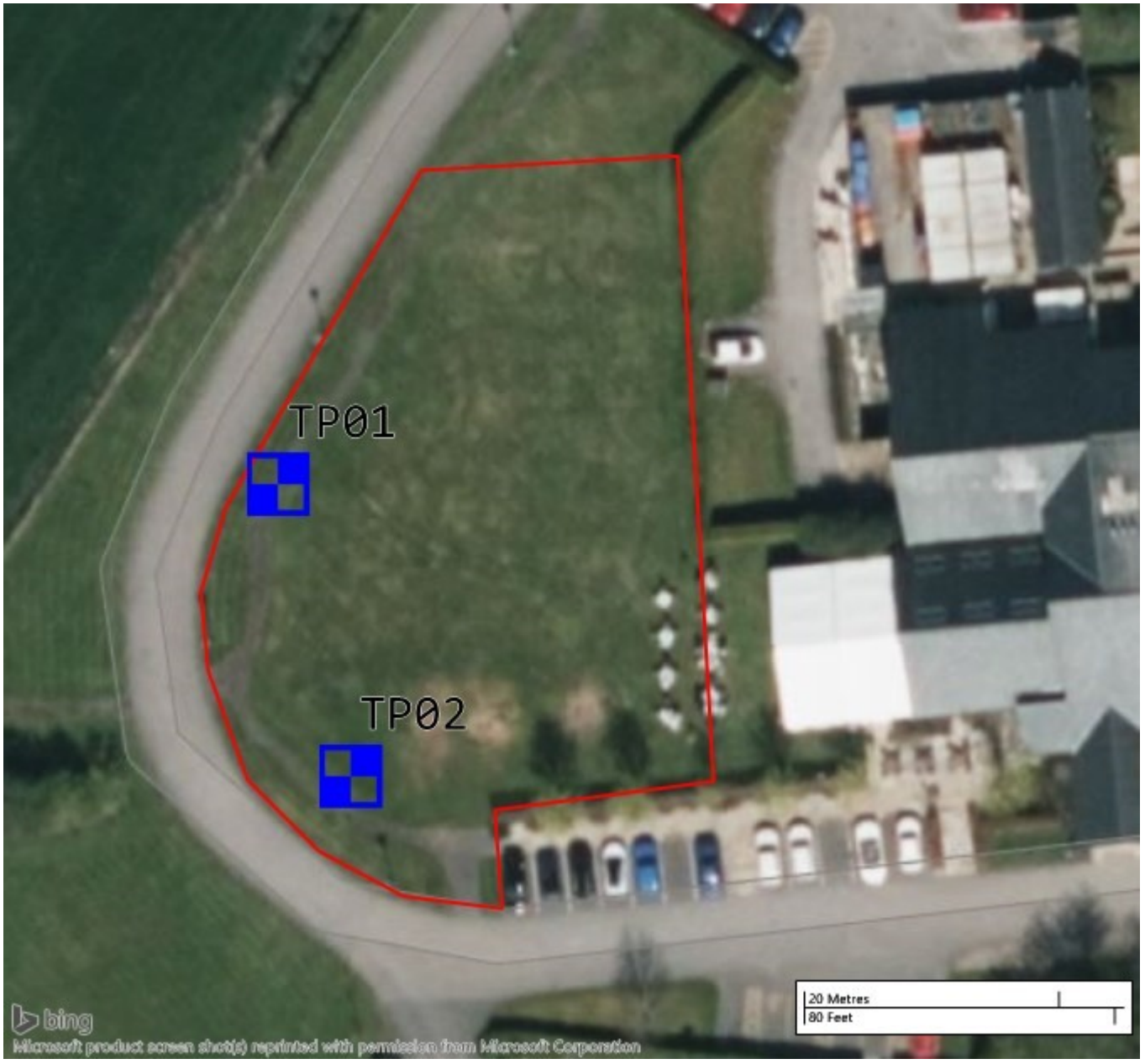

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Figure Title

Site Investigation Plan

Project Number

S240634

Project Name

Stanley House, Blackburn

Client

Euro Garages

Date

July 2024

DRG Number

Figure 2

Scale

1:500 @ A4 [DO NOT SCALE]

