

Fontmell Close, St Albans, Hertfordshire, AL3 5HU

Ground Subsidence Investigation Report

On behalf of

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Contents

1	Introdu	uction	. 1
	1.1	Background	. 1
	1.2	The Site	. 1
	1.3	Historical Information	. 1
	1.4	Geology	. 2
	1.5	Hydrogeology	. 2
	1.6	Scope of Works	. 2
2	Groun	d Investigations Completed	. 4
	2.1	Geophysical Surveys	. 4
	2.2	Enabling Surveys	. 4
	2.3	Super Heavy Weight Dynamic Probes	. 4
	2.4	Window Sampler Boreholes	. 5
	2.5	Cable Percussion Boreholes	. 5
	2.6	Rotary Boreholes	. 5
	2.7	Level Monitoring	. 6
3	Groun	d Investigation Results	. 7
	3.1	Geophysical Survey Results	. 7
	3.2	Ground Investigation Results	. 7
	3.3	Existing Foundations	11
	3.4	Geotechnical Laboratory Testing	11
4	Interpr	etation of Ground Conditions	13
	4.1	Geological Sequence	13
	4.2	Ground Model	14
5	Remed	lial Measure Options	16
	5.1	Assessment of Stability	16
	5.2	Remedial Measures – Reinstatement	17
	5.3	Remedial Measures – Ground Improvement	18
	5.4	Remedial Measures – Ground Treatment (Full and Partial)	18
	5.5	Remedial Measures – Performance Risk Matrix	19
	5.6	Remedial Measures – Control of Surface Water Drainage	20
	5.7	Shallow Depressions Rear of 8 & 10 Fontmell Close	20
6	Summa	ary and Conclusions	21
	6.1	Background	21
	6.2	Current Situation	21
	6.3	Way Forward	21
7	Refere	nces	23



Figures

Figure 1:	Site Location Plan
Figure 2:	Site Layout Plan
Figure 3:	Geological Cross Section A-A'
Figure 4:	Geological Cross Section B-B'
Figure 5:	Schematic Interpretation of Ground Conditions
Figure 6:	Settlement Graph of Monitoring Points within Concrete Plug
Figure 7:	Settlement Graph of Monitoring Points within Concrete Plug (Log Scale)

Appendices

- Appendix 1: Topographical and Utilities Services Drawing
- Appendix 2: Exploratory Hole Records
- Appendix 3: Drilling Parameters Records
- Appendix 4: Trial Pit Sections
- Appendix 5: Laboratory Test Certificates



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1 Introduction

1.1 Background

- 1.1.1 Peter Brett Associates LLP (PBA) has been employed to investigate and assess the nature and cause of ground subsidence that has resulted in damage to the highway and adjacent private land at Fontmell Close, St Albans, Hertfordshire, AL3 5HU (see Location Plan Figure 1).
- 1.1.2 The services of PBA have been commissioned by a range of stakeholders impacted by the ground collapse that has occurred as follows:
 - Cunningham Lindsey loss adjusters acting on behalf of the insurer Legal and General for 10 Fontmell Close and 1 Bridle Close
 - Innovation Group Plc loss adjusters acting on behalf of the insurer Aviva for 8 Fontmell Close and Acromas for 9 Fontmell Close
 - Crawford & Company loss adjusters acting on behalf of the insurer Ageas for 11
 Fontmell Close
 - Hertfordshire County Council (HCC) in respect of the highway.

This report provides the results of the investigations completed below the highway and below adjacent private properties, which have been used to understand the ground conditions present in order to develop a ground model for the site and inform options for remedial measures.

- 1.1.3 A substantial ground collapse occurred in Fontmell Close on 1 October 2015. Following the collapse HCC and St Albans City & District Council (SACDC) coordinated infilling of the collapse with foamed concrete. HCC then commissioned a geophysical survey of the highway, completed by Geotechnology Ltd. Further geophysical surveys were later carried out by RSK, commissioned by GCG by agreement with the loss adjusters, encompassing adjacent private properties around the margins of the collapse.
- 1.1.4 Following a review of the geophysical survey results, PBA coordinated intrusive ground investigation works including the drilling of boreholes in areas interpreted by the geophysical survey to be of lower density ground than surrounding areas, possibly containing voids. These intrusive investigations were completed during December 2015 and January 2016.

1.2 The Site

1.2.1 The plan area of the ground collapse, centred on the highway, is approximately 130m² and is located between the fronts of numbers 8, 9 and 11 Fontmell Close, St Albans, Hertfordshire. The site of the collapse is approximately 1.5km to the north east of St Albans city centre (approximately TL 154 084). The immediate area is surrounded by further residential development. Numbers 8 and 10 Fontmell Close are two storey, semi-detached houses, number 1 Bridle Close is a two storey detached house, whilst numbers 9 and 11 Fontmell Close are single storey detached bungalows.

1.3 Historical Information

1.3.1 Based on a review of historical OS maps, the earliest available map dated 1878, shows that the site of the collapse and surrounding properties coincide with the location of a historical clay pit. A lime kiln and brick kiln are located on the south side of the pit. The land plot



containing the pit and kilns is marked as a Brick Field. The plan extent of the historical clay pit encompassed the land now occupied by the above referenced properties and extends over a wider area to the north, east, south and west. The 1898 map no longer shows the clay pits but marks the area as Old Clay Pits and the land where the clay pits were located is now marked as pasture. The early development of the houses around Fontmell Close in the wider area is shown on the maps from 1924, although outlines of the former pits can still be seen. By the 1973 map edition Fontmell Close and Bridle Close are shown much as they are currently.

- 1.3.2 Historical maps also show that further historical clay pits were present in the wider area surrounding Fontmell Close. The 1878 map shows further clay pits and kilns within a Brick Field a few hundred metres to the west. Three shafts are also marked indicating the presence of chalk mine workings.
- 1.3.3 As well as clay, chalk was an essential part of the brick, tile and pottery manufacturing process and the presence of chalk pits or chalk mine workings are commonly associated with the presence of clay pits (Edmonds, Green & Higginbottom 1990). Chalk was also required for the production of lime and the presence of lime kilns therefore can also indicate the presence of historical chalk workings. Copies of the referenced historical maps are contained within the geophysical survey report prepared by Geotechnology Ltd.

1.4 Geology

1.4.1 At the location of the site the published geological sequence (British Geological Survey Sheet 239: Hertford, 1978, 1: 50,000 scale and online resources at www.bgs.ac.uk) was indicated to comprise Quaternary age Kesgrave Catchment Subgroup – Sand & Gravel over Palaeogene age Lambeth Group deposits underlain by Cretaceous age Chalk Group strata (Lewes Nodular Chalk and Seaford Chalk Formations undifferentiated).

