

GROUND INVESTIGATION REPORT**UPON****23 JEKILS BANK,****HOLBEACH ST. JOHN,****LINCOLNSHIRE, PE12 8RF****PROJECT No: SW 22-245****DOCUMENT REF: SW 22-245-GI-01**

Mr Adrian Brotherton
Highgrove Homes (Spalding) Ltd.,
Ashgrove Lodge,
Austendyke Road,
Weston Hills,
PE12 6BX



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1. INTRODUCTION

Acting upon the instruction of Mr Adrian Brotherton of Highgrove Homes, we attended site on 21st July 2022, the purpose being to observe the underlying ground conditions and determine the basic characteristics of the soil strata.

Mechanically excavated trial pits took place, and our comments are based upon a visual inspection of the disturbed samples obtained and the in-situ strata within the trial pits.

We would suggest the groundwater conditions may vary seasonally and that the water levels as recorded at the time of explorations should not necessarily be taken as being constant as they may be subject to fluctuations.

The opinions and comments expressed within this report are based upon ground conditions encountered in the trial pits excavated at the time of our visit.

This report has been prepared for the named client above and should not be relied upon by any other parties, with the exception of the client's professional advisors, for any use without the express written permission of Shields Wilson Limited.

2. LOCATION & DESCRIPTION OF SITE

2.1. Site Location

The site is situated to the south of Jekils Bank, Holbeach St John. Appropriate national grid reference TF 347 183.

A Location plan is contained with Appendix A.

2.2. Site History Description

Desktop study of publicly available historical maps has been undertaken and found the site has not been developed in the last 20 years and has stood as a tarmacked car park.

An extract is contained within Appendix B.

2.3. Site Description

The site currently stands as a tarmacked empty site.

The North of the site is bound by the highway Jekils Bank.

The Eastern Boundary is boarded by a close boarded fence, which separates the proposed site with neighbouring dwelling.

The West of the site is bound by existing hedgerow, separating the proposed site from existing neighbouring garden and residential property

The Southern boundary is formed with a line of established hedgerow and shared with a neighbouring field that is used for arable farming.

At the time of our visit the weather was dry and clear, however there had been some precipitation in the days leading up to the visit.

2.4. Geological Description

Desktop study of the area has been undertaken using the British Geological Society Maps.

The maps indicate the site to be underlain by superficial tidal flat deposits of Sand and Silt over the Ampthill Clay (Mudstone) formation.

This information is based upon publicly available records. An extract is contained with Appendix C.

3. SITE WORK

Two Number trial pits were excavated with the use of mechanical excavator. The siting of these explorations is shown on the Location plan shown within Appendix A.

Soakaway testing was undertaken in accordance with the guidelines contained within BRE digest 365.

A visual inspection of the disturbed samples was undertaken. A description of the strata and test results are shown on sheets SW22-245/TP01 thru TP02. The Trial pit logs are contained within Appendix D.

The soil demonstrated no identifying odours or markers for known man-made contamination and with the historical investigation indicating no previous development being present, no samples were submitted for laboratory chemical analysis testing.

A photographic record of site explorations is contained within Appendix E.

4. GROUND CONDITIONS

The sequence of the strata encountered during the investigation generally conforms to the geology identified by the desk top studies.

The strata encountered in both explorations were very similar and demonstrated a consistent geological profile across the site.

Once the 0.3 – 0.4m of tarmac material was penetrated the strata generally became a brown, grey silty firm clay. This strata continued down to a depth of 1.0m below ground level. From depth of 1m to 2m the material recovered was a orangey brown & black mid firm silty clay, this became softer with depth.

Similar to TP01, the second trial pit had a 0.3m layer of tarmac, below this was a dense yellow and light brown silty sand to a depth of 0.7m. The silty firm clay then became desiccated for a 300mm band to a depth of 1.0m below existing ground level. The material remained a brown and grey silty firm clay that became wetter with depth to a trial pit termination of 2.5m.

