# **Materials Management Plan - Minerals**

# Land south of Salhouse Road Sprowston Planning Permission Ref: 2016/0498 Condition 22 Mineral Safeguarding

Kier Living - Eastern



Phone: 01954 261538

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#### 1.0 Background

- In March 2019 an outline planning application (ref 2016/0498) was granted for: 1. Proposed residential development of a minimum 803 dwellings with access roads and associated infrastructure; 2. Site for a new primary school; 3. Land for a Bus Rapid Transit (BRT) scheme; 4. Section of orbital link road; 5. Retained areas of woodland and creation of open space on 36.9 hectares of land lying south of Salhouse Road Sprowston to the north east of Norwich.
- 1.2. The planning permission is subject to a number of conditions including condition 22 which states:

Prior to commencement of each phase or parcel of the development hereby approved the following will be submitted to and approved in writing by the Local Planning Authority in consultation with the Mineral Planning Authority in respect of that phase or parcel:

The Mineral Safeguarding Appraisal, carried out by Clover Planning, will inform a Materials Management Plan-Minerals (MMP-M) for that phase or parcel in so far as the fact that the corresponding part of the site contains a viable mineral resource for prior extraction. The MMP-M for that phase or parcel will consider the extent to which on site materials which could be extracted during the proposed development of that phase or parcel would meet specifications for use on site through testing and assessment. The MMP-M for that phase or parcel shall be submitted to and approved in writing by the Local Planning Authority jointly with the Mineral Planning Authority (Norfolk County Council);

The MMP-M for that phase or parcel should outline the amount of material which could be reused on site; and for material extracted which cannot be used on-site its movement, as far as possible by return run, to an aggregate processing plant.

The developer of that phase or parcel shall keep a record of the amounts of material obtained from on-site resources for that phase or parcel which are used on the development of that phase or parcel and the amount of material returned to an aggregate processing plant, through the MMP-M. The developer shall provide an annual return of these amounts to the Local Planning Authority and the Mineral Planning Authority, or upon request of either the Local Planning Authority or Mineral Planning Authority.

The development of that phase or parcel shall then be carried out in accordance with the approved MMP-M for that phase or parcel.

1.3. To address the National Planning Policy Framework objective to safeguard mineral resources and Norfolk Minerals and Waste Core Strategy (adopted September 2011) Policy CS16 - Safeguarding Mineral and Waste sites and Mineral Resources, a Mineral Safeguarding Appraisal was prepared by Clover Planning in 2016 to accompany the outline planning application. Based on published information and site investigation reports made available at the time, the appraisal concluded that the site contained a superficial glacialfluvial deposit associated with the Sheringham Cliffs Formation which in places up to 13 metres thick overlying the Craig Formation bedrock. There was insufficient borehole information to fully determine the depth of the sand and gravel

deposit across the site and thus it was not possible to attempt to map and quantify the potential resource with any confidence. However, what the available borehole information did confirm is that the site does contain a deposit of sand and gravel, that the deposit is located relatively close to the surface. The sand and gravel deposit is of variable quality and although containing a moderate proportion of gravel and stone, it also contained pockets of clays and silts.

1.4. This Materials Management Plan- Minerals (MMP-M) has been prepared to address the requirements of condition 22. It only relates to 11 hectares on the western side of the original outline planning permission site which is to be developed as a separate parcel. This MMP-M only addresses the recovery and use of primary minerals (sand and gravel) within the site as a proportion of the overall aggregate requirement. All works associated with regard to mineral removal, screening and reuse will be carried out under the Contaminated Land: Applications in Real Environments (CL:AIRE) protocol. A separate Materials Management Plan (MMP) under the CL:AIRE Code of Practice will be prepared either by the contractor Materials Movement or BRD.

#### 2.0 Site location

2.1. The 2016/0498 permission area extends to 36.9 hectares; it lies on the north east side of Norwich adjacent to the existing built up area. The centre of Sprowston lies 200 metres to the north west. Keir Living have acquired approximately 11 hectares of the permission area forming western third of outline permission boundary as shown in Figure 1.

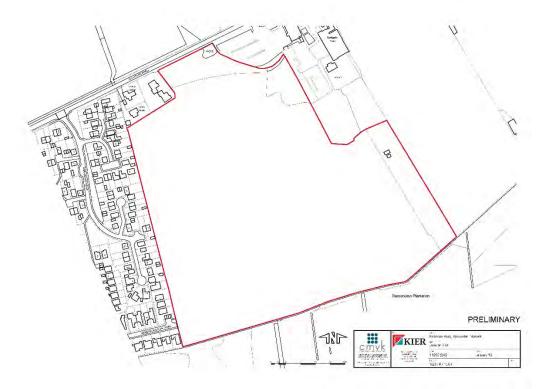


Figure 1 Site Boundary

2.2. The site is generally level, falling from south to north from 37.5 to 35.2 m AoD. The site is predominantly a single grassland field but includes pockets of woodland and scrub along the boundaries. The southern boundary at the western end of the site is marked by an extensive woodland planting. The northern boundary is formed by Salhouse Road.

#### 3.0 Further mineral investigation

- 3.1. The original assessment was based on information made available at the time however BRD Environmental Ltd undertook a Geo-Environmental Site Investigation in June 2018 for Kier Living. These site investigation works included 12. boreholes to a nominal depth of 3m-5m, and a further 41 trial pits to a nominal depth of 3m. An exploratory plan and the hole logs are contained in Appendix A.
- 3.2. The BRD Investigation confirms the presence of the superficial deposits of the Sheringham Cliffs Formation across the entire site comprising several sequences of strata. In the eastern half of the site and along the southern boundary, local patches of soft, orange clayey silt soils have been recorded below the topsoil. Below which dense to very dense, orangey brown, gravelly sands and sandy gravel have been recorded. These dense deposits have been proved across most of the site except to the north western corner of the site, where sequences of medium dense sands with variable gravel and clay content have been recorded to maximum investigation depths of 5.5m below ground level (bgl). Occasionally sandy soils comprising sporadic light grey sandy clay layers and pockets have been recorded above the very dense orange sandy gravel.
- 3.3. Most of the boreholes BRD undertook refused in the dense, orange, gravelly soils due to their high density, and strength at shallow depths of about 2.0m bgl. Generally, dynamic probe tests were undertaken at the base of those boreholes to prove the density of deeper material.
- 3.4. The bedrock (Crag) was not encountered in any of the exploratory holes to maximum investigation depths of 5.5m bgl. This is consistent with previous borehole data, and boreholes drilled on adjoining land.
- 3.5. The Sheringham Cliffs Formation has been mainly recorded comprising dense to very dense, orangey brown, sandy gravel and gravelly sand sequences. These deposits have been proved across the entire site and in some areas directly below the Topsoil (south eastern quadrant).
- 3.6. For the eastern half of the site and southern boundary and above the sand and gravel, soft, orangey brown clayey silt soils have been recorded to depths between 0.5m and 0.9m bgl.
- 3.7. To the north eastern quadrant gravelly, clayey sand deposits have been recorded above the orangey gravel with light grey sandy clay layers. In the north western corner of the site the Sheringham Cliffs Formation was

recorded as sequences of medium dense sandy soils with variable content in clay and gravel deposits.

3.8. Six samples of Sheringham Cliffs Formation were collected and submitted for Particle Size Distribution (PSD) analysis. The recorded Particle Size Distribution curves are shown below in Figure 2. Appendix B contains the PSD results. The PSD test results indicate a predominantly granular material with clay/silt percentages ranging between 4% and 71%, the proportion of gravels range from 10% to 77% and the sand fractions range from 15% to 65%. The PSD results confirmed the borehole log description of a predominantly granular material with clay and the variable nature of these deposits with an average content of 40% gravel, 36% sand and 24% silt and clay encountered across the Site, although with a significant variation in proportions.

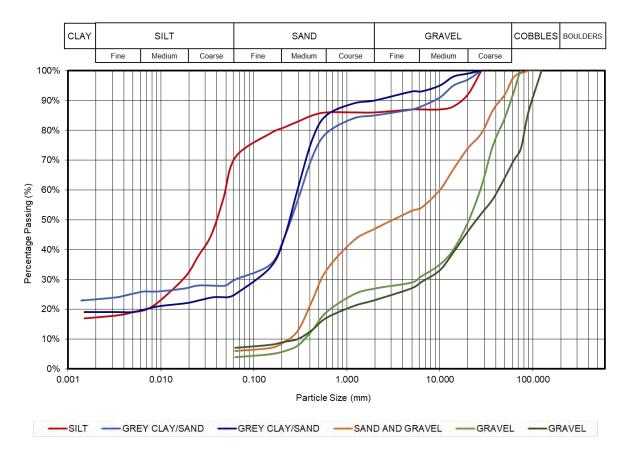


Figure 2 Particle Size Distribution curves

#### 4.0 Proposed development

4.1. Kier Living have acquired interest in approximately 11 hectares of the outline planning permission (ref 2016/0498) area and will shortly be submitting a detailed planning application for the development of this area. The proposed layout of the site is shown in Figure 3 below. It shows the site being developed to provide 251 houses, associated estate roads with a main access off Salhouse Road, landscaping and open space area and infiltration basins for surface water drainage.



Figure 3 Proposed Site Layout

#### 5.0 Anticipated Aggregate won on site

5.1. Based on site investigations sand and gravel materials occur on site and these are likely to be extracted during preliminary site works/groundworks. In particular as part of the initial ground works, three infiltration drainage basins will be constructed requiring the excavation of around 8,000m³ of material. The largest basin, comprising of 2 linked attenuation ponds in the north east of the site, has a design capacity of 5,654 m³. Much of this basin is, according to site investigations, underlain by slightly silty, gravelly sand becoming slightly silty, very sandy gravel at depth of 0.7 metres below the surface. The second basin has a capacity of 1,116m³ and lies in south west corner of the site. The nearest borehole to this basin indicates mixed layers of fine sand with sandy clay layers with some gravel to slightly gravelly, clayey, fine sand with sandy gravel below 2 metres. Given the mix nature of the deposit in this

location it is expected that this excavation will yield a limited amount of suitable aggregate to meet anticipated site needs. The third basin has a capacity of 1,284 m³ and lies in south west corner of the site. The nearest borehole to this basin indicates silty, sandy gravel running to gravelly sand can be expected from a depth of 0.3 metres below the surface potentially suggesting that much of the material won at this excavation could meet anticipated site aggregate needs. Due to the highly variable strata encountered across the site, calculating a percentage of materials suitable for re-use during the construction process is not possible. However, as an estimate it would appear likely that a significant proportion, potentially over 50% would be suitable meaning that 4000m³ of aggregate could be sourced from materials excavated on site.