Legend Key

- Locations By Type - Empty
- Locations By Type - TP
- Project Bounds - Project Bounds

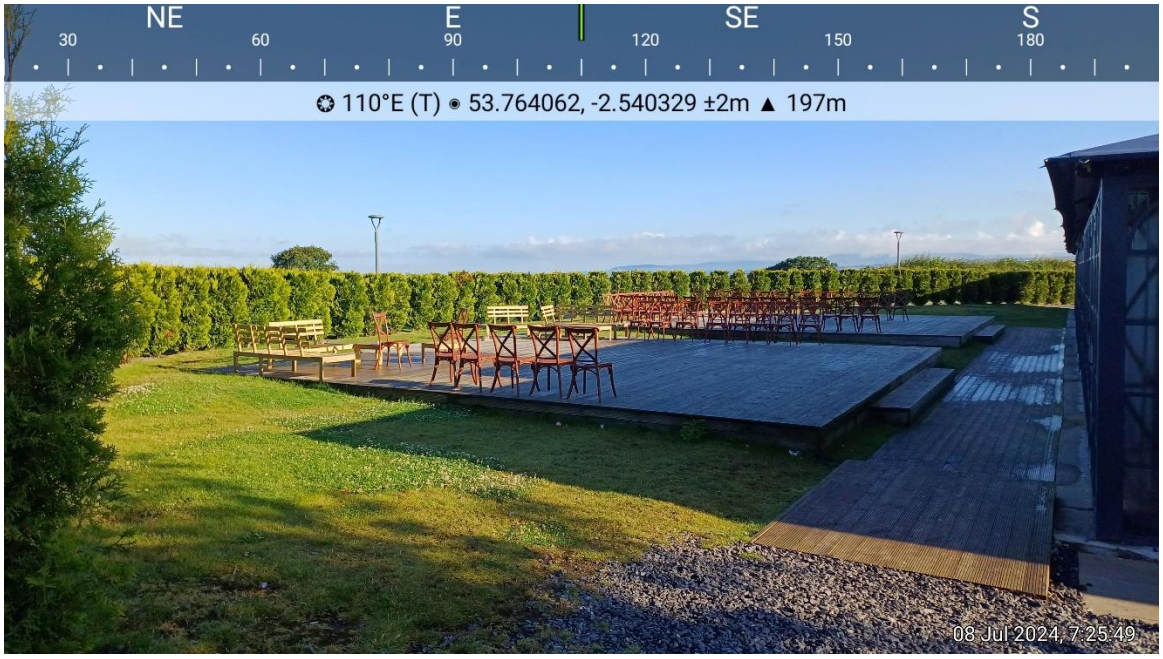

Photo 1: Photo of site looking West

Photo 2: Photo of site looking East

Title	**Date**
Site Photos	July 2024
Project	
Stanley House, Blackburn	
Client	
Euro Garages	
Key	

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Photo 3: TP02 – Pit

Photo 4: TP02 – Spoil

Title	**Date**
Site Photos	July 2024
Project	
Stanley House, Blackburn	
Client	
Euro Garages	
Key	

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Photo 5: TP01 – Re-instatement

Photo 6: TP02 – Re-instatement

Title	**Date**
Site Photos	July 2024
Project	
Stanley House, Blackburn	
Client	
Euro Garages	
Key	

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APPENDIX B

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Trial Pit Log

TrialPit No
TP01
Sheet 1 of 1

Project Name:	Stanley House, Blackburn	Project No. S240634	Co-ords: 364471E - 429903N Level: 197.00
Plant Used:	Mini-Digger	Dimensions (m): Depth 1.90	1.20 × 0.30
Client:	Euro Garages		Scale 1:26 Logged S.D