Due to the cohesive nature of the material recovered and the close proximity of the trees to the western and southern boundary samples were taken for the laboratory to assess volume change potential.

2 No. Samples were taken to be sent for Laboratory testing in order to determine the Atterberg limits and moisture content of the clays, results of the laboratory testing can be found in appendix D.

The samples returned results of medium shrinkage potential.

5. CONCLUSIONS & RECOMMENDATIONS

The proposed development is understood to comprise of one bungalow constructed using traditional load bearing masonry walls.

Dwellings with structures of this nature are likely to develop foundation loads in the region of 30 – 40 kN/m.

Designs of foundations & floor slabs should take into account the volume change potential of the underlying strata. As such our recommendations are as follows:

The ground floor should take the form of a suspended pre cast concrete beam and block system, designed by the specialist supplier.

There should be a minimum clear void of 300mm beneath the suspended floor due to the laboratory results returning results of medium volume change potential. Laboratory results can be found within appendix D.

It is understood that since the time of the site work the neighbour and plot owner have removed the trees and therefore, due to the medium volume change potential with tree interaction, this site would require a suitably designed raft or trench fill foundation solution. Careful consideration should be taken with regards to the heave protection required due to the clays and large number of trees on the existing site. Engineer designed foundations in accordance with the NHBC chapter 4.2 guidance should be utilised.

In order to ensure additional stresses onto the weaker wet silty clays at depth, allowable bearing stresses should be limited to 50 kN/m².

Furthermore, the results from the BRE 365 infiltration test show that the ground is suitable for an infiltration surface water drainage system, however, the detailed design should bear in mind the likely variable groundwater level and the less permeable strata at depth, as such infiltration drainage should be kept shallow. 2 No. tests were completed in the same test hole on the same day in our experience in the area a third test undertaken on the following day always results in an improved infiltration rate as such a value of 7.12×10^{-6} would be suitable for design purposes.

For and on behalf of **SHIELDS WILSON LIMITED**

A.P.Wilson CEng MStructE

18th November 2022.

APPENDIX A

SHIELDS WILSON e: info@shieldswilson.co.uk t: 01775 729252 STRUCTURAL AND CIVIL ENGINEERING		DATE NOV, 22	SCALE A4 1:250	DRAWING NO. SW 22-245-SK01	REV. -	
PROJECT 23 JEKIL'S BANK, HOLBEACH ST JOHNS, PE12 8RF		TITLE GROUND INVESTIGATION				
CLIENT HIGHGROVE HOMES		STATUS FOR INFORMATION				
		REV.	DESCRIPTION	DRN.	APP.	DATE
		-	PRELIMINARY - FOR APPROVAL	MRB	JL	02.11.22

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0 2.5 5 7.5 10 15 20 25m
1:250