- 5.2. It is recommended that, as materials are extracted, suitable granular materials are identified and stockpiled separately for used on site as construction material. Subject to the potential use of this material, it may be dry screened on site to make it suitable for the identified potential end use.
- 5.3. The use of on-board weighing equipment in dump trucks and/or loading shovels with can be used to monitor the tonnages extracted and stored/used on site.
- 5.4. In view of the size of the site, the height of the water table and volumes of material likely to be extracted, use of an on-site washing plant is not considered to be a viable option. Any suitable granular material stockpiled that cannot be used on site either as-raised or made suitable by dry screening will be removed from the site.

#### 6.0 Anticipated Aggregate Requirements

- 6.1. Material extracted during the construction process is anticipated to be suitable, with or without processing depending upon the requirement, to meet a range of aggregate needs during site development. Such uses may include hoggin for footpath surfacing, capping material for road, footpaths, drives and parking areas construction, subbase fill for scaffolding bases, bases for garden patios, paths and drainage fill.
- 6.2. Based on the 251 unit layout as shown in figure 3 above (drawing number: 1826/P/10.02) the anticipated aggregate requirements on site are set out in the table below.

Aggregate requirements for Site use	Quantity m <sup>2</sup>	Depth (mm)	Volume (m³)
Hoggin footpath POS	1000	0.15	150.0
Capping to Roads (assumed CBR from 4%-7%)	11873.6	0.25	2968.4

Capping to footpaths (assumed CBR from 4%-7%)	4971	0.15	745.7
Capping to drives & parking area (assumed CBR 4% - 7%)	12023	0.20	2404.6
Sub-base fill to scaffold bases - 2m wide around all houses & garages	11507	0.15	1726.1
Private Paths & Patios	4467	0.15	670.1
Adopted Drainage Foul incl. rising main - assume 450mm trench	1132.65	0.25	283.2
Adopted Drainage Stormwater - average 600mm due to part oversized pipes	1150.2	0.25	287.6
Domestic Foul & Storm - assumed 450mm wide (assumed 15m pp. x 2no)	3402	0.25	850.5
Total Volume of Aggregate required on site			10086.0

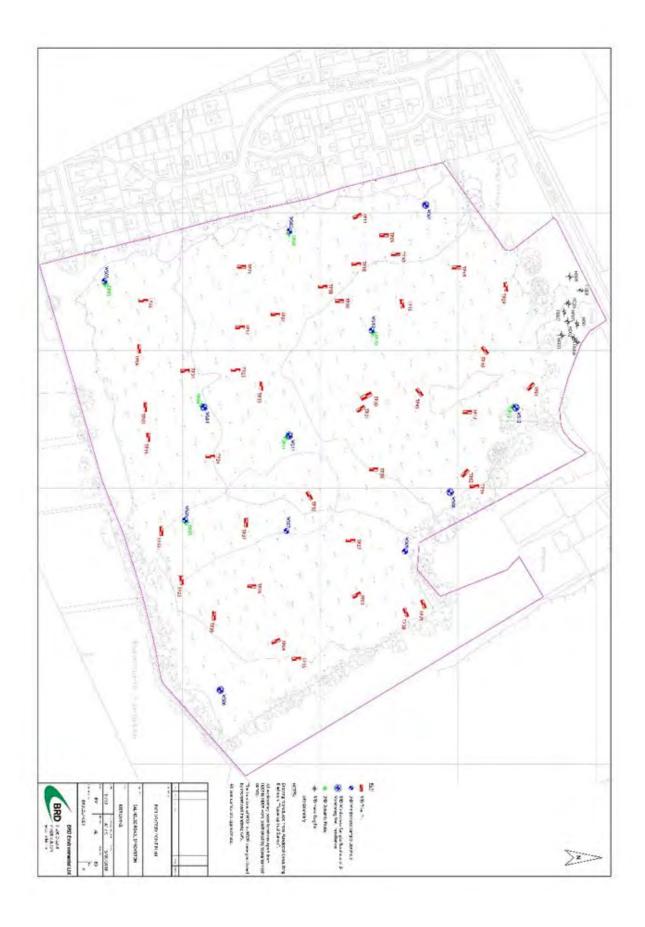
6.3. Based on the above requirements it would seem likely at least half the extracted material arising from construction of the three infiltration drainage basins would prove to be suitable to meet the anticipated aggregate requirements identified as part of this housing development. Due to the highly variable strata encountered across the Site, calculating a percentage of materials able to be re-used during the construction process is not possible. However, if 4000m³ is recovered as an estimate it would make a significant contribution to the identified aggregate need for the proposed development.

#### 7.0 Record Keeping

- 7.1. The Principal Contractor is responsible for delivery of the project on the ground in line with requirements and specifications of MMP-M. Principal Contractor will be responsible for recording the implementation of this Materials Management Plan-Minerals as part of the overall Materials Management Plan for the development of this part of the site.
- 7.2. The records to be kept shall include:
  - The types and quantities of material produced and disposed of off-site;
  - The types and quantities of material excavated and reused on site as raised material
  - The types and quantities of material excavated, processed (dry screened) and used on site.
  - The types and quantities of aggregate material excavated elsewhere and imported to the Site.

- 7.3. Ground Worker / Waste Disposal Contractor is responsible for management of materials on site, recovery of materials on-site and off-site removal of surplus aggregate materials.
- 7.4. It is expected that all aggregate materials excavated but not suitable for reuse on site or requiring further processing will be kept separate and sent for further processing at a local facility.
- 7.5. The chain of evidence for compliance with the MMP-M will be maintained by the Principle Contractor to demonstrate that the processes set out in this MMP-M have been followed.
- 7.6. The evidence will include details of the following:
  - Tracking of the material movements across the site area detailing source of materials and where they were placed;
  - Location of facility where any aggregates are sent for processing;
  - Principal quantities of materials imported on a daily, weekly and monthly basis; and any additional sampling which is considered necessary;
  - · Weekly and monthly progress reports; and
  - A full set of as built drawings.
- 7.7. The documented chain of evidence can be made available to the planning authority to discharge the condition and confirm that works have been completed as agreed and in line with the planning requirements if required.

Appendix A BRD Environmental Ltd borehole logs



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				ense, saturated, orange brown, sitty, sandy CRAVEL. edium, subangular to rounded flint. Occasional large	(3	80 4.81) 80 83.81)	HERINGHAM CI		
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			MADE GROUND/TOPSOIL: Soft, dark brown, slightly gravelly, sitty clay with occasional brick fragments. Gravel of fine to medium, angular flint.	Ξ.		MG/TS			
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			Soft, orange, dayey SILT with roots.  Medium dense, wet, slightly silty, sandy GRAVEL. Gravel of fine to medium, subangular to rounded flint.		40 86.29) 80 85.89)	SHERINGHAM CLIFFS FORMATION	× × × × × × × × × × × × × × × × × × ×
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		R	occasional sandy	ange brown and light grey, silfy, sandy GRAVEL with clay pockets. GRAVEL to cobble. Gravel, some coarse, subangular to rounded flint.	1.6	SHERINGHAM CLIFFS FORMATION		
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	t Stability: Generally stable throughout oundwater: Not encountered		phout		Surface Elevation Level: 36.07 mA		
Plan o	f Trial	Pit:  - 1.8	B 0.6	General Remarks: Terminated at 0.60m bgl to undertake s soakage test.	hallow L	og Scale	BRD 01295 272244

Trial Pit No. Client: Kier Living Project Title: Salhouse Road, Sprowston TP11 Project No: BRD3227 Logged By: A Leon Date Completed: 30/04/2018 Sheet 1 of 1 Method Used: 180° Backhoe excavator (JCB 3CX type) Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No Value TOPSOIL: Soft, dark brown, slighty gravelly, sandy silt. Gravel of fine to 0.10 11 medium, angular flint. 44 44 34 0.25 (35.87) Medium dense, orange brown, gravelly SAND. Gravel of fine to medium, angular to subrounded flint. 0,50 J2 SHERINGHAM CLIFFS FORMATION 0.80 B1 1.20 m: North half becomes gravel to boulder. 1.50 (34.62) Dense to very dense, saturated, light grey to orange, sandy GRAVEL to BOULDER of fine to coarse, rounded flint 2.20 (33.92) Surface Elevation Level: Pit Stability: See General Remarks Groundwater: Seepage at 0.90m and 1.80m 36.12 mAOD General Remarks: Terminated at 2.20m bgl due to pit sides collapsing at 1.50m bgl. All dimensions in metres Log Scale 1:25 Plan of Trial Pit: 2.0 B 0.7 Telephone: 01295 272244 Email: info@brduk.com

Vieth	od Used	1	80° Backhoe excavator (JCB 3CX type)		Snee	t 1 of 1
_	amples & T		Description of Strata	Depth (Leve	/ Geology	Legend
epth	Type & No	Value	TOPSOIL: Soft, dark brown, sandy clay.	(2010		48 48 48 4
					2	40 40 40 40 40 40 40 40 40 40 40 40 40 4
.10	61		Medium dense, orange, yellow and light grey, some natural black stains, slightly gravelly, clayey, fine SAND with firm, light grey, sandy pockets. Gravel of fine to medium, angular flint. Running sands from top	0.30 (33.6	SHERINGHAM CLIFFS FORMATIO	
Grou	tability: indwater: of Trial F	Seep	Ceneral Remarks age at 0.60m  General Remarks: Terminated at 1.50m bgl due to spalling collapse of trial pit wall.		All dimensi ∟og Scale	2 mAOD ons in metre