1.5 Hydrogeology

1.5.1 The published hydrogeology map (British Geological Survey, Hydrogeological Map of the area between Cambridge And Maidenhead, 1984, 1:100,000 scale) shows that the ground water level within the chalk aquifer lies between 70m OD and 80m OD (as recorded in 1976). Based on the topographical survey completed, ground level is recorded at around 122m OD. This indicates that the depth to ground water in the underlying chalk is at about 40m to 50m below the ground surface.

1.6 Scope of Works

1.6.1 The agreed scope of the ground investigation works undertaken by PBA comprised:

- Topographical and Utilities Surveys
- 3 vertically drilled cable percussion boreholes to obtain soil samples and to assess the ground conditions around the collapse in areas marginal to where anomalous ground conditions were inferred by the geophysical surveys
- 22 vertically and inclined drilled rotary open hole boreholes to assess ground conditions immediately below and surrounding the collapse feature particularly below adjacent private properties
- 3 window sampler boreholes to the rear of number 8 Fontmell Close
- 11 super heavy dynamic probes to the rear of numbers 8 and 10 Fontmell Close
- 3 hand dug trial pits to inspect the foundations of 9 and 11 Fontmell Close



- Production of exploratory hole Logs
- Interpretation of the ground conditions
- Production of a Ground Subsidence Investigation Report



2 Ground Investigations Completed

2.1 Geophysical Surveys

- 2.1.1 An initial geophysical survey was carried out by Geotechnology Ltd, acting on behalf of HCC (ref: Ground Collapse at Fontmell Close, St Albans, Microgravity Report, Report Number 1531r1v1d1015). This survey, undertaken shortly after backfilling the collapse, was focused on the highway and included the full length of Fontmell Close and Bridle Close. The survey results have been used to inform design of the follow-on intrusive investigations coordinated by Opus acting on behalf of HCC below the highway as well as those coordinated by PBA in the immediate area of the ground collapse.
- 2.1.2 Two further geophysical surveys were carried out by RSK, instructed by GCG on behalf of the loss adjusters, to encompass the private properties adjacent to the collapse (refs: Fontmell Close, St Albans, Geophysical Report, Project No. 191366 dated November 2015, RSK and Fontmell Close, St Albans, Geophysical Report, Project No. 191428 dated December 2015, RSK). These surveys have also informed the intrusive investigations coordinated by PBA.

2.2 Enabling Surveys

- 2.2.1 Prior to any intrusive work commencing PBA instructed Site Vision Surveys to complete a topographical survey and utilities survey of the site. The records from these surveys are presented within **Appendix 1.** In addition, level monitoring was carried out upon the concrete plug and properties around to check whether any significant movement was occurring.
- 2.2.2 A ground investigation was designed, risk assessed (with input from the stakeholders and GCG) and coordinated on site by PBA. The investigation was undertaken between 2 December 2015 and 27 January 2016, suspended over the Christmas period from 18 December 2015 to 4 January 2016. During this investigation, three cable percussion boreholes were sunk by Terra Firma Ground Investigations Ltd and twenty two rotary drilled non-cored boreholes were sunk by Forkers Limited. To investigate a localised ground depression to the rear of 8 Fontmell Close, eleven super heavyweight dynamic probes and three window sampler boreholes were sunk by Stunt Drilling Ltd. Hand dug trial pits to inspect the foundations of 9 and 11 Fontmell Close were carried out by Harcross Ltd who acted as Principal Contractor for the duration of the works on site.
- 2.2.3 All exploratory holes were logged by PBA and the investigation records can be found in **Appendix 2** with exploratory hole locations provided on **Figure 2**.
- 2.2.4 The cable percussion boreholes, window sampler boreholes and dynamic probes were carried out in accordance with the British and European Standard BSEN ISO 22476-2:2005, Geotechnical Investigation and Testing.

2.3 Super Heavy Weight Dynamic Probes

2.3.1 Super heavy weight dynamic probing was undertaken to the rear of 8 and 10 Fontmell Close. The technique employed consists of driving a rod with an oversized cone at its base into the ground with blows from a percussive hammer with a uniform weight (63.5kg) and drop height (760mm). The blow count is recorded for each 100mm of driving (N100 value). The results of the probes are presented as N100 values versus depth. Side friction on the driving rods or torque is measured every metre. The torque value provides a guide to the friction build-up with depth showing the horizons where the recorded blow counts also incorporate a degree of energy input to overcome friction. The method of ground investigation conforms to the British and European Standard BS EN ISO 22476-2:2005 Geotechnical Investigation and Testing, Field Testing, Part 2 Dynamic Probing.



- 2.3.2 The dynamic probes were positioned across minor ground depressions noted within the two rear gardens. The probes, taken to depths of up to 16.4m bgl, provide a ground strength profile plotted against depth of penetration.
- 2.3.3 The recorded N₁₀₀ values, plotted versus depth, have been interpreted in terms of profile shape, the blow counts, pattern and side friction. The N₁₀₀ values can be combined over a depth interval of 300mm to derive N₃₀₀ values which in turn can be used to classify the ground from a stability perspective as being undisturbed, relaxed or disturbed as shown in the table below.

N ₃₀₀ Values	Interpreted Ground Condition
<u><</u> 5	Very weak/voided/disturbed Ground
6 – 10	Reduced strength/relaxed Ground
>10	Undisturbed Ground

2.4 Window Sampler Boreholes

- 2.4.1 In order to confirm and clarify the shallow geological sequence present, a series of window sampler boreholes were undertaken to the rear of 8 Fontmell Close. These boreholes, taken to depths of up to 4.0m bgl, were positioned where it was anticipated that reasonable ground penetration to depth could be achieved.
- 2.4.2 The window sampling technique involves percussively driving hollow, small diameter, metal sample tubes of between 1m and 2m in length into the ground. The sample tubes are driven into the ground using the same rig that was used to perform the probes. The sampling tubes have a cutting shoe attached at the driving end. Copies of the exploratory hole logs are presented in **Appendix 2** and their locations are shown in **Figure 2**.

2.5 Cable Percussion Boreholes

- 2.5.1 Three cable percussion boreholes were completed, two below the highway and one in the front garden of 8 Fontmell Close. These boreholes were sunk to confirm the geological sequence and to confirm the nature of the ground conditions in areas where the geophysical surveys had inferred either relatively undisturbed or edge of anomalous ground conditions. BH101 refused due to encountering loose sands at 22.5m bgl, whilst BH102 and 103 were terminated in chalk at 24.9m bgl and 31.45m bgl respectively.
- 2.5.2 The cable percussion technique involves dropping a shell (cohesionless soils) or auger (for cohesive soils) from up to 3 metres above ground level from a derrick of around 6 metres in height. The drop is self-weighted. Standard penetration tests (SPT) were carried out at 1m intervals for 5m, then every 1.5m thereafter. SPTs provide an additional density test and were carried out in order to determine the depth at which competent chalk was encountered. Cable percussion techniques were carried out in accordance with BS 5930:1999+A2:2010.
- 2.5.3 The soil strata encountered were logged in accordance with BS 5930:1999+A2:2010, BS EN ISO 14688-1:2002 and CIRIA C574. Copies of the exploratory hole logs are presented in **Appendix 2** and their locations are shown in **Figure 2**.