Date: 08/07/2024

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20	196.80		MADE GROUND - Dark brown to black slightly sandy slightly gravelly clayey TOPSOIL with low cobble content. Sand is fine to coarse grained. Gravel is fine to coarse grained of sandstone, limestone, wood and rootlets. Cobbles are sub-angled to sub-rounded of sandstone.
				0.50	196.50		MADE GROUND - Brown to grey gravelly clayey Sand with low cobble content. Sand is fine to coarse grained with ash. Gravel is fine to coarse grained, angled to sub-rounded of sandstone, limestone, mudstone, fabric, metal and wood. Cobbles are angled to sub-angled of concrete and paving slabs.
							Firm becoming stiff brown to grey mottled sandy slightly gravelly CLAY with occasional slightly gravelly clayey Sand lenses approximately 0.20m in length. Sand is fine to coarse grained. Gravel is fine to coarse grained, sub-angled to sub-rounded of sandstone, limestone and mudstone.
▼				1.90	195.10		End of Pit at 1.900m

1
2
3
4
5

Remarks: Position cleared of services with C.A.T scan & Genny.
Groundwater Strike noted @ 1.90m at base of pit.

Stability: Stable

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Trial Pit Log

TrialPit No
TP02
Sheet 1 of 1

Project Name:	Stanley House, Blackburn	Project No. S240634	Co-ords: 364476E - 429880N Level: 197.00
Plant Used:	Mini-Digger	Dimensions (m): Depth 2.00	1.10 × 0.30
Client:	Euro Garages		Scale 1:26 Logged S.D

Water Strike	Samples & In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.40	196.60		MADE GROUND - Dark brown to black slightly sandy slightly gravelly clayey TOPSOIL with low cobble content. Sand is fine to coarse grained. Gravel is fine to coarse grained of sandstone, limestone, wood and rootlets. Cobbles are sub-angled to sub-rounded of sandstone.
▼				2.00	195.00		Firm becoming stiff brown to grey mottled sandy slightly gravelly CLAY with occasional slightly gravelly clayey Sand lenses approximately 0.20m in length. Sand is fine to coarse grained. Gravel is fine to coarse grained, sub-angled to sub-rounded of sandstone, limestone and mudstone.
							End of Pit at 2.000m

1
2
3
4
5

Remarks: Position cleared of services with C.A.T scan & Genny.
Groundwater Strike noted @ 1.90m at base of pit.

Stability: Stable

SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991
BRE Digest 365, Figure 2, Page 5

Client:	**Euro Garages**				
Site:	**Stanley House, Blackburn**		**Notes: Groundwater strike noted at 1.90mbgl as seepage**		
Job No:	**S240634**				
Pit No:	**TP01**		**Test No:**	**1**	

CALCULATION OF SOIL INFILTRATION RATE

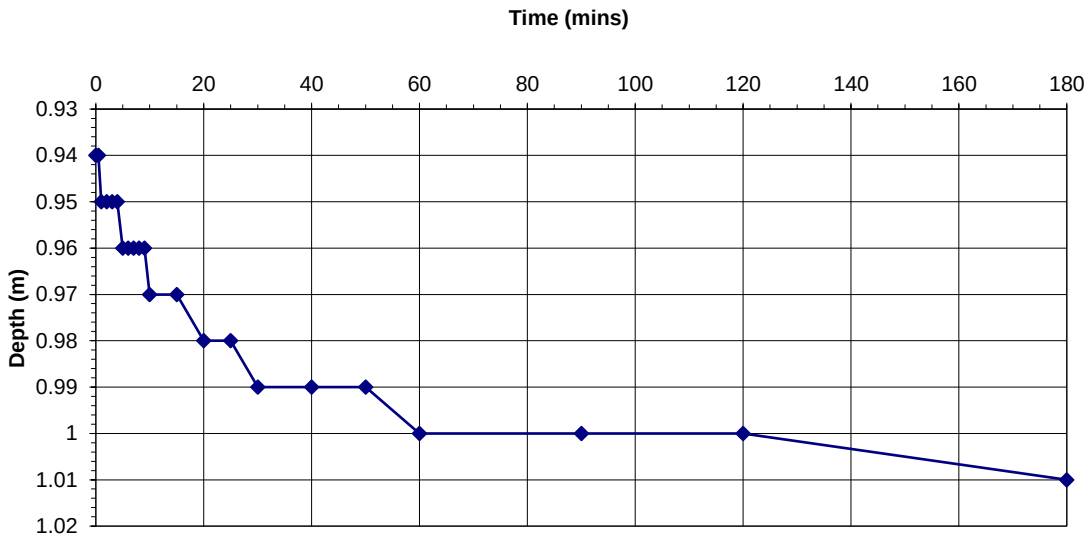
Time (min)	Depth (m)
0	0.94
0.5	0.94
1	0.95
2	0.95
3	0.95
4	0.95
5	0.96
6	0.96
7	0.96
8	0.96
9	0.96
10	0.97
15	0.97
20	0.98
25	0.98
30	0.99
40	0.99
50	0.99
60	1
90	1
120	1
180	1.01