Proje Logg	ect Title: ect No: led By: Complet	S B A	ier Living alhouse Road, S RD3227 Leon 0/04/2018	Sprowston		T d	TF	13
	od Used			cavator (JCB 3CX type)		10	Shee	t 1 of 1
Sa	amples & T	ests		Description of Strata	Dep		Geology	Legend
Depth	Type & No	Value	MADE CROUND	TOPSOIL: Soft, wet, dark brown, silty clay with brick	(Le)	ver)		*********
			and porcelain frag	ments.	0.4	60 5.04)	MG/TS	
1.00	В1		Soft, orange and li angular flint grave	ight grey, sandy SILT, Occasional fine to medium, I		1.50 (34.14)	ORMATION	
			Medium dense to fine to medium, st.	dense, orange brown, silty, sandy CRAVEL. Gravel of ibrounded flint.	2	50 4.14)	SHERINGHAM CLIFFS FORMATION	
2.30	B2							"0,0"0,0"0,0 %0,0%0,0 %0,0%0,0%0,0 %0,0%0,0%0,0%0
			2.60 m: Becomes	gravelly SAND		70 2.94)		0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 ×
					3	2.84)		
Pit S	tability:	See Ge	l eneral Remarks		4	Surfac	pe Elevatio	
Grou	ndwater of Trial F	: Not e	B 0.7	General Remarks: Terminated at 2.70m bgl due to spalling collapse of trial pit wall.	and	Log	limensi Scale	BRD  D1295 272244

Proje Logg Date	ect Title: ect No: jed By: Complet od Used	B A ted: 3	alhouse Road, § RD3227 Leon 0/04/2018 80° Backhoe exi	cavator (JCB 3CX type)		T.		P14
Sa	amples & T			Description of Strata	Dep	th /	Geology	Legend
Depth	Type & No	Value	clay with occasion flint.  Soft, light brown a	TOPSOIL: Soft, wet, dark brown, slightly gravelly, silty all brick fragments. Gravel of fine to medium, angular and orange becoming orange, clayey SILT with roots.  Saturated, orange brown, silty, sandy GRAVEL. Gravel of abangular to rounded flint. Occasional large flint	1 6.1	95 95 95 95 95 95 95 95 95 95 95 95 95 9	SHERINGHAM CF MG/TS 69	******  *****  *****  *****  ****  ****  ****
	Stability: Generally stable througoundwater: Not encountered in of Trial Pit:  1.5  A  D  A  B  0.7  C			hout	4	Surfa	ice Elevatio 36.05	

Proje Logg Date	t: ct Title: ct No: ed By: Complet od Used	S B A ed: 3	iier Living salhouse Road, & RD3227 Leon 0/04/2018 80° Backhoe ex	Sprowston cavator (JCB 3CX type)		TF	Pit No. P15
Ac 2000	mples & T		Duoknoc cx		Depth /		
Depth	Type & No	Value		Description of Strata	(Level)	Geology	Legend
			MADE GROUND/ with occasional br	TOPSOIL: Soft, dark brown, slightly gravelly, silty clay ick fragments. Gravel of fine to medium, angular flint.	0.25	TS.	
			Soft, orange, clay-	ey SILT with roots.	0,35 (36.21		*
			Medium dense, sa fine to medium, si cobbles.	aturated, orange brown, silty, sandy GRAVEL. Gravel of ubangular to rounded flint. Occasional large flint	1.10	SHERIN	000000
					3		
Pit St	tability:	Genera	l ally stable throug	hout	-4 Si	ırface Elevatio	
			ncountered	244		36.5	6 mAOD
<b>Plan</b> D	of Trial F	7it: 1.5 — A C	B 0.7	General Remarks: Terminated at 1.10m bgl to undertake soakage test.	L	og Scale	BRD 01295 272244

Proje Logg	ect Title: ect No: jed By:	S B A	ier Living alhouse Road, S RD3227 Leon	Sprowston			P16
	Comple od Used		0/04/2018 80° Backhoe exc	cavator (JCB 3CX type)		Shee	t 1 of 1
-	amples & 1			Description of Strata	Depth (Level	Geology	Legend
Depth	Type & No	Value	TOPSOIL; Soft, da medium, angular f	ark brown, slightly gravelly, silty clay. Gravel of fine to lint.		2	78 78 78 78 7 48 78 78 78 78 78 78
			Soft, light brown, g	gravelly, clayey SILT.	0,30 (36.3		× × × × × × × × × × × × × × × × × × ×
			Medium dense, or occasional sandy	ange brown and light grey, silty, sandy GRAVEL with clay pockets. GRAVEL to cobble.	1 1.10 (35.5	SHERING	0000000 000000 000000
					8		
Pit S Grou	tability:	Genera	ally stable throug	hout	4	iurface Elevatio 36.6	on Level 8 mAOD
	of Trial		B 0.7	General Remarks: Terminated at 1.10m bgl to undertake soakage test.	Ļ		ions in metres
		С					01295 272244 @brduk.com

	Complet od Used	ed: 30	Leon //04/2018 30° Backhoe excavator (JCB 3CX type)		Shee	et 1 of 1
-	imples & T	ests Value	Description of Strata	Depti (Levi	h / Geology	Legend
Depth	Type & No		MADE GROUND/TOPSOIL: Soft, dark brown, slightly gravelly, silty clay with occasional brick fragments. Gravel of fine to medium, angular flint.  Medium dense, orange and light grey, slightly gravelly, silty SAND.  Medium dense, saturated, orange brown, silty, sandy GRAVEL, Gravel of fine to medium, subrounded flint.	0.31 (35 0.51	. U	0000000 0000000 00000000
				2 2 3 3 3 3	SHERINGHAM	
Grou	Pit Stability: Slight spalling of sides Groundwater: Slight seepage at 0,5 Plan of Trial Pit:		palling of sides seepage at 0.50m  General Remarks: Terminated at 1.10m bgl to undertake soakage test.			4 mAOD
D	2	A C	B 0.7	ij	Telephone	<b>BRD</b> 01295 272244

Project Title: Salho Project No: BRD: Logged By: A Leo Date Completed: 30/04		S B A	ier Living alhouse Road, Sprowston RD3227 Leon 0/04/2018		TP18		
	od Used		80° Backhoe excavator (JCB 3CX type)		Shee	et 1 of 1	
Sa Depth	Type & No	ests Value	Description of Strata	Dept (Leve		Legend	
			TOPSOIL; Soft, dark brown, slightly gravelly, silty clay. Gravel of fine to medium, angular flint.  Medium dense, orange brown and light grey, silty, gravelly SAND, Gravel of fine to medium, subangular to rounded flint.	- - -	SL 40S	20 20 20 20 20 20 20 20 20 20 20 20 20 2	
			illy stable throughout ncountered		Surface Elevation 36.0	onLevel: 14 mAOD	
<b>Plan</b> D	of Trial I	Pit:  1.6 — A	General Remarks: Terminated at 0.90m bgl to undertake soakage test.  B 0.7		All dimens Log Scale	ions in metre	

Trial Pit No.

Client: Kier Living Project Title: Salhouse Road, Sprowston **TP19** Project No: BRD3227 Logged By: A Leon Date Completed: 01/05/2018 Sheet 1 of 1 Method Used: 180° Backhoe excavator (JCB 3CX type) Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No Value TOPSOIL: Grass over: dark brown, slightly gravelly, sandy clay with roots. Gravel of fine to medium, rounded flint. 44 Mr. Mr. Mr. M. 44 34 34 1 0.20 J1 06, 06, 06, 06 0 08 08 0.30 (35.70) Medium dense, wet, orange brown and light grey, gravelly, clayey, fine SAND. 0.65 J2 B1 SHERINGHAM CLIFFS FORMATION 2,00 (34,00) 2,10 (33,90) Very dense, grey sandy GRAVEL. Gravel to cobble of rounded flint. Pit Stability: See General Remarks Groundwater: Seepage at 0.30m Surface Elevation Level: 36.00 mAOD Plan of Trial Pit: General Remarks: Terminated at 2.10m bgl due to collapse of pit All dimensions in metres Log Scale 1:25 sides. 2.0 B 0.7 D C Telephone: 01295 272244 Email: info@brduk.com

Trial Pit No. Kier Living Client: Project Title: Salhouse Road, Sprowston TP20 Project No: BRD3227 Logged By: A Leon Date Completed: 01/05/2018 Sheet 1 of 1 Method Used: 180° Backhoe excavator (JCB 3CX type) Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No Value TOPSOIL: Grass over: Wet, dark brown, silty day with roots. 1. 34 34 34 40,40,40,40 0,30 11 0.35 (35.72) Medium dense, wet, orange brown and light grey, slightly silty, gravelly, fine SAND. 0.70 J2 SHERINGHAM CLIFFS FORMATION Medium dense to dense, slightly silty, sandy GRAVEL to COBBLE of fine to coarse, subrounded flint. 1.50 B1 1.50 - 1.60 m: Layer of gravelly SAND. Gravel of fine to coarse flint Surface Elevation Level: Pit Stability: See General Remarks Groundwater: Seepage at 0.35m 36.07 mAOD General Remarks: Terminated at 2.30m bgl due to collapse of pit All dimensions in metres Log Scale 1:25 Plan of Trial Pit: Running sands. 2.0 B 0.7 D C Telephone: 01295 272244 Email: info@brduk.com

Proje Logg	ect Title: ect No: jed By: Complet	B A	alhouse Road, S RD3227 Leon 1/05/2018	Sprowston			TF	21
	od Used			cavator (JCB 3CX type)		1	Shee	t 1 of 1
- 2	amples & T	ests		Description of Strata	Dep		Geology	Legend
Depth	Type & No	Value	tures opposition		(Lei	vei)	- 30	****
0.10	J1		made ground/ roots and rare who	TOPSOIL: Grass over: Wet, dark brown, silty clay with ole bricks.			MG	
0.60	12		Medium dense to sandy GRAVEL.	dense, wet, yellow, orange and light grey, slightly silty, Gravel of fine to coarse, subangular to rounded flint.	(3	35 5.88)	NO	000000000000000000000000000000000000000
0,60 J2 0,70 B1					1		FFS FORMATI	
			1.10 m: Frequent	cobbles to boulders of subrounded flint.			SHERINGHAM CLIFFS FORMATION	
1.80	<b>6</b> 2				(3 2 2	80 4 43)		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
					3			
					1-1-1-1			
					4			
Pit S Grou	tability: indwater:	See Ge Seep	ı eneral Remarks age at 0.35m		5.	Surfa	36.20	n Level: B mAOD
Plan	of Trial F	Pit: - 2.0 — - A	<del>-  </del>	General Remarks: Terminated at 1.80m bgl due to collapse sides.	of pit	All	Scale	/
D	1 1	C	B 0.7			Tal		BRD 01295 272244