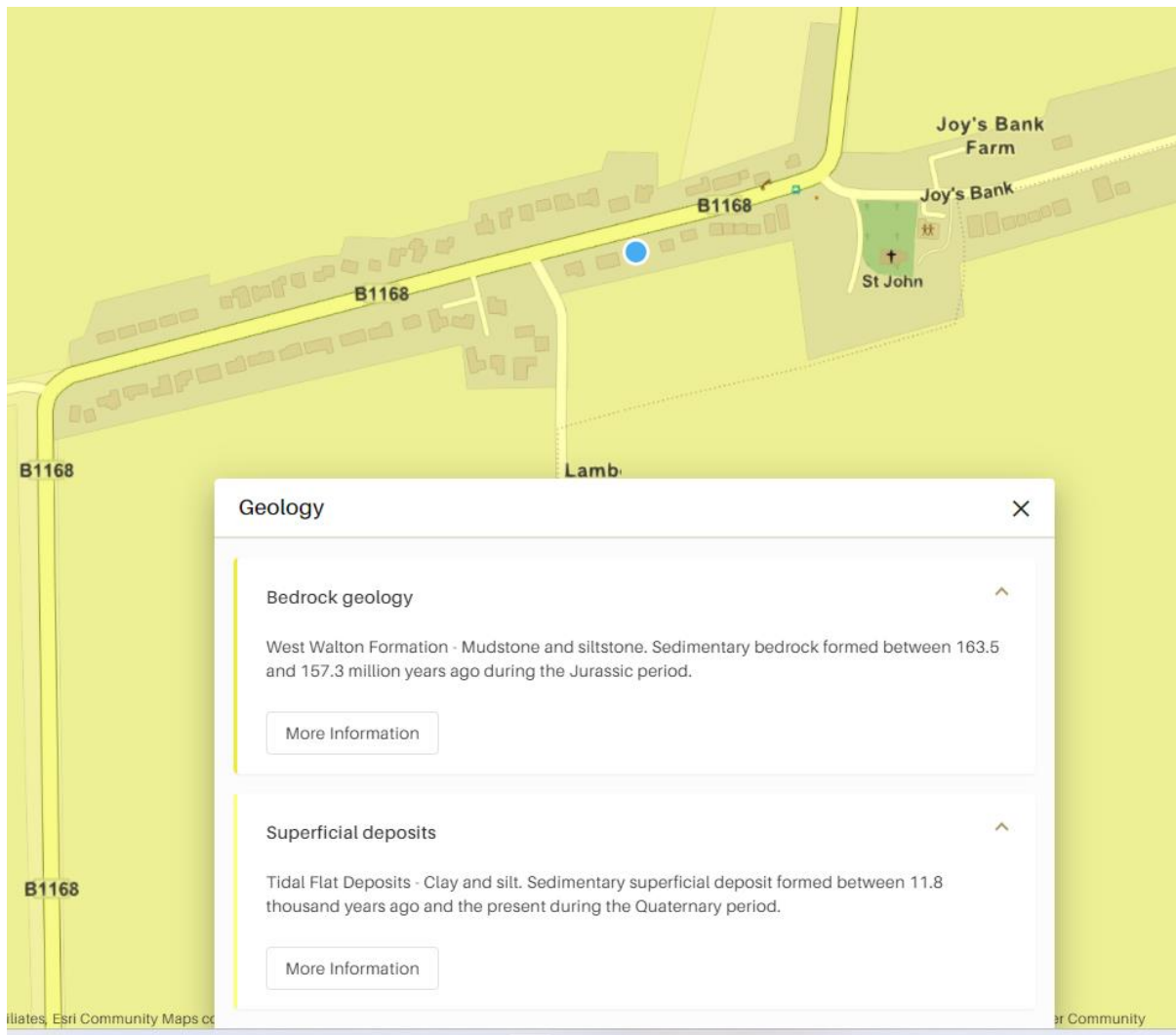
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APPENDIX B



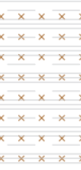
Extract of 1999 Google Map

APPENDIX C



Extract British Geological Society Maps – Bedrock Geology
Extract British Geological Society Maps – Superficial Deposits

APPENDIX D

Location 23 JEKIL'S BANK, HOLBEACH ST JOHNS, PE12 6UL				Project No. SW 22-245		Log Ref TP01		
				Exploration Method Excavator				
				Site Coordinates TF347183				
Carried Out For HIGHGROVE HOMES				Date Undertaken 21/07/22		Logged By APW		
<u>Description</u>	Reduced Level	Legend	Depth (Thick)	<u>Samples</u>			Test Required	Mackintosh Probe
				Depth	Sample Reference	Sample Type No.		
Tarmac & Hardcore			(0.350m) 0.350m					
Brown & Grey Silty Firm Clay			(0.650m) 1.000m					
Orangey Brown & Black Mid Firm Silt & Clay			(1.100m) 2.100m					
Black & Grey Soft Organic Clay			2.100m+					
Remarks At 1.6m Water Seeping in								