Pit Dimensions		
	Length (m) =	1.00
	Width (m) =	0.30
	Depth (m) =	1.90

Depth at start of test (m) =	0.930
Depth at end of test (m)=	1.010
75% level (m)=	0.958
50% Effective Depth	0.925
25% level (m)=	0.993
Base area of pit (m^2) =	0.300
Vp_{75-25} (m^3) =	0.011
a_{p50} (m^2) =	2.705

From the graph:	
tp 75 (min) =	4.75
tp 25 (min) =	52.5

Soil infiltration rate, f, (m/s) =	**1.35E-06**	**normal test**	
Input by:	**SD**	**Date:**	**08/07/2024**
Checked by:	**LC**	**Date:**	**08/07/2024**



SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991
BRE Digest 365, Figure 2, Page 5

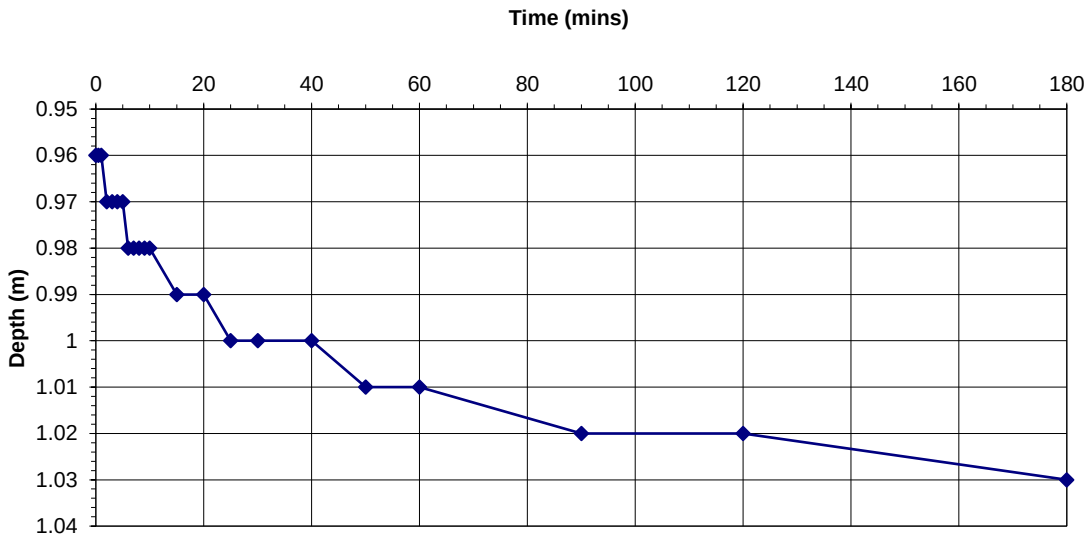
Client:	**Euro Garages**				
Site:	**Stanley House, Blackburn**		**Notes: Groundwater strike noted at 1.90mbgl as seepage**		
Job No:	**S240634**				
Pit No:	**TP01**		**Test No:**	**2**	

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	0.96
0.5	0.96
1	0.96
2	0.97
3	0.97
4	0.97
5	0.97
6	0.98
7	0.98
8	0.98
9	0.98
10	0.98
15	0.99
20	0.99
25	1
30	1
40	1
50	1.01
60	1.01
90	1.02
120	1.02
180	1.03

Pit Dimensions	
Length (m) =	1.00
Width (m) =	0.30
Depth (m) =	1.90
Depth at start of test (m) =	0.930
Depth at end of test (m)=	1.030
75% level (m)=	0.978
50% Effective Depth	0.905
25% level (m)=	1.013
Base area of pit (m^2) =	0.300
Vp_{75-25} (m^3) =	0.011
a_{p50} (m^2) =	2.653
From the graph:	
tp 75 (min) =	5.75
tp 25 (min) =	67.5