2.6 Rotary Boreholes

2.6.1 Twenty two rotary drilled non-cored boreholes were completed. Sixteen of these holes were completed from the surface of the foamed concrete backfill to the collapse and were drilled both vertically and at raking angles to investigate the ground below and immediately



surrounding the collapse. Two further vertical holes were positioned upon the highway, to the east and west of the collapse. Two angled holes were also drilled below 1 Bridle Way, and two more below 8 and 10 Fontmell Close.

- 2.6.2 The technique for these holes included using rotary drilling methods to advance both casing and drill rods together to the desired termination depth. Minimal water was added as required to assist the drilling process. This approach was adopted to minimise the risk of triggering ground movement by the boring process in case further voids were present in the ground. Drill cuttings were returned to the surface during drilling process which enabled logging of the strata encountered. The lead driller completed driller's logs for each borehole.
- 2.6.3 In addition to soils descriptions, in order to facilitate interpretation of the ground conditions and improve interpretation of the ground model, a series of drilling parameters were measured per 500mm drilled as follows:
- a. Penetration rate (sec)
- b. Applied Drilling Pressure (bar)
- c. Air Pressure (bar)
- d. Rotary Drilling Speed (rpm)
- e. Flush Returns (%).
- 2.6.4 During the drilling process, the applied drilling pressure, air pressure and rotary drilling speed were kept constant for all boreholes with the only variable being, penetration rate. The resulting rate of ground penetration enabled interpretation of the relative density of the ground being penetrated. This process is a proven method for identifying weak, disturbed or voided ground conditions. The data gathered is presented within **Appendix 3**.

2.7 Level Monitoring

- 2.7.1 Gryphon Surveys were employed by the loss adjustors to monitor the ground level including the concrete plug.
- 2.7.2 The results of the monitoring of the concrete plug have been provided to PBA, and can be seen in **Figure 6**. The monitoring data was reviewed during the investigation works and used to check that there was no ground movement of concern occurring during the work on site.
- 2.7.3 It should be noted that MP14 and MP15 were destroyed when Forkers' rig was placed on the concrete plug. These were replaced as MP14a and MP15a but again these were destroyed. One reading was not possible for MP16 due to the position of the rig at the time.
- 2.7.4 Additionally Forkers employed the use of oscillating laser levels to check for signs of sudden ground movement between the surface of the concrete plug and the existing road surface beyond as the drilling work took place. This provided a further safeguard as the investigations proceeded and assisted with the ongoing risk assessment process.



3 Ground Investigation Results

3.1 Geophysical Survey Results

- 3.1.1 The geophysical survey completed by Geotechnology Ltd identified a number of gravity anomalies below the highway. Anomaly A was located immediately to the west of and adjacent to the collapse. The anomaly was considered by the survey company to be a potentially self-supporting void within the chalk bedrock, at an estimated depth of 19m below ground level, posing a risk of further ground instability.
- 3.1.2 The further geophysical surveys carried out by RSK within the land occupied by the privately owned properties adjacent to the highway partially corroborated the earlier Geotechnology Ltd survey results, and showed that Anomaly A potentially extended to the south, below private property. The survey company acknowledged that the geophysical anomalies identified may be representative of either, void space within the chalk bedrock, or shallow depth variation in the density of fill materials associated with the backfilling of the clay pits.

3.2 Ground Investigation Results

- 3.2.1 In the first instance it was decided to carry out three cable percussion boreholes (BH101 to BH103) to evaluate the nature of the ground to confirm the results of the geophysical survey and the stability risk assessment. BH101 was positioned in the highway to the north east of the collapse to confirm that stable ground was present at this location as indicated by the geophysical survey. It was necessary to prove this before a tracked rotary drilling rig could be brought to site and positioned upon the concrete plug within the collapse.
- 3.2.2 The borehole BH101 found Made Ground/ Reworked Ground to 5.5m bgl underlain by clays and sands of the Lambeth Group. The borehole was terminated in the Lambeth Group at 22.5m bgl due to encountering loose sand which blocked the borehole preventing progress.
- 3.2.3 BH102 was completed in the front lawn of Number 8 Fontmell Close at another location where stable ground was expected north of the collapse and at the edge of the anomalous ground conditions suggested by the geophysical survey. Made Ground and Reworked Ground was encountered to 10m bgl. This was underlain by 8.9m of Lambeth Group deposits. Chalk was encountered at 18.9m bgl and the borehole was terminated at 24.9m bgl. The Chalk was very weak to weak and included a band of sandy clay, possibly associated with a localised karstic feature.
- 3.2.4 BH103 was drilled to the west of the feature, within the highway at another position where the ground was assessed as being stable. This borehole encountered Made Ground to 7.5m bgl, largely consisting of very loose, black, ash material. This was underlain by the Lambeth Group to 25.7m bgl and Chalk to the termination depth of 31.45m bgl.
- 3.2.5 Consequently the cable percussion boreholes confirmed the expected stability of the ground as previously risk assessed and they also confirmed what the nature of the variable ground conditions were that had been detected by the geophysical surveys. It was evident that the survey technique was detecting variable thickness and density in the backfill materials within the old historical clay pits that underlay the area. These findings were important in realising that the source of the ground instability was somewhat deeper than the backfilled old pits and the depth of penetration of the geophysical surveys. They also demonstrated that large scale shallow voids did not appear to be present allowing a re-assessment of the stability risks for continuing the ground investigations. The next stage was to carry out deeper level boreholes drilled from the concrete plug which was also being level monitored.
- 3.2.6 The following table summarises the ground conditions encountered in the twenty two boreholes drilled using rotary open hole methods. It should be noted that within the depth



columns due to the holes being drilled at angles, the upper number, in black, indicates the drilled length, whilst the lower number, in red, indicates the corrected vertical depth, below ground level.