Proje Logg	ect Title: ect No: jed By:	S B A	ier Living alhouse Road, S RD3227 Leon	Sprowston			P22
	Comple od Usec		1/05/2018 80° Backhoe ex	cavator (JCB 3CX type)		Shee	t 1 of 1
	amples & T			Description of Strata	Dep (Le)		Legend
Depth 0,30	Type & No	Value	TOPSOIL: Soft, da medium, subround	ark brown, slightly gravelly, silty clay. Gravel of fine to ded flint.		27	00,00,00,00 0 00 00 00 00 00 00
0,05			Medium dense to GRAVEL. Gravel rounded flint.	dense, wet, orange and light grey, slightly silty, sandy of fine to coarse, rare cobbles, of subrounded to	(34	35 6.29)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0.70 0.70	J2 B1					FORMATION	
1.40	В2		2,00 m: Occasion	al boulder. Becoming saturated.		SHERINGHAM CLIFFS FORMATION	
2.30	В3				2.4	\$0 4.04)	
Pit S Grou	tability: indwater	See Ge : Seep	eneral Remarks age at 1.90m		4	Surface Elevation 36.6	on Level: 4 mAOD
25.	of Trial		B 0.7	General Remarks: Terminated at 2.60m bgl due to collapse sides.	e of pit	All dimens Log Scale	ions in metres

Proje Proje Logo	Project No: BRD3227 Logged By: A Leon Date Completed: 01/05/2018		Salhouse Road, Sprowston BRD3227 A Leon d: 01/05/2018			TP23		
				cavator (JCB 3CX type)		Shee	t 1 of 1	
	amples & T			Description of Strata	Dept (Lev	th / Geology	Legend	
0.10	Type & No.	Value	TOPSOIL: Soft, da to medium, rounde	ark brown, gravelly, silty clay with roots. Gravel of fine ad flint.		\$7	24 24 24 24 24 4 34 24 24 34 3 20 36 36 36 36	
	J2 B1		Very dense, satura Gravel to cobbles	ated, light orange, sandy GRAVEL to COBBLES, of angular to rounded flint. Occasional boulders.	Langeling La	SHERINGHAM CLIFFS FORMATION		
					3			
Pit S Grou	tability: ndwater	See Ge : Seep	eneral Remarks age at 0.90m		4	Surface Elevation 36.3	on Level: 0 mAOD	
2.1.	of Trial		B 0.7	General Remarks: Terminated at 1.70m bgl due to collapse sides.	e of pit	Log Scale  Telephone:	BRD 01295 272244 @brduk.com	

Proje Logg Date	nt: ect Title: ect No: ged By: Comple od Usec	S B A ted: 0	ier Living salhouse Road, S RD3227 Leon 1/05/2018	Sprowston cavator (JCB 3CX type)		TF	Pit No. P24 at 1 of 1
A	amples & 1		Dacking ext		Dept	16.7	
Depth	Type & No	Value		Description of Strata	(Lev	(el) Geology	Legend
0.20	J1		to medium, subrou	ark brown, gravelly, silty clay with roots, Gravel of fine unded flint.  very dense, wet, orange and some light grey, slightly EL. Gravel of fine to coarse, subrounded to rounded	0.3	<u>S</u>	1 34 34 34 34 34 34 34 34 34 34 34 34 34
0.70	J2		flint. Frequent cob	bles to boulders.	ī	FORMATION	
1,20	B1					SHERINGHAM CLIFES FORMATION	
2.00	B2				2:1	0 (448)	
Pit S Grou	tability:	See Ge	eneral Remarks age at 0.30m		-4	Surface Elevation 36.5	onLevel: 8 mAOD
	of Trial		B 0.7	General Remarks: Terminated at 2.10m bgl due to collapse sides.	e of pit	All dimens Log Scale	ions in metres

Trial Pit No. Client: Kier Living Project Title: Salhouse Road, Sprowston TP25 Project No: BRD3227 Logged By: A Leon Date Completed: 01/05/2018 Sheet 1 of 1 Method Used: 180° Backhoe excavator (JCB 3CX type) Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No Value TOPSOIL: Soft, dark brown, gravelly, silty clay with roots. Gravel of fine to medium, subrounded flint. 0.10 11 24 34 34 0.30 (36.27) Soft, orange, clayey SILT. B1 J2 0,60 0.70 (35.87) Medium dense to very dense, wet, orange, sandy GRAVEL. Gravel of fine to medium, subangular to rounded flint. Occasional large boulders. SHERINGHAM CLIFFS FORMATION 0.70 - 0.80 m: Medium dense, orangey brown, gravelly SAND. 1.90 62 2.50 (34.07) Surface Elevation Level: Pit Stability: See General Remarks Groundwater: Seepage at 0.50m 36.57 mAOD All dimensions in metres Log Scale 1:25 Plan of Trial Pit: General Remarks: Running sands. Terminated at 2.50m bgl due to collapse of pit 2.0 B 0.7 Telephone: 01295 272244 Email: info@brduk.com

Trial Pit No. Client: Kier Living Project Title: Salhouse Road, Sprowston **TP26** Project No: BRD3227 Logged By: A Leon Date Completed: 01/05/2018 Sheet 1 of 1 Method Used: 180° Backhoe excavator (JCB 3CX type) Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No Value TOPSOIL: Soft, dark brown, gravelly, silty clay with roots. Gravel of fine to medium, subrounded flint 34 34 34. 0.20 J1 0.30 (36.55) Soft, wet, orange, sandy, clayey SiLT. J2 B1 (36.25) Medium dense to dense, wet, brown to orange, slightly silty, sandy GRAVEL. Gravel of fine to medium, subangular to rounded filnt. SHERINGHAM CLIFFS FORMATION 0.90 (35,95) Medium dense, wet, reddish brown, slightly silty, gravelly SAND. 1.20 B2 1.30 (35.55) Medium dense to dense, wet, orange brown, very sandy GRAVEL. Gravel of fine to coarse, occasional cobbles. 2.00 m: Occasional red-oxidised sand deposits 2.30 B3 Pit Stability: See General Remarks Groundwater: Seepage at 1.30m Surface Elevation Level: 36.85 mAOD All dimensions in metres Log Scale 1:25 Plan of Trial Pit: General Remarks: Running sands. Terminated at 2.40m bgl due to collapse of pit 2.0 B 0.7 D C Telephone: 01295 272244 Email: info@brduk.com

Trial Pit No. Client: Kier Living Project Title: Salhouse Road, Sprowston TP27 Project No: BRD3227 Logged By: A Leon Date Completed: 01/05/2018 Sheet 1 of 1 Method Used: 180° Backhoe excavator (JCB 3CX type) Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No Value TOPSOIL: Soft, dark brown, gravelly, silty clay with roots. Gravel of fine to medium, subrounded flint. 34 34 34 0.25 J1 0.30 (36.55) Soft, orange, clayey SILT. 0.60 J2 B1 Medium dense to dense, wet, orange, slightly silty, sandy GRAVEL. Gravel of fine to medium. SHERINGHAM CLIFFS FORMATION 1.40 B2 1.50 m: Becomes reddish brown in colour 2.80 **B3** Surface Elevation Level: Pit Stability: See General Remarks Groundwater: Seepage at 1.50m and 2.20m 36.85 mAOD General Remarks: Running sands and slight spalling on All dimensions in metres Log Scale 1:25 Plan of Trial Pit: encountering groundwater. Terminated at 2.90m bgl. 2.0 B 0.7 D C Telephone: 01295 272244 Email: info@brduk.com

Proje Logg	ect Title: ect No: jed By:	S B A	ier Living alhouse Road, S RD3227 Leon 1/05/2018	Sprowston		7		Pit No.
	od Used			cavator (JCB 3CX type)		, k	Shee	t 1 of 1
_	amples & T			Description of Strata	Dep (Le		Geology	Legend
Depth 0.20	Type & No.	Value	TOPSOIL: Soft, da to medium, subrou	ark brown, gravelly, silty clay with roots. Gravel of fine unded flint.			TS	<u> </u>
			Soft, orangey brow	vn, some natural black stained, clayey SiLT with avel.	-	30 (5.72)		X X X X X X X X X X X X X X X X X X X
0.70	J2	Med SAN	Medium dense, we SAND.	et, orange brown and light grey, gravelly, clayey, fine	(3 - - 1	50 (5.52)	SHERINGHAM CF	x x x x x x x x x x x x x x x x x x x
1.10	.10 B1		1,20 m; Ceramic la	and drain.	11:	40 4.62)	SHE	x
					3	80-	oce Elevatio	
Pit S Grou	tability: ndwater	Slight s : Seep	palling of sides age at 0.50m			Suna		mAOD
<b>Plan</b>	of Trial	Pit: - 2.0 — A	→ B 0,6	General Remarks: Terminated at 1.20m bgl due to heavy in from land drain.	nflow		Scale	ons in metre 1:25 BRD

Proje Logg Date	nt: ect Title: ect No: jed By: Complet od Used	S B A ed: 0	ier Living alhouse Road, \$ RD3227 . Leon 4/05/2018 80° Backhoe ex	Sprowston cavator (JCB 3CX type)			TF	Pit No. P29 : 1 of 1
Sa Depth	Type & No	ests Value		Description of Strata	De (Le	pth /	Geology	Legend
реры	Type & No.	Value	TOPSOIL; Grass	over: Dark brown, sandy silt.			S1	0
			Medium dense, w SAND with light g subrounded flint.	et, orange and light gray, clayey, slight gravelly, fine rey sandy clay pockets. Gravel of fine to medium,		).40 35.18) (.20 34.38)	SHERINGHAM CF	
					3			
Di+ C	tabilitu	Conor	ally stable throug	bout	4	Surf	ace Elevation	Level:
Grou	indwater	: Not e	ncountered	mour		550		mAOD
<b>Plan</b> D	of Trial I	7it: - 1.8 — - A	B 0.7	General Remarks: Terminated at 1,20m bgl to undertake soakage test.		Log	g Scale 1	BRD 01295 272244