Soil infiltration rate, f, (m/s) =	**1.07E-06**	**normal test**	
Input by:	**SD**	**Date:**	**08/07/2024**
Checked by:	**LC**	**Date:**	**08/07/2024**



SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991
BRE Digest 365, Figure 2, Page 5

Client:	**Euro Garages**				
Site:	**Stanley House, Blackburn**		**Notes: Groundwater strike noted at 2.00mbgl as seepage**		
Job No:	**S240634**				
Pit No:	**TP02**		**Test No:**	**1**	

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	0.75
0.5	0.76
1	0.76
2	0.77
3	0.77
4	0.78
5	0.78
6	0.79
7	0.8
8	0.8
9	0.8
10	0.81
15	0.82
20	0.83
25	0.84
30	0.85
40	0.86
50	0.87
60	0.88
90	0.89
120	0.89
180	0.9

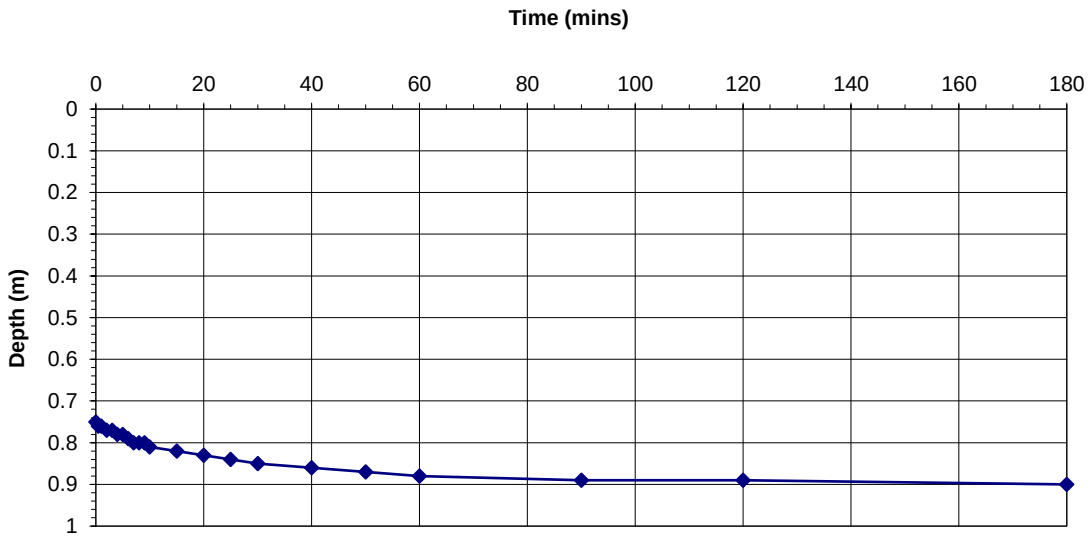
Pit Dimensions	Length (m) =	1.10
	Width (m) =	0.30
	Depth (m) =	2.00

Depth at start of test (m) =	0.930
Depth at end of test (m)=	0.900
75% level (m)=	0.788
50% Effective Depth	1.175
25% level (m)=	0.863
Base area of pit (m^2) =	0.330
Vp_{75-25} (m^3) =	0.025
a_{p50} (m^2) =	3.620

From the graph:	
tp 75 (min) =	5.75
tp 25 (min) =	42.5

Soil infiltration rate, f, (m/s) =	**3.10E-06**	**normal test**

Input by:	**SD**	**Date:**	**08/07/2024**
Checked by:	**LC**	**Date:**	**08/07/2024**



SOAKAWAY DESIGN IN ACCORDANCE WITH BRE DIGEST 365: 1991
BRE Digest 365, Figure 2, Page 5

Client:	**Euro Garages**				
Site:	**Stanley House, Blackburn**		**Notes: Groundwater strike noted at 2.00mbgl as seepage**		
Job No:	**S240634**				
Pit No:	**TP02**		**Test No:**	**2**	