BH No	Depth of Hole (m)	Depth of Made Ground (m)	Thickness of Lambeth Group (m)	Depth to top of Chalk (m)	Additional Comments
BH201	26.0	7.5 7.4	11.5 <mark>11.3</mark>	19.0 <mark>18.7</mark>	Concrete plug 3m thick
BH202	30.0	6.0 5.6	20.5 19.3	26.5 24.9	Concrete plug 2m thick
BH203	32.0	7.5 <mark>6.7</mark>	23.2 20.7	30.7 27.4	Concrete plug 3m thick
BH204	34.0	7.5 6.5	21.0 18.2	28.5 24.7	Concrete plug 3m thick Lambeth Gp/Chalk contact disturbed
BH205	34.0	7.0 6.5	13.5 12.5	20.5 19.0	Concrete plug 3.5m thick Lambeth Gp/Chalk contact highly disturbed
BH206	40.0	6.5 5.9	11.5 10.4	17.5 <mark>15.9</mark>	Concrete plug 4m thick Lambeth Gp/Chalk contact disturbed
BH207	40.0	7.5 7.0	9.5 <mark>8.9</mark>	16.5 <mark>15.5</mark>	Concrete plug 3.5m thick Lambeth Gp/Chalk contact disturbed
BH208	48.0	34.0 34.0	10.1 10.1	44.1 44.1	Concrete plug 4m thick Very soft Made Ground 13.0 – 34.0m
BH209	40.0	7.5 <mark>6.6</mark>	10.5 <mark>9.3</mark>	18.0 <mark>15.9</mark>	Concrete plug 4m thick Lambeth Gp/Chalk contact disturbed Weaker zone in chalk 25m to 35m
BH210	47.5	7.5 7.2	38.5 <mark>36.8</mark>	46.0 44.0	Concrete plug 3.5m thick Lambeth Gp/Chalk contact disturbed
BH211	40.0	3.5 3.3	15.5 14.8	19.0 18.2	Concrete plug 3.5m thick Lambeth Gp/Chalk contact is disturbed
BH212	40.0	6.5 <mark>6.4</mark>	5.5 5.4	12.0 11.5	Concrete plug 3m thick
BH213	50.0	10.0 <u>9.9</u>	12.0 11.9	22.0 21.8	Concrete plug 5.5m thick Lambeth Gp/Chalk contact is disturbed Very weak zone in chalk 29.5m – 34.0m and also weaker 38m – 47.5m



BH No	Depth of Hole (m)	Depth of Made Ground (m)	Thickness of Lambeth Group (m)	Depth to top of Chalk (m)	Additional Comments
BH214	50.0	14.0 13.9	7.5 7.4	21.5 21.3	Concrete plug 5m thick Weaker zone in chalk 31.5m – 36m
BH215	40.0	6.0 <mark>6.0</mark>	13.5 13.5	19.5 <mark>19.5</mark>	Drilled vertically Heavily weathered chalk surface to 26.5m
BH216	50.0	3.0 3.0	42.0 42.0	45.0 45.0	Drilled vertically Very soft drilling 39.0 – 45.0m showing disturbed Lambeth Gp above chalk surface
BH217	46.5	23.5 23.3	2.0 2.0	25.5 25.3	Concrete plug 5m thick Lambeth Gp/Chalk contact is disturbed
BH218	50.0	17.5 17.4	2.0 2.0	19.5 19.4	Concrete plug 4.5m thick Lambeth Gp/Chalk contact disturbed and chalk highly weathered to 34m. Very weak zone 34.0 – 42m
BH219	40.0	11.0 10.9	13.5 <mark>13.3</mark>	24.5 24.3	Lambeth Gp/Chalk contact is disturbed 18.5m – 24.5m
BH220	40.0	10.0 <mark>9.9</mark>	8.0 7.9	18.0 17.8	Lambeth Gp/Chalk contact is disturbed 15.5m – 22m Sandy layer within chalk 29.5 – 33.5m
BH221	42.0	8.0 7.7	18.0 17.4	26.0 25.1	Highly weathered chalk surface 26m – 30.5m
BH222	40.0	7.5 7.3	16.5 16.0	24.0 23.3	Highly weathered chalk surface 24m – 28m

- 3.2.7 The results above indicate significant variation in the depth to the chalk bedrock, ranging from 11.5m to 45.0m bgl. The depth to the base of the Made Ground encountered also varies significantly, from 3.0m bgl below the highway to the north east side of the collapse, to 34.0m bgl below the foamed concrete plug in the collapse. The concrete plug thickness also varies locally from 2m to 5.5m.
- 3.2.8 During the drilling process drilling parameters were recorded and the records of these are presented within **Appendix 3.** It should be noted also that all boreholes drilled were backfilled with a cement bentonite grout mix on completion to seal them and prevent them forming a preferential path for drainage in the future.
- 3.2.9 A series of dynamic probes and window samples were carried out to the rear of 8 and 10 Fontmell Close, to investigate localised ground surface depressions. All the probes sunk, terminated in dense material at significantly shallower depth that the design depth.



- 3.2.10 A total of 11 dynamic proves (DP401 to DP411) were completed by Stunt Drilling Ltd to depths of between 3.0m and 16.4m below ground level (bgl). Three window samples (WS501 to WS503) were also completed, to depths of between 3.0 and 4.0m bgl.
- 3.2.11 The table below provides a summary of the terminated depth of the probes and window samples completed (bgl).

Probe/ Borehole	Terminated Depth (bgl)
DP401	6.5m
DP402	6.6m
DP403	6.5m
DP404	6.2m
DP405	16.4m
DP406	3.0m
DP406a	8.3m
DP407	8.1m
DP408	12.7m
DP409	11.5m
DP410	7.8m
DP411	8.5m
WA501	4.0m
WS502	3.0m
WS503	4.0m

- 3.2.12 Dynamic probes DP401, DP402 and DP403 were completed from a platform constructed by Harcross Specialist Contractors over a shallow depression in the rear garden of number 8. These probes showed a very weak ground profile to approximately 3m bgl. Below this depth the ground strength increases, with all three probes refusing at between 6.5m and 6.6m bgl. Window sample WS502 was also completed from this platform. Made Ground was encountered to 1.0m bgl. Between 1.0 and 3.0m bgl there was no recovery, due to an obstruction blocking the sampling tube. For this reason this window sample was terminated early.
- 3.2.13 DP404 and DP405 were completed within a further small depression had been noted in the grass, thought to be associated with a drainage line. These probes showed very weak ground to between 2.0m and 2.5m bgl, below which ground strength increases. DP404 refused at 6.2m whilst DP405 refused at 16.4m.
- 3.2.14 DP406, DP406a and DP407 were completed near a second small depression, thought to be associated with an old tree location. DP406 was terminated early due to inclination of the rods, and was moved slightly and retested as DP406a. DP406a showed very weak ground to 2.9m



bgl and below this the ground strength increased showing similar blow counts (mostly 3s and 4s) to 5.8m bgl. The ground strength then improved further until the termination depth was reached at 8.3m bgl where refusal occurred in undisturbed ground. DP407 shows a very weak profile to 5.2m bgl, followed by an increase of strength (blow counts 3s to 5s) to 7.0m bgl. Below this there is a further rapid increase in strength to a termination depth of 8.1m.