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				Project No. SW 22-245		Log Ref TP02		
				Exploration Method Excavator				
				Site Coordinates TF347183				
Location 23 JEKIL'S BANK, HOLBEACH ST JOHNS, PE12 6UL			Carried Out For HIGHGROVE HOMES		Date Undertaken 21/07/22			
					Logged By APW			
<u>Description</u>	Reduced Level	Legend	Depth (Thick)	<u>Samples</u>			Test Required	Mackintosh Probe
				Depth	Sample Reference	Sample Type No.		
Tarmac			(0.300m) 0.300m					
Dense Yellow & Light Brown Silty Sand			(0.400m) 0.700m					
Brown Desiccated Silty Firm Clay			(0.300m) 1.000m					
Brown & Grey Dry Silty Firm Clay			(0.750m) 1.750m					
Brown Silty Clay Becoming Damp			(0.750m) 2.500m					
Black & Grey Soft Clay Slightly Silty			2.500m+					
<u>Remarks</u>								

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PROPOSED NEW DWELLING, EAUGATE ROAD, MOULTON EAUGATE

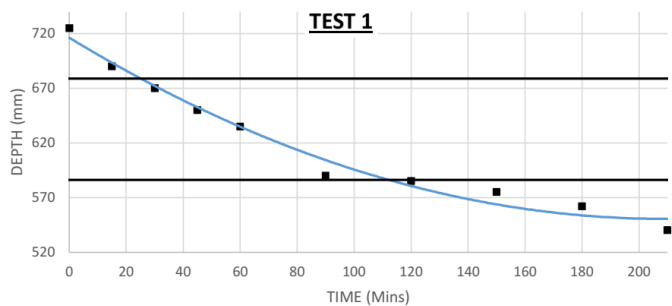
SA01	TEST 1	TEST 2
TIME (Mins)	DEPTH mm (d)	DEPTH mm (d)
0	725	705
15	690	685
30	670	670
45	650	660
60	635	650
90	590	643
120	585	635
150	575	620
180	562	615
210	540	595

INFILTRATION TEST - HOLE SA01

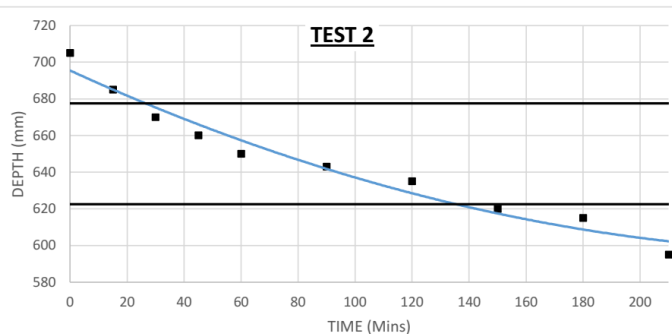
PROJECT NO. 22-217

SITE VISIT: 08/06/2022

TRIAL PIT DIMENSIONS (m)	
A [L]	2.50
B [W]	0.75
C [D]	1.10



SOIL INFILTRATION RATE, f	
TEST 1	
1.34177E-05 m/s	
0.048303713 m/h	



SOIL INFILTRATION RATE, f	
TEST 2	
7.12849E-06 m/s	
0.025662561 m/h	



8180

GROUND ENGINEERING

Newark Road Peterborough

t: 01733 566566

e: admin@groundengineering.co.uk

TEST CERTIFICATE

Determination of Liquid & Plastic Limits

Tested in accordance with BS 1377-2:1990: Clause 4.4 & 5: One Point Method

Client: Shields Wilson Ltd
Client Address: Bank House
Broad Street
Spalding, Lincs
PE11 1TB