Proje Logg Date	nt: ect Title: ect No: ged By: Complet lod Used	S B A ted: 0	iier Living salhouse Road, S RD3227 Leon 4/05/2018		Į		TF	Pit No.  P30 t 1 of 1
A. 11.	amples & T		во-васклое ех	cavator (JCB 3CX type)		10.1	Unico	
Depth	Type & No	Value		Description of Strata		pth / vel)	Geology	Legend
			MADE GROUND, bricks and flint gro	TOPSOIL: Grass over; Soft, silty clay with occasional avel.		i.50 35,33)	MG/TS	
			Medium dense, w SAND,	et, orange and light grey, gravelly, slightly clayey	2.7.4	35,33)	ATION	o o
			Medium dense, w to coarse, subrou	et, orange, slightly slity, sandy GRAVEL. Gravel of fine nded flint.	1 (5	.90 34.93)	SHERINGHAM CLIFFS FORMATION	
					3			
Pit S	tability:	Genera	ally stable throug age at 0.50m	hout		Surfa	ice Elevatio	n Level: 3 mAOD
	of Trial I		age at 0.50m	General Remarks: Terminated at 2.00m bgl.		All		ions in metres

Client: Project T Project N Logged E Date Con	itle: Side:	Ger Living Salhouse Road, S BRD3227 Leon 4/05/2018				TF	Pit No.  P31 t 1 of 1
Method L	s & Tests	80° Backhoe ex	cavator (JCB 3CX type)		100	Jilee	. 1011
Depth Type			Description of Strata	De (Le	pth / evel)	Geology	Legend
			over: Dark brown, clayey silt.		0.40 35.31) 0.80 34.91)	SCF TS	
Pit Stabil Groundw Plan of T	rater: Seep	ally stable throughage at 0.80m	ghout  General Remarks:  Trial pit abandoned at 0.80m gbl du extremely soft soils at surface resul high risk to the excavator of sinking	ting in a	All		1 mAOD ions in metre

Proje Logg	ect Title: ect No: jed By:	S B A	ier Living alhouse Road, Sprowston RD3227 Leon			P32
	Completed		4/05/2018 80° Backhoe excavator (JCB 3CX type)		Shee	et 1 of 1
-	amples & T		Description of Strata	Der (Le	oth / vel) Geolog	y Legend
Depth	Type & No	Value	TOPSOIL: Grass over: Dark brown, clayey silt.		र्घ	56 36 36 36 56 36 30 56 56 36 36 56
			Soft, brown, gravelly SiLT.		40 (6.08) 60 LL	× × × × ×
			Medium dense, wet, orange, slightly silty, sandy GRAVEL.		85 (5.69)	"One One One One One One One One One One
				4		
Pit S Grou	tability: ındwater	General	ally stable throughout ncountered		Surface Elevati 36.4	on Level: 8 mAOD
<b>Plan</b> D	of Trial	Pit:	General Remarks: Terminated at 0.85m bgl to undert soakage test.  B 0.7	ake shallow	All dimens Log Scale	sions in metre

Client: Project 1 Project 1 Logged	No: By:	S B A	ier Living alhouse Road, Sprowston RD3227 Leon		To		Pit No.
Date Cor Method			4/05/2018 80° Backhoe excavator (JCB 3CX type)			Shee	t 1 of 1
	es & Test	S /alue	Description of Strata	Dep (Le		Geology	Legend
Debut Type	5 0 140	dius	TOPSOIL; Grass over: clayey silt with roots and occasional gravel.		40	TS	5 46 46 46 4 6 46 46 46 46 4
			Dense to very dense, well orange brown with some light grey, slightly silty, sandy GRAVEL to COBBLES of fine to coarse, subrounded filint.	1 2 2	(5.87) (1.00) (1.4.27)	SHERINGHAM GLIFFS FORMATION	"0, = 80, = 0, = 0, = 0, = 0, = 0, = 0, =
Pit Stahi	litur Sc	an Ge	eneral Remarks	-4	Surface	e Elevatio	n Level:
			ncountered		1		7 mAOD
Plan of 1	2	.0 —	General Remarks: Terminated at 2.00m bgl due to collaps sides.  B 0.7	e of pit	Log :	Scale	BRD 01295 272244

Proje Logg Date	ect Title: ect No: jed By: Complet	S B A ted: 0	ier Living alhouse Road, Sprowston RD3227 Leon 4/05/2018	Ī	74	TF	Pit No.
8	od Used		80° Backhoe excavator (JCB 3CX type)			Shee	t 1 of 1
Sa Depth	Type & No	ests Value	Description of Strata	Dep (Le		Geology	Legend
			TOPSOIL: Grass over: silty day with roots. Occasional flint gravel.  Medium dense, wet, orange brown and light grey, slightly silty, sandy GRAVEL. Gravel of fine to coarse, subangular to rounded flint.		40 613) 70 5.83)	SCF TS	1 34 34 34 34 34 34 34 34 34 34 34 34 34
				3			
Dit S	tability	Gonors	lly stable throughout	4	Surfa	sce Elevatio	ın Level:
Grou	ndwater	: Not e	ncountered		33.16		3 mAOD
<b>Plan</b> D	of Trial I	Pit:  - 1.8 — A C	General Remarks: Terminated at 0.70m bgl to undertake s soakage test.  B 0.7	hallow	Log	Scale	BRD 01295 272244 gbrduk.com

	Complet od Used		4/05/2018 80° Backhoe exc	cavator (JCB 3CX type)		16	Shee	t 1 of 1
Sa	imples & T	ests		Description of Strata	Dep	oth /	Geology	Legend
epth	Type & No	Value	TODAOULO		(Le	vel)	Caorogy	26 46 46 4
			coarse gravel.	over: Dark brown, clayey silt with roots, Occasional	-		22	1. 44. 37. 34
			Coff that house a	slightly gravelly SILT, Gravel of fine to medium,	0.3	30 6.22)		No X ox
			subangular flint.	slightly gravelly SILT, Gravel of fine to medium,	-		SCF	× x x × 9x
			Medium dense, we of fine to coarse, s	et, orange brown, slightly silty, sandy GRAVEL. Gravel subrounded flint.		50 6.02) 65 5.87)	o,	0 x0 0 x0 0 x
							1	1 - 1
					ī			
					=			
					-			
					ė.			
					Ė			
					3			
					4			
t S	tability:	Genera Not e	llly stable throug ncountered	hout		Surfa	36.52	nLevel: 2 mAOD
100	of Trial F	Pit:		General Remarks: Terminated at 0.65m bgl to undertake sh soakage test.	allow	All	dimensi Scale	ions in metr 1:25
-	<del> &lt;</del> 1.7 <del>&gt;</del>			Soundge toot.				
-							1	DDD
-	•	A	, A					
-			₩ B 0.7			1		BRD
an			B 0,7		j	(	1	BKU

Logged By: Date Compl Method Use	eted: 0	. Leon 4/05/2018 80° Backhoe exc	cavator (JCB 3CX type)		1	Shee	t 1 of 1
Samples &			Description of Strata	Dep	oth /	Geology	Legend
Depth Type & N	Value	TOPSOIL: Grass of gravel of flint.	over: Dark brown clayey silt with roots. Occasional	(Le	vei)	ST	<u> </u>
		Soft, wet, brown, s subangular flint.	slightly gravelly SILT. Gravel of fine to medium,	0(3	3D 6.41)	SHERINGHAM CF	**************************************
		Medium dense, w	et, orange, slightly silty, sandy GRAVEL.	1 (3	90 (5.81) (00 (5.71)	ਲ	2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x
				3			

Logged B Date Com Method U	plet	ed: 04	Leon 1/05/2018 30° Backhoe excavator (JCB 3CX type)		Shee	P37
Samples			Description of Strata	Depth / (Level)	Geology	Legend
Depth Type (	No	Value	TOPSOIL: Grass over: Dark brown, clayey silt with roots	(ECVEI)		91 41 41 41 41
11				_	2	6 34 38 36.
			Soft, brown, SILT with occasional fine to medium, angular flint.	0.3D (36.45)		X X X
				$\vdash$		× × × × ×
			Dense to very dense, wet, orange brown to reddish brown, slightly silty, sandy GRAVEL to COBBLES. Gravel to cobbles of fine to coarse, subrounded flint.	280 (33.95)	SHERINGHAM CLIFFS FORMATION	** * * * * * * * * * * * * * * * * * *
Pit Stabili Groundw Plan of Tr	ater:	Slight	palling of sides seepage at 1.30m  General Remarks: Running sands. Terminated at 2.80m bgl.	AI	40,000	5 mAOD ions in metre

Proje Logg	ect Title: ect No: jed By:	S B A	ier Living alhouse Road, Sprowston RD3227 Leon			P38
	Completed od Used		4/05/2018 80° Backhoe excavator (JCB 3CX type)		Shee	et 1 of 1
Sa Depth	Type & No	ests Value	Description of Strata	Depth (Level)		Legend
оери	Type & No	Agide	MADE GROUND/TOPSOIL; Grass over; Dark brown, slightly gravelly, clay silt with roots and occasional brick fragments. Concrete slab (large fragment).  Soft, brown, clayey SILT with roots.	0.40	MG	X=X=X-
			Medium dense to dense, orange, slightly silty, sandy GRAVEL, Gravel of fine to medium, subrounded flint.	0.80	SCF	× × × × × × × × × × × × × × × × × × ×
				2		
			illy stable throughout ncountered	s	urface Elevati 36.5	onLevel: 1 mAOD
<b>Plan</b>	of Trial I	Pit: - 3,0 — A	General Remarks: Terminated at 1.10m bgl.  B 0.7	L	ll dimens og Scale	ions in metre

Proje Logg	ect Title: ect No: ged By:	S B A	ier Living alhouse Road, S RD3227 Leon	prowston		10		Pit No.
	Completed		4/05/2018 80° Backhoe exc	avator (JCB 3CX type)		N	Shee	t 1 of 1
	amples & T			Description of Strata	Dep (Lev		Geology	Legend
Depth	Type & No.	Value	TOPSOIL: Grass of	over: Dark brown, clayey silt with roots.			TS	<u> </u>
			Gravel of fine to co	se, wet, orange brown, slightly sitty, sandy GRAVEL. varse, subrounded flint. o boulders below 1.50m.	0.75 (31)	55 8.24) 70 5.89)	SHERINGHAM CLIFES FORMATION	
Grou	tability: Indwater of Trial	: Seep Pit:	spalling of sides age at 2.30m	General Remarks: Terminated at 2.40m bgl.	4	All o		mAOD ons in metre:
D		A C	B 0.7			Tele Ema	ephone:	BRD 01295 272244 0brduk.com