CALCULATION OF SOIL INFILTRATION RATE

Time (min)	Depth (m)
0	0.73
0.5	0.74
1	0.75
2	0.75
3	0.76
4	0.77
5	0.78
6	0.79
7	0.79
8	0.8
9	0.8
10	0.8
15	0.81
20	0.82
25	0.83
30	0.83
40	0.84
50	0.84
60	0.85
90	0.85
120	0.85
180	0.86

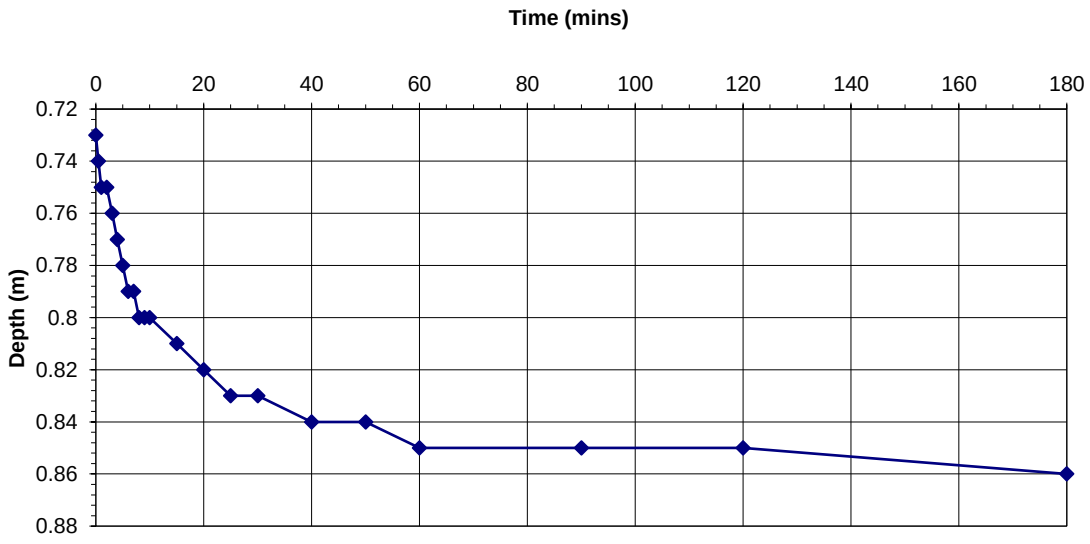
Pit Dimensions	Length (m) =	1.10
	Width (m) =	0.30
	Depth (m) =	2.00

Depth at start of test (m) =	0.930
Depth at end of test (m)=	0.860
75% level (m)=	0.763
50% Effective Depth	1.205
25% level (m)=	0.828
Base area of pit (m^2) =	0.330
Vp_{75-25} (m^3) =	0.021
a_{p50} (m^2) =	3.704

From the graph:	
tp 75 (min) =	3.25
tp 25 (min) =	23.75

Soil infiltration rate, f, (m/s) =	**4.71E-06**	**normal test**

Input by:	**SD**	**Date:**	**08/07/2024**
Checked by:	**LC**	**Date:**	**08/07/2024**



APPENDIX C

♣Solmek conditions of offer, notes on limitations & basis for contract (ref: version1/2024)

These conditions accompany our tender and supercede any previous conditions issued. Solmek will prepare a report solely for the use of the Client (the party invoiced) and its agent(s). No reliance should be placed on the contents of this report, in whole or in part by 3rd parties. The report, its content and format and associated data are copyright, and the property of Solmek. Photocopying of part or all of the contents, transfer or reproduction of any kind is forbidden without written permission from Solmek. A charge may be levied against such approval, the same to be made at the discretion of Solmek.

Solmek cannot be held liable and do not warrant, or otherwise guarantee the validity of information provided by third parties and subsequently used in our reports. Solmek are not responsible for the action negligent of otherwise of subcontractors or third parties.