Certificate Number: PL7913-1/1/704

Client Reference: L10194
Job Number: PL7913-1

Date Sampled: Unknown
Date Received: 21.07.2022
Date Tested: 01.08.2022

Contact: Adam Wilson

Site Name: Holbeach St Johns

Certificate of Sampling: N/A

Site Address:

Sampling Certificate No.: N/A

Sampled By: Client

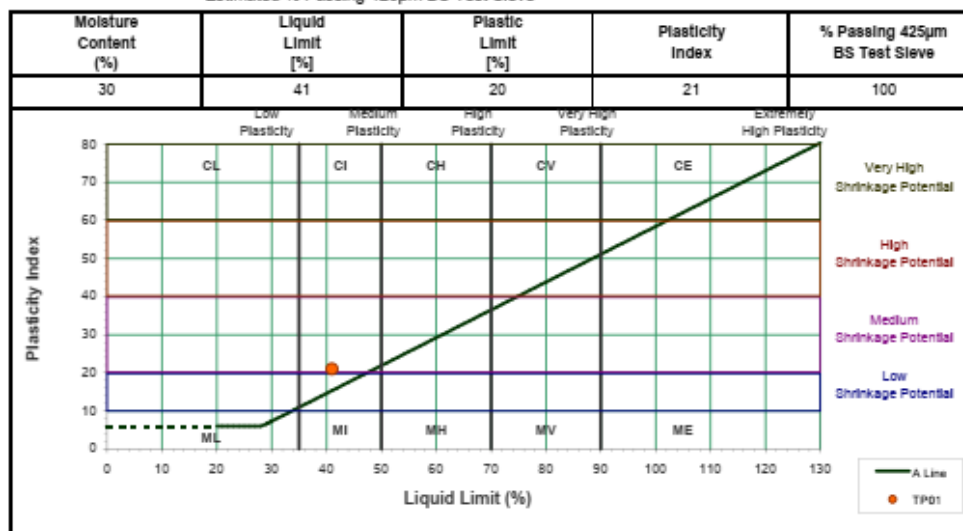
Test Results: Laboratory Reference: PL7913-1/1
Sample Reference: Not Given

Sample Description: Soft friable brown grey-brown SILT/CLAY.

Location: TP01

Depth: 1.05m

Sample Preparation: As Received
Estimated % Passing 425µm BS Test Sieve



Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

for and on behalf of Ground Engineering Ltd

Date Reported: 04.08.2022 Page 1 of 1
Form Number: GELab/C/704 Version 46

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Registered in England & Wales
Registration Number: 6929574
Reg Office: Ground Engineering Ltd
Newark Rd, Peterborough PE1 5UA



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GROUND ENGINEERING

TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2: 1990: Clause 3.2

Newark Road Peterborough
t: 01733 566566
e: admin@groundengineering.co.ukClient: Shields Wilson Ltd
Client Address: Bank House
Broad Street
Spalding, Lincs
PE11 1TB

Contact: Adam Wilson

Site Name: Holbeach St Johns
Site Address:

Certificate Number: PL7913-1/1/705

Client Reference: L10194

Job Number: PL7913-1

Date Sampled: Unknown

Date Received: 21.07.2022

Date Tested: 26.07.2022

Certificate of Sampling: N/A

Sampling Certificate No.: N/A

Sampled By: Client

TEST RESULTS

Laboratory Reference	Sample Reference	Location	Depth Top	Depth Base	Description	Moisture Content [%]
PL7913-1/1	Not Given	TP01	1.05m	N/A	Soft friable brown grey-brown SILT/CLAY.	30
PL7913-1/2	Not Given	TP02	1.20m	N/A	Firm friable brown grey-brown SILT/CLAY with rare shell fragments.	29

Comments:

Approved Signatory: M. Hartnup - Laboratory Manager

Signed:

Date Reported: 04.08.2022

Page 1 of 1

Form Number: GELab/C/705 Version 19

for and on behalf of Ground Engineering Ltd

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APPENDIX E