- 3.2.15 WS503 was completed between these two depressions in the grass where Made Ground was encountered to the termination depth of 4.0m bgl.
- 3.2.16 DP408 and DP409 were completed upon the rear patio of number 8 along with WS501. This was to investigate some movement that had occurred below the patio slabs, thought to also be associated with drainage. DP408 shows a very weak profile to 8m bgl, below which ground strength increases slightly 10m depth and then further improves below to the termination depth of 12.7m bgl. DP409 shows a very weak profile to 6.5m bgl except for a denser layer at 5m depth. Below this the ground strength progressively increases to the refusal depth of 11.5m bgl. WS501 shows a Made Ground profile to the termination depth of 4m.
- 3.2.17 DP410 and DP411 were completed in the rear garden of number 10, in line with the depression in the rear garden of number 8. The ground strength profiles for DP410 and DP411 are similar to those of DP402 to DP404, showing very weak ground to between 5m and 6.1m bgl. Below this the profiles indicate stronger ground to the termination depths of 7.8m and 8.5m bgl respectively.
- 3.2.18 The results appear to indicate variable depths of weak backfilled ground associated with the infilling of the former clay pits at the site below the position of the garden depression. It seems likely that the depressions forming in the garden of number 8 are possibly related to where utility services pass through the filled ground.

3.3 Existing Foundations

- 3.3.1 Three trial pits were dug by hand to expose foundations (TP301 to TP303). TP301 was completed under the extension of number 11 Fontmell Close and exposed a 200mm diameter steel pile beneath a 450mm thickness concrete slab.
- 3.3.2 TP302 was completed under the original part of number 11 Fontmell Close. This pit showed the house to be founded on a concrete slab of 500mm thickness. Further hand excavations were carried out under the concrete foundation but the inside edge of the concrete could not be found, suggesting that the original house was built upon a raft foundation.
- 3.3.3 TP303 was completed at number 9 Fontmell Close and encountered a 400mm diameter concrete pile beneath a 600mm thickness concrete slab.
- 3.3.4 Figures A-C show profiles and photos of all the pits completed and are presented within **Appendix 4**.
- 3.3.5 The depths of the piles at the two properties are unknown and further works would be required to establish these depths.
- 3.3.6 The foundations that could be viewed appeared to be in good condition.

3.4 Geotechnical Laboratory Testing

- 3.4.1 Geotechnical laboratory testing was carried out on selected samples to verify the geotechnical classification properties of the materials encountered.
- 3.4.2 The testing was performed by Geolabs Ltd which holds UKAS certification for the majority of tests scheduled.



- 3.4.3 A total of 4 samples for the exploratory holes were submitted to Geolabs for geotechnical testing. The laboratory certificates of geotechnical analysis are presented in **Appendix 5**.
- 3.4.4 The following table summarises the geotechnical soil testing scheduled by PBA.

Number of Tests	Description
4	Particle Size Distribution with Pipette: BS1377: Part 2: Clause 9.2, BS1377: Part 2: Clause 9.4
4	BRE Digest SD1 Suite B: 2005 Concrete Aggressivity Suite

3.4.5 Measured sulphate and pH values determined upon samples of Lambeth Group deposits as part of the soils testing are summarised in the table below.

Determinand	Range
2:1 Water / soil extract SO ₄ (g/L)	0.04 – 0.59
pH Value	7.2 – 7.5

- 3.4.6 Using procedures outlined in BRE Special Digest 1, 3rd Edition, (BRE, 2005) and based upon the results to date the Design Sulphate Class for the site would be DS-2 and buried concrete proposed for the site would therefore have to be designed for Aggressive Chemical Environment for Concrete (ACEC) Class AC-2. It is however, noted that only one of the four tests performed recorded relatively high sulphate concentrations with all other concentrations at or below the threshold for Design Sulphate Class DS1. It is possible that the sulphate class could be lowered if a larger dataset is obtained via further soil testing.
- 3.4.7 The results of the particle size distribution classification testing broadly confirmed the soil descriptions provided on the borehole logs.



4 Interpretation of Ground Conditions

4.1 Geological Sequence

- 4.1.1 The results of the recent investigations confirm the general published geological conditions for the local site area based on the sequence found although the shallow surface conditions have been greatly modified by the historical excavation and removal of clays for brick making.
- 4.1.2 Cross sections through the collapse feature in an east to west direction (**Figure 3**) and along a north to south orientation (**Figure 4**) illustrate the significant variation in the Chalk, Lambeth Group and Made Ground levels across the site. Similar variation in levels of the geological sequence has been found within the boreholes below the highway undertaken by Opus acting on behalf of HCC outside of the collapse area.
- 4.1.3 The Lambeth Group deposits generally comprise the Reading Formation overlying the basal deposits of the Upnor Formation. Typically the Upnor Formation comprises a few metres of green (glauconite rich) sands or clayey sands often with black-coated rounded flints. At the base there can be green-coated rounded flints and other flint nodules within brownish green sand to sandy clay matrix. During the investigation at the site no evidence of the presence of the Upnor Formation was found in the boreholes. This agrees with the observations of Catt (2010) who suggests that apart from the southern portion of Hertfordshire and into the London area it is probable that the Upnor Formation is absent
- 4.1.4 It is to be expected that the historical excavations on the site have preferentially extracted clays in order to make bricks therefore the Reading Formation deposits remaining below the Made Ground are dominated by lithologies that were considered unfavourable for brick making. A schematic interpretation of the developmental stages relating to clay excavation and chalk mining at depth (discussed later below) is presented in **Figure 5** in order to explain the nature of the ground conditions encountered.
- 4.1.5 According to Catt (2010), based on past exposures described in Hertfordshire, the deposits typically comprise variously coloured mottled clays containing thin beds of brown, pale yellow, grey or white sand and occasional thin laminae of grey or brown clay. The upper portion of the sequence tends to be dominated by clays underlain by sands. However, local variations to this sequence can occur. The exploratory holes at the site did not encounter any mottled clays.
- 4.1.6 Generally in the boreholes the colours of the deposits vary from brown to yellow brown, orange brown, reddish brown to grey. With the clays removed, the remaining deposits are dominated by variably sandy, clayey gravel changing to variably sandy gravel and elsewhere becoming variably sandy, gravelly clay. Sometimes clays, sandy clays and sands were found but the granular lithologies dominated.
- 4.1.7 Catt (2010) indicates that a typical thickness of the Reading Formation in Hertfordshire is less than 16m, however the exploratory holes on site found significant thickness variations. One of the major reasons for the variation is that the Lambeth Group deposits have been piped down into the Chalk below. This has been caused by karstic dissolution of the underlying chalk surface. As outlined in 3.2.6 above, as a result of dissolution, the chalk surface level varies from 11.5m bgl (BH212) to 45m bgl (BH216). Another characteristic of many of the borehole profiles (BH204 to BH207, BH209 to BH211, BH213, BH216 to BH220) is that they exhibit a mixing of the chalk and Lambeth Group deposits in a manner which is often observed within steeply dipping contact zones at the margins of solution pipes. At depth within BH220 there is also a substantial infilled zone of sand between 29.5m bgl and 33.5m bgl which is interpreted to be a sheet pipe often found at depth in areas subject to large scale solution pipes. Sheet pipes are created by dissolution extending laterally outwards from solution pipes along bedding planes, often former paleo-water table levels. Some boreholes (e.g. BH215, BH218,