Site investigation is a process of sampling. The scope and size of an investigation may be considered proportional to levels of confidence regarding the ground and groundwater conditions. The exploratory holes undertaken investigate only a small volume of the ground in relation to the overall size of the site, and can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions as encountered within each of the exploratory holes. There may be different ground conditions elsewhere on the site which have not been identified by this investigation and which therefore have not been taken into account in this report. Reports are generally subject to the comments of the local authority and Environment Agency. The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that mobile contamination, ground gas levels and groundwater levels may vary owing to seasonal, tidal and/or weather related effects. Solmek cannot be held liable for any unrecorded or unforeseen obstructions between exploratory boreholes and trial pits. This includes instances where previous structures on the site (buried man made structures) or the presence of boulder clay (cobbles and/or boulder obstructions) have been anticipated. All types of piling operations should make allowance for obstructions within the construction budget to accommodate this. Unrecorded ancient mining may occur anywhere where seams that have been worked and influence the rock and soil above. Dissolution cavities can occur where gypsum or chalk is present. Rotary drilling is the recommended technique to prove the integrity of the rock.

Where the scope of the investigation is limited via access to information, time constraints, equipment limitations, testing, interpretation or by the client or his agents budgetary constraints, elements not set out in the proposal and excluded from the report are deemed to be omitted from the scope of the investigation.

Desk studies are generally prepared in accordance with RICS guidelines. Environmental site investigations are generally undertaken as 'exploratory investigations' in accordance with the definitions provided in paragraph 5.4 of BS 10175:2011 in order to confirm the conceptual assumptions. You are advised to familiarize yourself with the typical scope of such an investigation. No pumping of water will be undertaken unless a licence or facilities/equipment have been arranged by others.

Where the type, number or/and depth of exploratory hole is specified by others, Solmek cannot and will not be responsible for any subsequent shortfall or inadequacy in data, and any consequent shortfall in interpretation of environmental and geotechnical aspects which may be required at a later date in order to facilitate the design of permanent or temporary works.

All information acquired by Solmek in the course of investigation is the property of Solmek, and, only also becomes the joint property of the Client only on the complete settlement of all invoices relating to the project. Solmek reserve the right to use the information in commercial tendering and marketing, unless the Client expressly wishes otherwise in writing. The quoted rates do not include VAT, and payment terms are 30 days from dispatch of invoice from our offices. Quotes are subject to a site visit.

We have allowed for 1 mobilisation and normal working hours unless otherwise stated. The scope of the investigation may be reviewed following the desk study and/or fieldwork. The presence or otherwise of Japanese Knotweed or other invasive plants can be difficult to identify especially during winter months. If Japanese Knotweed or other invasive species are suspect, it should be confirmed by an ecologist. We have not allowed for acquiring services information, and cannot be responsible for damage to underground services or pipes not shown to us or not clearly shown on plans. Costs incurred will be passed on to you, and in commissioning Solmek you understand and accept that you/your agent have a contractual relationship with Solmek & you accept this. Our rates assume unobstructed, reasonably level and firm access to the exploratory positions and adequate clear working areas and headroom. We have priced on the basis that you or your client have the necessary permissions, wayleaves and approvals to access land. All boreholes and pits are backfilled with arisings except where gas monitoring pipes are installed with stopcock covers. Solmek are not responsible for any uneven surfaces as a result of siteworks and rutting and backfilled excavations may require re-levelling and/or making good by others after fieldwork is complete, and Solmek has not allowed for this. No price has been provided or requested for a return visit to remove pipework and covers. Hourly rates apply to consultancy only and do not include expenses unless otherwise shown. If warranties are required, legal costs incurred will be passed on to you assuming Solmek agree to complete such warranties, modified or otherwise and you understand and agree to pay all costs.

We reserve the right to pursue full payment of the invoice prior to release of any information including reports. We advise you/your client that we may elect to pursue our statutory rights under late payment legislation, and will apply 8% to the base rate for unreasonably late payments. Solmek are exempt from the CIS Scheme. Solmek offer to undertake work only in strict accordance with conditions covered by our current insurances, which are available for inspection. Solmek are not responsible for acts, negligent or otherwise of subcontractors and as a matter of policy cannot indemnify any other parties. Professional indemnity Insurance is limited to ten times the invoice net total except where stated otherwise by Solmek. Solmek give notice that consequential loss as a direct or indirect result of Solmek's activities or omission of the same are excluded.