Date	jed By: Complet od Used	ed: 0	: Marina 6/06/2018 80° Backhoe excavator (JCB 3CX type)		Shee	t 1 of 1
Sa Depth	Type & No	ests Value	Description of Strata	Depth (Level)	Geology	Legend
			TOPSOIL: Grass over: Dark brown clayey silt with rootlets. Occasional gravel fine to medium, subangular to subrounded of flint.  Firm, orange, light brown, grey, sandy clayey SiLT, Occasional gravel of fine to medium, subangular to subrounded flint.  Medium dense, orange, light grey, slightly silty, clayey, gravelly SAND. Gravel of fine to medium, subangular to subrounded flint.  1.10 - 1.50 m: pockets of light grey, sandy CLAY.  Medium dense, orange brown, silty, very sandy GRAVEL. Gravel of fine to coarse, subangular to subrounded flint.	0.30 (35.37 0.70 (34.97	SHERINGHAM CLIFES FORMATION	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Dit C	4-LIP4	00	Us adable descriptorial	4	urface Elevatio	on level
			illy stable throughout ncountered			7 mAOD
<b>Plan</b> D	of Trial I	7 1.8 — A C	General Remarks: Terminated at 2.50m bgl.  B 0.6	L	og Scale	BRD 01295 272244

Proje Logo	nt: ect Title: ect No: ged By: Comple	S B R	iier Living salhouse Road, S RD3227 Marina	Sprowston			P41
	od Used		6/06/2018 80° Backhoe exc	cavator (JCB 3CX type)		Shee	et 1 of 1
-	amples &			Description of Strata	Depth (Level		Legend
Depth	Type & No	Value	TOPSOIL: Grass of gravel fine to med fragments.	over: Dark brown clayey silt with rootlets. Occasional ium, subangular to subrounded of flint. Rae brick		ST.	<u> </u>
			Grayel of fine to m	ange, light grey, slightly silty, clayey, gravelly SAND. nedium, subangular to subrounded flint. kets of light grey, sandy CLAY.	0.35		
			Medium dense, or to coarse, subang	ange brown, silty, very sandy GRAVEL. Gravel of fine ular to subrounded flint	1.30 (34.32)	SHERINGHAM CLIF	
					3		
Pit S Grou	tability: ındwate	See Ge	eneral Remarks age at 1.30m		4	urface Elevati 35.6	on Level: 2 mAOD
5.0	of Trial		B 0.6	General Remarks: Running sands. Terminated at 2.50m bgl.	<u>L</u>	Il dimens og Scale	ions in metres

Client: Kier Living
Project Title: Salhouse Ro
Project No: BRD3227
Logged By: A Leon
Date Commenced: 02/05/2018
Date Completed: 02/05/2018
Method Used: Windowless Kier Living Salhouse Road, Sprowston BRD3227 Borehole No. **WS01** Sheet 1 of 2 Windowless Percussive Sampling Rig

Sa	amples & T	ests	Water	Description of Strata	Depth /	Legend	Geology	Installatio
Depth	Type & No	Value	×	Description of Strate	(Level)	Legenu	GCOlogy	/Backfil
0.30	J1			TOPSOIL: Grass over, Soft, light brown, slightly gravelly, sandy silt. Gravel of fine to medium, angular to rounded flint.	0.35	10 10 10 1 34 36 36 3 84 30 50	TS	
				Medium dense, orange, gravelly, clayey SAND. Gravel of fine to medium, subangular to rounded flint.	(36,14)	xo xo xo x x x x x x x x x x x x x x x	, ,	
0,70	J2				_	× e×	4	
0.90	D1				-	xo xo . X	1	
1.00	SPT	15 N		1.00 m: SPT: 3;3/3;3,5,4	#.D	× ° × ° × ° × ° × ° × ° × ° × ° × ° × °		
			*		1.50	жо жа	, ,	
				Medium dense, saturated, grey, gravelly SAND. Gravel of fine to medium, subangular to rounded flint.	(34.99)	o . o	c	
	100		¥			a	Z	
2.00	SPT	8 N	¥	Loose, saturated, grey and some orange, slightly gravelly, fine SAND. Gravel of fine to medium, rare coarse, subangular to rounded fifnt. 2.00 m: SPT: 1,1/2,2,2;2	2.0 2.00 (34.49)	8 0	FORMATIO	
2.50	D2			2.00 - 2.20 m: Brown, saturated, slightly gravelly, fine to coarse SAND, 2.30 - 2.50 m; Clayey, fine SAND.		ж в ж ж ж ж х к х х	SHERINGHAM CLIFFS FORMATION	
					2.90	ο × . ο . × ×	IERING	
3.00 3.00	SPT B1	22 N		Medium dense, saturated, brown, slightly gravelly, fine to coarse SAND.  3.00 m: SPT: 2,2/4,6,6,6	3.0 (33.59)		SH	
					-			
					-			
1,00	SPT	17 N		Firm, reddish brown, slightly gravelly, silty CLAY. Gravel of fine to medium, rounded flint.	4.0 4.00 (32.49) 4.10 (32.39)	× * × × × ×		
				4.00 m: SPT: 8,7/7,3,3,4		x a x	-	
				Medium dense, saturated, brown, slightly silty, slightly gravelly SAND. Gravel of fine to medium, subrounded flint.	4.50	o × o		宏宏

#### General Remarks:

Borehole terminated at 5,50m bgl.
Installed with 50mm standpipe, gas tap and flush metal cover. Borehole cased from 2.50 to 5.00m bgl.

Surface Elevation Level:

36.49 mAOD

All dimensions in metres Log Scale 1:25



Client: Project Title: Project No: Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 **WS01** Logged By: A Leon Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 2 of 2 Windowless Percussive Sampling Rig Method Used: Samples & Tests Depth / (Level) Description of Strata Depth Type & No. Value Continued from 4.10m: Medium dense, saturated, brown, slightly silty, slightly gravelly SAND, Gravel of fine to medium, subrounded flint. SPT D3 10 N Firm, brown, clayey SILT. 5.00 m: SPT: 4,3/2,3,3,2 5.40 (31.09) 5.50 (30.99) Medium dense, saturated, brown, silty, gravelly SAND. Gravel of fine to coarse, subangular to rounded flint. 6.0 8.0 Surface Elevation Level: General Remarks:

Borehole terminated at 5,50m bgl.
Installed with 50mm standpipe, gas tap and flush metal

cover. Borehole cased from 2.50 to 5.00m bgl.

36.49 mAOD

All dimensions in metres Log Scale 1:25



Client: Kier Living Borehole No.
Project Title: Salhouse Road, Sprowston
Project No: BRD3227
Logged By: A Leon
Date Commenced: 02/05/2018
Date Completed: 02/05/2018
Method Used: Windowless Percussive Sampling Rig

Sa	amples & T	ests	Water	Description of Strata	Depth / (Level)	Legend	Geology	Installation /Backfill
Depth	Type & No	Value	Wa	0.0012.01.001	(Level)		Geology	/Backfill
0.20	J1			TOPSOIL: Grass over: Dark brown, sifty clay with mots.	0.30 (35.88)	1. 24. 36. 36 1. 24. 36. 36 20. 30. 30.	TS	
0,60	J2			Loose, orange brown and light grey, slightly gravelly, clayey, fine SAND with pockets of firm, light grey, sandy CLAY.	(35.88)	o o		
			1		-	o , -o	ATION	
0.90 1.00	D1 SPT	5 N	ŀ	1.00 m: SPT: 1,1/1,1,2,1	#.Ö	- a	SHERINGHAM CLIFFS FORMATION	
1.50	D2					_a	HAM CLI	
1.50	DE			1.50 m: Firm, grey, clay pocket. 1.70 m: Firm, grey, gravelly, sandy clay pocket.	Ē	_ a o	LERING	
2.00	SPT(C)	50 N			2.0 2.00 (34.18)	o . o	\$	
_,00	G. 1(0)	5011		Very dense, orange brown, silty, sandy GRAVEL (assumed). 2.00 m: SPT: 11,14/50 for 20mm	2.20 (63.93)	000000		
					Ė			
					3.0			
					=			
					4.0			
					-			
								- A

#### General Remarks:

Borehole terminated at 2.20m bgl due to refusal.
Dynamic probbing from 2.20m to 2.80m bgl (refuse).

Surface Elevation Level:

36.18 mAOD

All dimensions in metres Log Scale 1:25



Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: Project No: **WS03** Logged By: A Leon Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Windowless Percussive Sampling Rig Method Used: Samples & Tests Depth / (Level) Installation /Backfill Description of Strata Legend Depth Type & No Value TOPSOIL: Grass over: wet, dark brown, silty clay with roots. 44 dy 3 2 Medium dense, slightly silty, sandy GRAVEL. Gravel of fine to coarse, subangular to rounded flint. D.60 (36.D3) Medium dense to very dense, orange brown, some grey, gravelly SAND. Gravel of fine to coarse, subrounded to rounded flint, 1 SHERINGHAM CLIFFS FORMATION 0.60 - 1.00 m: Slightly silty. 1.00 SPT 21 N 1.00 m: SPT: 4,5/4,4,4,9 2.0 SPT 2.00 50 N 2.00 m; SPT; 2,2/8,14,16,12 for 65mm 2:45 (34.18) 4.0 Surface Elevation Level: General Remarks: Borehole terminated at 2.45m bgl due to refusal.

Dynamic probbing from 2.40m to 4.60m bgl (refuse). 36.63 mAOD BRD All dimensions in metres Log Scale 1:25 Telephone: 01295 272244 Email: info@brduk.com

Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: **WS04** Project No: Logged By: A Leon Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Method Used: Windowless Percussive Sampling Rig Samples & Tests Depth / (Level) Installation /Backfill Description of Strata Legend Geology Depth Type & No Value TOPSOIL: Grass over: wet, dark brown, silty clay with roots. No 18 1 2 0.30 J1 Soft ,orange and dark brown, slightly gravelly SILT. Oxe XO XO Medium dense to very dense, brown, saturated, slightly silty, sandy GRAVEL. Gravel of fine to medium, rounded flint. SHERINGHAM CLIFFS FORMATION 0.90 J2 1.00 SPT 15 N 1.00 m: SPT: 2,2/3,3,4,5 Medium dense to very dense, reddish brown and orange, silty, gravelly SAND, Gravel of fine to coarse, subangular to rounded flint. 1.50 D1 1.90 m: Coarse gravel and shattered flint in SPT. 2.0 SPT 2.00 50 N 2.00 2.00 m; SPT; 6,6/12,18,14,6 for 15mm 2.40 (34.21) 4.0 Surface Elevation Level: General Remarks: Borehole terminated at 2.40m bgl due to refusal.