BH221 and BH222) have also intersected chalk surfaces showing signs of karstic weathering whereby it has caused the chalk to become discoloured – often cream or light brown.

4.1.8 It is often the case that as a result of solution subsidence the infilling deposits within solution pipes are in a softened and loosened metastable state, however, it also possible that older solution pipes (that have not been re-activated) might contain more compacted infills having had a longer period of settlement or else have been compacted by glacial ice loading. The majority of the boreholes at the site intersecting solution pipes show that the pipes have compact infills. The only boreholes that found evidence of some softening of the infills at their base are BH210 and BH218.

4.2 Ground Model

- 4.2.1 The investigation results have been carefully considered. Based on analysis of past projects involving ground collapses over solution features and chalk mines it is recorded (Edmonds 2008) that the void space within solution pipes, even those up to 50m depth, does not usually produce sinkholes that exceed 5m in diameter. However, chalk mines tend to contain larger volumes of void space and are capable of producing rather larger crown holes that can exceed 10m in diameter. Consequently, on balance, the cause of the collapse at Fontmell Close is considered to have a man-made origin (see **Figure 5**).
- 4.2.2 Confirmation of this cause has been provided by the drilling results of BH208 and some of the surrounding boreholes (BH213, BH214, BH217 & BH218). BH208 was drilled vertically down through the concrete plug close to the centre of the collapse and the results revealed the presence of a shaft extending to at least 34m bgl with the Chalk not being encountered until 44.1m bgl. Below the Made Ground there were Lambeth Group deposits present above the chalk and given the depth of the chalk surface it is considered that the borehole has also coincided with the position of a solution pipe.
- 4.2.3 In the north to south direction boreholes BH213 and BH214 drilled steeply to either side of BH208 found chalk at shallower depths of 21.8m and 21.3m bgl respectively. The rapid change in chalk levels tends to confirm that this is most likely as the result of a solution pipe being present. The drilling also detected a notably weaker zone in the chalk profile at about 29m to 33m bgl in BH213 and at about 31m to 36m bgl in BH214. These zones are most likely indicating disturbance due to possible mined ground.
- 4.2.4 In the east to west direction boreholes BH217 and BH218, also drilled steeply to either side of BH208, encountered the chalk surface at 25.3m and 19.4m bgl respectively. Again the shallower chalk levels are indicative of a solution pipe. It was also noted in BH217 that between 25.3m and almost 39m bgl that the chalk was mixed with Lambeth Group sand suggesting that the borehole had passed down through the steeply dipping karstic margin to the solution pipe detected in BH208. There was similar evidence of a karstic margin found in BH218 down to almost 34m bgl, however below this the drilling was extremely soft down to about 41.2m bgl strongly suggesting disturbance as a result of past mining excavation.
- 4.2.5 Based on these results it is interpreted that a shaft was sunk in the base of the clay pit down through the central axis of the solution pipe and then the miners excavated laterally into the closely adjacent chalk walls beyond the solution pipe margin to extract chalk from an irregular bellpit style of mine. It seems that the miners preferentially dug outwards into the chalk mostly below the northern, western and southern portions of the collapse where they presumably found chalk of a suitable quality.
- 4.2.6 Analysis shows that the possible roof level of the excavated zones deepened from around 29m depth in the north through 34m depth in the west and then 31m depth in the south. It is not unusual for the height of the working excavation to be around 5m to 10m high, sometimes with extending niches. On this basis, volumetric calculation suggests that the amount of soil material that collapsed into the ground to form the surface collapse (crown hole) could be accommodated by collapse into an irregular open bellpit that was 7m high and 7m radius via a



shaft that was 2m in diameter. Such dimensions are entirely feasible based on chalk mine records contained in the PBA mining cavity database archives.

4.2.7 Furthermore, the style and scale of the mining is logical given that deeply penetrating solution pipes are present which locally limit the lateral extent to which mines can extend before a mine breaches an adjacent solution pipe. It is also concluded that the clay dug at the surface from the old pits must have been exploiting clay deposits that locally deepened and infilled the central cores of the solution pipes. This pattern of clay extraction explains why the surface quarries are a series of rounded, deep pits centred over solution features, rather than broader scale, shallower pits that are quasi-rectangular in shape as found where laterally extensive layers are being quarried. Positioning a shaft at the base of the pit also reduces the depth of excavation to reach chalk for mining purposes.