Dynamic probbing from 2.40m to 5.00m bgl.

Installed with 50mm standpipe, gas tap and flush metal 36.61 mAOD BRD All dimensions in metres Log Scale 1:25

Telephone: 01295 272244 Email: info@brduk.com

cover.

Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: **WS05** Project No: Logged By: A Leon Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Windowless Percussive Sampling Rig Method Used: Samples & Tests Depth / (Level) Description of Strata Depth Type & No. Value TOPSOIL: Grass over: Dark brown, silty clay with roots. 241 July 3 Soft, wet, brown, clayey SILT. × × × 0.50 (36.22) Medium dense, orange brown and reddish brown, gravelly, fine SAND. Gravel of fine to coarse, subangular to rounded D.70 (36.02) Dense, brown, slightly silty, sandy GRAVEL. Gravel of fine to coarse, subangular to rounded flint. SHERINGHAM CLIFFS FORMATION 1.00 SPT 46 N 1.00 m: SPT: 8,11/11,12,11,12,12 1.00 m: Saturated. Dense, brown, slightly gravelly SAND Medium dense to dense, orangey brown, sandy GRAVEL. Gravel of fine to medium, subangular to rounded flint. 00 2.0 (34.72) 2.00 SPT 29 N Medium dense, orange brown, gravelly SAND. 2.00 m: SPT: 3,5/7,8,7,7,7 4.0 Surface Elevation Level: General Remarks: Borehole terminated at 2.50m bgl due to sampler got stuck.

Dynamic probbing from 0.00m to 5.00m bgl, 1m away from 36.72 mAOD the borehole.

All dimensions in metres Log Scale 1:25



Client: Kier Living
Project Title: Salhouse Ro
Project No: BRD3227
Logged By: BRD3227
Logged By: 02/05/2018
Pate Commenced: 02/05/2018 Kier Living Salhouse Road, Sprowston BRD3227 Borehole No. **WS06** 

Date Completed: 02/05/2018 Windowless Percussive Sampling Rig Method Used:

Sheet 1 of 1

Sa	amples & T	ests	te le	Description of Physic	Depth /	1	G1	Installation
Depth	Type & No	Value	Water	Description of Strata	(Level)	Legend	Geology	/Backfill
0.10	J1			TOPSOIL: Grass over: Brown, silty with roots and occasional fine to medium, angular gravel of flint.	0.26	(1) 24 (1) 25 (2) 21 (2) 24 (2) 25 (2) 21	TS	
0.50	PEN	1.0x3		Soft, brown, clayey SILT with occasional fine to medium subangular gravel of flint.	0.25 (35.93)	× × × × × × × × × × × × × × ×		
0.50 0.60	J2 D1	kg/cm²		Medium dense, orange and light grey, slightly gravelly, clayey, fine SAND with sandy clay layers. Gravel of fine to	D.65 (35.53)	~ × × ×		
0.90	D2			medium, subangular to rounded flint.	-	o , o		
1.00	SPT	19 N	+	0.90 m: Clay, sandy layer.  Medium dense, wet, orange, brown, slightly gravelly, clayey, fine SAND. Gravel of fine to medium, subangular to rounded	1.0 1.00 (35.18)	жо жо «		
			¥	flint. 1.00 m; SPT; 2,3/4,5,5,5	-	ν		
						xo xo x x	į.	
1.80	D3				8	6 × , 0 × , x	z	
2.00 2.00	SPT B1	35 N	<b>1</b>	Dense, light brown, sandy GRAVEL. Gravel of fine to coarse, subangular to rounded flint. 2.00 m: SPT: 12,10/9.9.8.9	2.0 (34.23)	000000	-	
2.40	В3					000000	ZUFFSF	
	L				6	00000	GHAM (	
2.80	B2				E .	00000	1	
2.90	SPT	44 N		2.90 m: SPT: 6,9/12,12,10,10	3.0	000000	돐	
						000000		
					_	00000		
3.90	SPT	37 N				00000		
	240. 1	300		Dense, saturated, gravelly SAND. 3.90 m: SPT: 2,9/7,8,9,13.	4.0 (32.28)	o o		
					4.50	ο ο		

#### General Remarks:

General Remarks:

Borehole terminated at 4.50m bgl due to refusal of the liner.

Subsequent borehole collapsed.

Installed with 50mm standpipe, gas tap and flush metal cover.

Borehole cased to 2.90m bgl due to refusal.

Surface Elevation Level:

36.18 mAOD

All dimensions in metres Log Scale 1:25



Client: Kier Living
Project Title: Salhouse Ro
Project No: BRD3227
Logged By: A Leon
Date Commenced: 02/05/2018
Date Completed: 02/05/2018
Method Used: Windowless Kier Living Salhouse Road, Sprowston BRD3227 Borehole No. **WS07** Sheet 1 of 1 Windowless Percussive Sampling Rig

Sa	amples & T	ests	Water	Description of Strata	Depth /	Legend	Geology	Installatio /Backfill
Depth	Type & No	Value	W	GENTE OFFICE	(Level)		Scology	/Backfill
0.20	Ji			TOPSOIL: Grass over. Clayey silt with roots and occasional fine to medium, subangular flint gravel.	0.30	10 10 10 10 10 20 10 10 10 10 10 10	7	
	3-1			Soft, wet, brown with dark brown, slightly gravelly, clayey SILT. Gravel of fine to medium, subangular flint.	0.30 (36,30) 0.45 (36,15)	× × × ×		
0,50	J2			Dense to very dense, orange brown and reddish brown, silty, gravelly SAND. Gravel of fine to coarse, subangular to rounded flint and ironstone.	(36.75)	x6	27 S	
1.00	SPT	35 N		1.00 m: SPT: 5,6/7,9,9,10	-	X 0 X 0 X 0 X 0 X 0 X 0 X 0 X 0 X 0 X 0	SHERINGHAM CLIFFS FORMATION	
2,00	SPT	33 N	Ŧ	2,00 m; SPT; 8,5/7,6,9,11	2.0	0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 × 0 ×	SHERINGHAM	
2.80	SPT	50 N		2.80 m; SPT: 12,11/15,15,16,4/20mm	3.0 5.20 (33.40)	ж ж о ж о ж ж ж ж ж ж	**	
					4.0			

General Remarks: Borehole terminated at 3.20m bgl due to refusal.

Surface Elevation Level: 36.60 mAOD

All dimensions in metres Log Scale 1:25



Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: **WS08** Project No: Logged By: A Leon Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Method Used: Windowless Percussive Sampling Rig Samples & Tests Depth / (Level) Installation /Backfill Description of Strata Legend Geology Depth Type & No. Value MADE GROUND/TOPSOIL: Grass over: Dark brown, slightly gravelly, clayey silt with charcoal fragments and roots. Gravel of fine to medium, angular flint. MG/TS 0.20 Soft, wet, orange brown, slightly gravelly, clayey SILT. Gravel of fine to medium, subangular flint. 0.70 J2 SHERINGHAM CLIFFS FORMATION Dense to very dense, saturated, orange brown, slightly siltly, gravelly SAND. Gravel of fine to coarse, subangular to rounded filint.

1.00 m: SPT: 0,0/5,6,9,12-1.00 SPT 32 N SPT 1.30 40 N 1.30 m; SPT: 7,8/13,10,10,10 1.30 - 2,00 m; Liner saturated. 'cox × 2.0 SPT 2.00 50 N 2.00 m; SPT; 25 for 65mm/27,23 for 70mm o × 0 2.20 (33.88) 4.0 General Remarks: Surface Elevation Level: Borehole terminated at 2.20m bgl due to refusal.
Installed with 50mm standpipe, gas tap and flush metal 36.08 mAOD BRD cover. Borehole cased to 1.30m due to refusal. All dimensions in metres Log Scale 1:25 Telephone: 01295 272244 Email: info@brduk.com

Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: **WS09** Project No: Logged By: A Leon Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Windowless Percussive Sampling Rig Method Used: Samples & Tests Depth / (Level) Description of Strata Legend Geology Value Depth Type & No. MADE GROUND/TOPSOIL: Grass over: Dark brown, silty clay with roots. Occasional flint gravel and brick fragments. MG/TS 0.30 J1 Soft, wet, brown, clayey SILT with roots. 1.0x3 kg/cm² 0.50 0.50 0.60 D1 PEN J2 SHERINGHAM CLIFFS FORMATION D.80 (35.89) Dense to very dense, saturated, reddish brown, silty, sandy GRAVEL. Gravel of fine to coarse, subangular to rounded flint and occasional ironstone. 1.00 m; SPT: 5,6/7,10,9,12 1.00 = 1.80 m; Liner saturated. 1.0 1.00 SPT 38 N 1.80 SPT 50 N 1.80 m: SPT: 20,5 for 30mm/16,21,13 for 35mm 2.0 0 00 0 4.0 General Remarks: Surface Elevation Level: Borehole terminated at 2.10m bgl. 36.69 mAOD BRD All dimensions in metres Log Scale 1:25 Telephone: 01295 272244 Email: info@brduk.com

Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: Project No: WS10 Logged By: R Marina Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Method Used: Windowless Percussive Sampling Rig Samples & Tests Depth / (Level) Description of Strata Legend Depth Type & No. Value MADE GROUND/TOPSOIL: Grass over dense brown, clayey silt. occasional subrounded to angular flint gravel and brick fragments. MG/TS 0.20 Ji Loose, orange and light grey, gravelly, clayey SAND. Gravel of fine to medium subrounded to subangular flint. 0,50 J2 SHERINGHAM CLIFFS FORMATION 1.00 SPT 9 N 1.00 m: SPT: 1.1/1,2,2,4 1.25 - 1.45 Firm, light grey and brown, sandy CLAY. 1.30 D1 1.40 PEN 5/2.0/1.5 kg/cm Very dense, light brown, slightly silty, sandy GRAVEL. Gravel of fine to coarse, subrounded to angular flint. 2.0 SPT 2.00 50 N 2.00 m: SPT: 13,12 for 65mm/21,17,12 for 45mm 4.0 Surface Elevation Level: General Remarks: Borehole terminated at 2.40m bgl due to refusal. Dynamic probing from 2.40 to 3.50m bgl (refuse). 35.84 mAOD BRD All dimensions in metres Log Scale 1:25

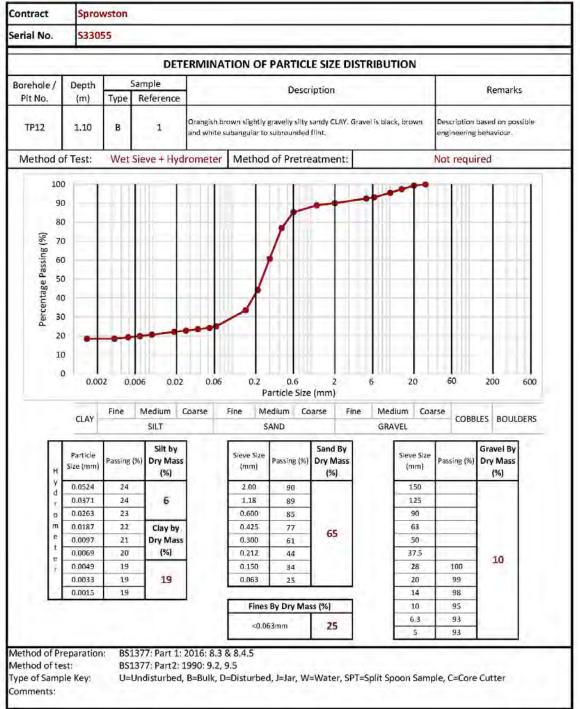
Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: **WS11** Project No: Logged By: R Marina Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Method Used: Windowless Percussive Sampling Rig Samples & Tests Depth / (Level) Installation /Backfill Description of Strata Legend Geology Depth Type & No. Value TOPSOIL: Grass over: Dark brown, clayey silt with roots. Occasional fine to medium, subangular to subrounded flint 0.10 J1 44 die 2 2 00,00,00 Medium dense, orange, beige, light brown, slightly silty, gravelly SAND. Gravel of fine to medium, subangular to subrounded flint and occasional ironstone. 0.40 J2 0 x 0 x 0 Medium dense, orange, light brown, silty, sandy GRAVEL.
Gravel of fine to coarse, subangular to subrounded flint. SHERINGHAM CLIFFS FORMATION 1.00 SPT 37 N 1.00 m: SPT: 10,8/8,8,10,11 1.50 SPT 50 N 1.50 m: SPT: 9,11/13,15,16,7/25mm 1.90 (34.21) 2.0 4.0 General Remarks: Surface Elevation Level: Borehole terminated at 1.90m bgl due to refusal. 36.11 mAOD BRD Installed with 50mm standpipe and gas tap. Dynamic probing from 1.90m to 4.00m bgl. All dimensions in metres Log Scale 1:25

Borehole No. Kier Living Salhouse Road, Sprowston BRD3227 Client: Project Title: Project No: **WS12** Logged By: R Marina Date Commenced: 02/05/2018 Date Completed: 02/05/2018 Sheet 1 of 1 Windowless Percussive Sampling Rig Method Used: Samples & Tests Depth / (Level) Installation /Backfill Description of Strata Legend Geology Depth Type & No. Value MADE GROUND/TOPSOIL: Grass over: Dark brown, clayey silt with roots. Occasional fine to medium, subangular to subrounded flint gravel and brick fragments. MG/TS 0.20 Medium dense, orange, light brown, greyish, sandy CLAY. Occasional natural black manganese deposits, 0,50 J2 D1 0.60 2.0/2.5/2.0 kg/cm² PEN 0,70 0.80 (34.90) Medium dense, orange, light brown, slightly silty, very sandy GRAVEL. Gravel of fine to coarse, subangular to subrounded flint. 1.00 m; SPT: 1,2/3,3,6,8 SHERINGHAM CLIFFS FORMATION 1.0 1.00 SPT 20 N 2.0 SPT 2.00 50 N 2.00 m; SPT; 10,12/13,15,15,7/30mm 4.0 Surface Elevation Level: General Remarks: beneral Remarks: Borehole terminated at 2.00m bgl. Installed with 50mm standpipe and gas tap. Dynamic probing from 2.00m to 2.50m bgl (refused). 35.70 mAOD BRD All dimensions in metres Log Scale 1:25 Telephone: 01295 272244 Email: info@brduk.com

Appendix B Particle Size Distribution (PSD) analysis.











	100									
erial No.	5330	55								
			DET	ERMINAT	ON OF	PARTICL	LE SIZE DIST	RIBUTION		
Borehole /	Depth	1	Sample			Descr	ription			Remarks
Pit No.	(m)	Туре	Reference			Desci	iption			T(C)TIG! N3
TP20	1.50	В	1	The second second	int GRAVE	L with occasion	, brown and whil onal yellowish w		ı.	
Method o	f Test:		Wet Siev	e	Method	of Pretre	eatment:		Not req	quired
Percentage Passing (%)	)									
30 20 10	0,00	2 Ö.	006 0.02 Medium (	0.06 Coarse Fi	- 10	0.6 article Size	2 e (mm) parse Fine	6 20	60 Coarse	200 6
20		0.50			ne M	article Size	e (mm)	1	Coarse	200 6
20	0,00	0.50	Medium (	Coarse Fi	ne M	article Size edium Co	parse Fine	Medium	Coarse CO	BBLES BOULDE
20	O.OCC	Fine	Medium (SILT Silt by Dry Mass	Coarse Fi	Pine Mine Sieve Size (mm) 2.00	article Size edium Co AND Passing (%)	e (mm)  parse Fine  Sand By  Dry Mass	Medium GRAVEL Sieve (mr	Coarse CO	BBLES BOULDE  Gravel By Dry Mass
20 10 0	O.OCC	Fine	Medium (SILT Silt by Dry Mass	Coarse Fi	Pine M Sieve Size (mm) 2.00 1.18	edium Co AND Passing (%) 47 43	e (mm)  parse Fine  Sand By  Dry Mass	Medium GRAVEL Sieve (mr	Coarse CO	BBLES BOULDE  Gravel By Dry Mass
20 10 0	O.OCC	Fine	Medium (SILT Silt by Dry Mass (%)	Coarse Fi	Pine M. Sieve Size (mm) 2.00 1.18 0.600	article Size edium Cd AND  Passing (%)  47  43  33	e (mm)  parse Fine  Sand By  Dry Mass	Medium GRAVEL Sieve (mr	Coarse CO	BBLES BOULDE  Gravel By Dry Mass
20 10 0	O.OCC	Fine	Medium (SILT Silt by Dry Mass (%) Clay by	Coarse Fi	P P M S Sieve Size (mm) 2.00 1.18 0.600 0.425	edium Co AND  Passing (%)  47  43  33  23	e (mm)  parse Fine  Sand By  Dry Mass	Medium GRAVEL Sieve (mr 15 12 90 63	Coarse CO	BBLES BOULDE  Gravel By Dry Mass
2(10 (10 (10 (10 (10 (10 (10 (10 (10 (10	O.OCC	Fine	Medium (SILT  Silt by Dry Mass (%)  Clay by Dry Mass	Coarse Fi	P P M S Sieve Size (mm) 2.00 1.18 0.600 0.425 0.300	Passing (%) 47 43 33 23 13	Sand By Dry Mass (%)	Medium GRAVEL Sieve (mr 15 12 90 63	Coarse CO	BBLES BOULDE  Gravel By Dry Mass (%)
2(10 (10 (10 (10 (10 (10 (10 (10 (10 (10	O.OCC	Fine	Medium (SILT Silt by Dry Mass (%) Clay by	Coarse Fi	Penne M Sieve Size (mm) 2.00 1.18 0.600 0.425 0.300 0.212	Passing (%) 47 43 33 23 13	Sand By Dry Mass (%)	Medium GRAVEL Sieve (mr 15 12 90 63 50	Coarse CO  Size Passing (  100  98  92  5 87	BBLES BOULDE  Gravel By Dry Mass
H y d r o m e t	O.OCC	Fine	Medium (SILT  Silt by Dry Mass (%)  Clay by Dry Mass	Coarse Fi	Penne M S Sieve Size (mm) 2.00 1.18 0.600 0.425 0.300 0.212 0.150	Passing (%) 47 43 33 23 13 9	Sand By Dry Mass (%)	Medium  GRAVEL  Sieve (mr  15  12  90  63  50  37. 28	Coarse CO  Size Passing (  100  98  92  5 87  79	BBLES BOULDE  Gravel By Dry Mass (%)
H y d r o m e t	O.OCC	Fine	Medium (SILT  Silt by Dry Mass (%)  Clay by Dry Mass	Coarse Fi	Penne M Sieve Size (mm) 2.00 1.18 0.600 0.425 0.300 0.212	Passing (%) 47 43 33 23 13	Sand By Dry Mass (%)	Sieve (mr 15 12 90 63 50 37. 28 20	Coarse CO  Size Passing (  100  98  92  5 87  79  74	BBLES BOULDE  Gravel By Dry Mass (%)
H y d r o m e t	O.OCC	Fine	Medium (SILT  Silt by Dry Mass (%)  Clay by Dry Mass	Coarse Fi	Pine M Sieve Size (mm) 2.00 1.18 0.600 0.425 0.300 0.212 0.150 0.063	Passing (%)  47  43  33  23  13  9  7  6	Sand By Dry Mass (%)	Sieve (mr 15 12 90 63 50 37. 28 20 14	Coarse CO  Size Passing (  100  98  92  5 87  79  74  67	BBLES BOULDE  Gravel By Dry Mass (%)
H y d r o m e t	O.OCC	Fine	Medium (SILT  Silt by Dry Mass (%)  Clay by Dry Mass	Coarse Fi	Pine M S Sieve Size (mm) 2.00 1.18 0.600 0.425 0.300 0.212 0.150 0.063 Fines	Passing (%) 47 43 33 23 13 9	Sand By Dry Mass (%)	Sieve (mr 15 12 90 63 50 37. 28 20	Coarse CO  Size Passing (  100  98  92  5 87  79  74  67  60	BBLES BOULDE  Gravel By Dry Mass (%)