5 Remedial Measure Options

5.1 Assessment of Stability

- 5.1.1 As indicated in Section 4 of this report, the ground investigations have shown that there is significant variation in the near surface geology, the variations in Made Ground thicknesses reflecting the pattern of historical excavation and backfilling to former clay pits. Despite the extended time over which backfilling has taken place the deposits, presumably because they have been end-tipped and were never compacted, remain in a relatively soft state. The geophysical survey results confirm the low density nature of the clay pit backfilling materials. Therefore they remain in a quasi-equilibrium compaction condition that is prone to disturbance in the presence of water, particularly escapes of water from leaking utility services. Where such escapes of water occur then it is likely that inundation settlement and erosion of fines might result to cause minor surface depressions in open ground areas and below the highway.
- 5.1.2 The depressions formed in the rear garden of number 8 Fontmell Close appear to be related to possible leaking water from utility service pipes in the ground formed by the mechanism outlined in 5.1.1 above.
- 5.1.3 Investigations have shown that the major collapse below the highway is deep seated, to about 40m or so in depth below the surface, but is relatively localised in terms of its spatial extent. As discussed in section 4.2 above and shown in Figures 3 & 4, the collapse overlies a deep backfilled historical clay pit (circa 20m or so deep) that is coincident with a deeply penetrating solution pipe (circa 44m deep) in which a shaft (5m to 10m deep) has been dug below the pit to create an entrance down into an irregular bellpit mine working below (see Figure 5). It is likely that the plan layout of the mine, perhaps 5m to 10m in working height, extends only for a limited distance (perhaps only 7m) into the chalk beyond the solution feature margin. Consequently the plan extent of disturbed mined ground at depth is largely contained within the plan area of the observed surface collapse (crown hole).
- 5.1.4 During the ground investigation works, as access has allowed, level monitoring has been carried out upon the concrete plug. The results, plotted as plug ground level changes against time, are shown in Figure 6 and the same results plotted as a log scale are shown in Figure 7. The log scale data has been interpreted to produce an average trend line of the settlement plotted and projected forward in time. According to the trend line, over a 27 year period, it is estimated that the concrete plug will settle about 50mm or so. About half of the estimated settlement has already occurred during the monitoring period. This assumes of course that the same status quo ground conditions continue and excludes the effects of future water penetration into the ground from exceptional rainfall events, soakaways and leaking water services.
- 5.1.5 Careful consideration of the ground investigation results below the insured properties surrounding the collapse in the highway has shown that below the Made Ground the geological sequences are essentially undisturbed in respect of impacts due to past chalk mining. Borehole 210 below number 9 Fontmell Close encountered chalk at 44m bgl with signs of softening reported during the drilling within the zone immediately above the chalk but this is consistent with the presence of a solution pipe at this location. The natural ground above was described as stiff to very stiff in consistency and the drilling times also confirm that the ground is relatively hard. Below number 11 Fontmell Close boreholes BH204 and BH205 indicate deepening chalk levels by comparison with BH206, probably showing proximity to another solution pipe, but in all cases the natural sequences do not show any evidence of disturbance due to past chalk mining activities. The boreholes beneath numbers 8 and 10 Fontmell Close and number 1 Bridle Close also do not show any disturbance at depth due to past chalk mining activity.



- 5.1.6 Therefore in terms of the insured properties surrounding the collapse in the highway there is no evidence of ground instability at depth below them. The effects of recent instability are just limited to encroachment of the original collapse upon the front gardens of 8, 9 and 11 Fontmell Close. The supporting ground conditions beneath the insured properties remains much as it was before the major collapse in the highway. At shallow level the concrete plug is beneficial to providing some lateral support to the front gardens of the insured properties and therefore careful consideration will need to be given to the construction sequence of the final reinstatement of the highway and utility services to ensure that support continues so that the front gardens of the insured buildings are suitably protected from further damage.
- 5.1.7 Whilst future settlement of the collapse at shallow level would have the potential to impact the highway and adjacent front gardens of 8, 9 and 11 Fontmell Close, it does not appear that the properties (buildings) are at significant risk of instability. Remedial measure options are therefore considered below in terms of the potential for future settlement of the collapse and impacts to the highway and services passing over the collapse area as well as the front gardens of the insured.

5.2 Remedial Measures – Reinstatement

- 5.2.1 Due to the level of disturbance to the material within the collapse, the presence of a natural karstic feature (solution pipe) and deep seated very weak collapse material extending down to circa 40m associated with the old chalk mine workings at depth, further future settlement of this material can be expected over time. The degree of such settlement can be influenced by a number of factors, including the gradual settlement of the disturbed fill due to self-weight compaction, or increased rates of settlement following water inundation (e.g. due to leakage from water-carrying utility services or possibly downward percolating water following exceptional rainfall events).
- 5.2.2 In the latter case outlined in 5.2.1 water inundation can potentially cause settlement of deep loose soil columns of the order of 50mm to 250mm or more based on past experience. However, the concrete plug, given its size and thickness, is likely to bridge over localised settlement. Wholesale settlement of the plug would require loss of passive support beneath the entire plug footprint and shear failure of the ground around its margins. This form of failure, if it should occur, would probably take several years or more to manifest itself. Longer term surface monitoring (levels and visual appearance of the surface) could be used to check for signs of re-activation of settlement over and above that expected as outlined in 5.2.3.
- 5.2.3 As discussed in section 5.1.4 above, although prediction of the medium to long term ground settlement is difficult, it is not unreasonable to suggest that the settlement of the ground surface should be anticipated to be at least 50mm or more (excluding the uncertainty and impacts of other causal factors as outlined in 5.2.1 and 5.2.2). About half of the predicted settlement has already been achieved during the monitoring period.
- 5.2.4 The placement of foamed concrete into the collapse provided a short term means to create a stable plug to support the sides of the collapse to arrest lateral degradation of the ground around the collapse and attempt to limit vertical movement. Now that the investigations have found no significant voids in the ground below and that longer term settlement rather than further major ground collapse is the main concern, the plug can continue to perform a useful role. Its presence will help to spread surface loading and will assist with resisting differential settlement movement of the surface across its footprint. Around the edges of the plug, however, differential settlement is likely to result over time.
- 5.2.5 In principle, subject to the longer term ground settlement issues described above being acceptable, then the utilities and highway could be reinstated leaving the concrete plug in place.
- 5.2.6 Careful consideration will need to be given to the level of say the sewer when reinstating the utility services across the concrete plug. If it is necessary to reduce the surface level of the



plug then cutting/grinding techniques should be used and percussive techniques avoided which might cause the plug to crack and break up. Alternatively some utilities might be able to re-route services to avoid crossing the plug. Where this is unavoidable then new utility connections would need to utilise suitably flexible connections where they cross the plug to allow for future possible settlement, particularly differential settlement over the edges of the plug.

5.2.7 Similarly, following backfilling above the plug with a compacted granular sub-base, a suitably flexible highway surface could then be reinstated over the collapse, again taking into account the potential for future settlement, particularly differential settlement over the edges of the plug.

5.3 Remedial Measures – Ground Improvement

- 5.3.1 If the overall ground settlement and differential settlement potential and associated uncertainty, as indicated in 5.2 above, is considered to present an unacceptable risk to the reinstatement of utilities and the highway then ground improvement techniques can offer a possible solution. Ground improvement techniques such as soil reinforcement can provide a means to reduce the impact of future settlement by creating additional support across the deeply disturbed and weakened ground extending to depth. It is unlikely that longer term settlement can be entirely mitigated but such techniques can help to minimise the effects of the overall settlement and differential settlement.
- 5.3.2 The specific ground improvement solution needs to be purpose-designed and specified. However, such works usually take the form of excavating the ground above the collapse feature (concrete plug in this instance and around its margins) and re-filling with suitably graded, compacted stone fill layers incorporating high tensile strength geogrid to form a reinforced soil horizon crossing the collapse zone. The reinforced soil layer needs to be extended beyond the plan limits of the collapse and sometimes anchoring can be incorporated to improve the lateral strength.
- 5.3.3 The effectiveness of shallow ground improvement can be enhanced by the construction of reinforced concrete capping or reinforced concrete beams, designed to span the area of collapse. In the particular situation at Fontmell Close and with the concrete plug present, however, it is not considered practically feasible to incorporate such measures.
- 5.3.4 The placement of the reinforced soil layer would need to take into account the level of the utility services that need to be reconnected. As indicated above, when relaying utility connections across the concrete plug, they will require suitable flexible couplings where they cross over the former collapse area and margins such that further settlement can be accommodated as necessary.
- 5.3.5 Should any excavation into the concrete plug be required (using techniques as discussed above in 5.2.5) in proximity to the plug margins that currently provide lateral support to the front gardens of the insured properties, consideration will need to be given to alternative means of support (e.g. sheet piling or similar). The final decision in terms of construction method and phasing of the works requires more detailed scoping, analysis and cost-benefit assessment.

5.4 Remedial Measures – Ground Treatment (Full and Partial)

5.4.1 If the overall ground settlement and differential settlement potential and associated uncertainty, as indicated in 5.2 above, is considered to present an unacceptable risk to the reinstatement of utilities and the highway, and a higher level of protection is desired, then ground treatment techniques can offer a possible solution.



- 5.4.2 Based on past experience the most effective long term remedial solution which has a good track record of mitigating the potential further movement of disturbed ground at collapse locations is to carry out compaction grouting. The technique can be used to stabilise remnant deep, loose columns of collapsed ground and reinstate support to the ground above. All works could be carried out from the existing concrete plug.
- 5.4.3 The grouting technique involves the injection of a viscous mortar grout into the ground under high pressure. The grout can radially compact weak, disturbed infills that are micro-voided, strengthening the ground and mitigating against future movement. The beneficial effects of the grouting can be achieved normally to within about 3m below the ground treatment surface. However, with the concrete plug in place then it may be possible to treat the ground up to the underside of the plug. Following treatment and dependent upon the levels in the ground to reinstall utility services it will be necessary to backfill with compacted granular fill as appropriate (as discussed in 5.2 above). Once the services are installed and the new road and pavement level is established it will be possible to reinstate the front gardens of the insured properties.
- 5.4.4 Another option variation for the grouting solution would be to limit the depth of grout treatment down to the zone containing the shaft entry into the old chalk mine workings and upwards to the concrete plug at the surface. The results of the ground investigations show that relatively strong, stable ground overlies and surrounds the small scale chalk mine workings suggesting that the risk of the mine working causing collapse and breakdown in the near future is low. In this way the volume of ground treated could be reduced (limited to say 30m depth) thereby saving costs compared with full depth treatment to 40m or so.
- 5.4.5 In order to progress with this remedial solution below the highway it would be necessary to prepare a suitable technical specification and to liaise with suitably experienced contractors. Further consideration of the merits and cost benefits for comparison with other remedial work alternatives would be best achieved by tendering after carrying out initial scoping and design for the works.

5.5 Remedial Measures – Performance Risk Matrix

5.5.1 To assist the process of considering the remedial measure options the relative performance risks of choosing one option over another is compared in the matrix below.

Remedial Measure Options	Construction details	Longer Term Integrity
Reinstatement	Compacted granular backfill above concrete plug and utilities re-connected using flexible couplings	Potential for long term settlement to cause damage to surfaces requiring maintenance, but utilities should be unaffected. Not able to withstand sudden induced settlement, although measures to control surface water drainage (see 5.6) would reduce this risk.
Ground Improvement	Compacted granular backfill above concrete plug with a geogrid reinforcement and utilities re-connected using flexible couplings	Reduced potential for settlement to cause damage to surfaces requiring maintenance, but utilities should be unaffected. Would be able to withstand a sudden induced settlement in the short to medium term but would require remedial



		maintenance eventually.
Ground Treatment (Partial)	Carry out compaction grouting treatment below the concrete plug down to mine shaft zone	Negligible surface settlement. Low potential for ground movement. Medium to long term stability. 10 year warranty
Ground Treatment (Full)	Carry out compaction grouting treatment from below the concrete plug to the base of the mined ground	Negligible surface settlement. Negligible potential for ground movement. Long term stability. 10 year warranty.

5.6 Remedial Measures – Control of Surface Water Drainage

- 5.6.1 As outlined in 5.1 above the infiltration of concentrated surface water drainage into the disturbed, backfilled ground can, in certain circumstances, trigger inundation settlement of the ground. Therefore, it would be desirable to check where soakaways are located in the front gardens of the insured properties to ensure that they are not contributing flows of water into the ground that are draining towards the collapse location. Should such soakaways be located then it would best to re-locate them as a precaution.
- 5.6.2 When the highway reinstatement is underway it would also be desirable to ensure that any road gulleys collecting surface drainage are directing the water away from the collapse position as well. Long pipe lengths with the minimum number of joints to reconnect the drainage system would be best, allowing for the effects of differential settlement as necessary where the pipes cross the edges of the concrete plug.

5.7 Shallow Depressions Rear of 8 & 10 Fontmell Close

5.7.1 The proximity of a number of drains suggests that leakage may have contributed to the observed settlement. A survey of the drains has been carried out by Harcross Ltd and reference should be made to their report regarding any repairs considered necessary. Regarding the depressions, they can be backfilled, compacted and raised in level to reinstate the surface as necessary. If the basal soils are particularly weak then consideration can be given to installing reinforcing geogrid as discussed in section 5.3 above.



6 Summary and Conclusions

6.1 Background

- 6.1.1 A major ground collapse occurred on 1 October 2015 below the highway of Fontmell Close, St Albans. The collapse extended beyond the footprint of the road and also caused the loss of adjacent land forming the front gardens and driveways of number 8, 9 and 11 Fontmell Close.
- 6.1.2 The collapse was backfilled with foamed concrete by HCC to form a plug, to within a metre of the original ground level. They also instigated a geophysical survey along the highway of Fontmell Close and Bridle Close. Insurers of the adjacent properties within the evacuated area around the collapse also funded a geophysical survey across the private land as well.

6.2 Current Situation

- 6.2.1 PBA has designed and coordinated a ground investigation to ascertain the ground conditions both underneath the plug and under the properties surrounding the collapse. Appropriate safety measures and monitoring have been undertaken as the work progressed. Variable thicknesses of old weak fill were found at shallow level forming the backfilling to old clay pits underlying the local area. Below this were Lambeth Group deposits of varying thickness above the Chalk at depth. Chalk was found at depths ranging between 11.5m bgl and 45.0m bgl. The variation occurs because of the presence of solution features in the form of solution pipes.
- 6.2.2 The work has determined the approximate extent of disturbed ground below the footprint of the collapse and the characteristics of the associated local ground conditions. The work found that the cause of the collapse was due to an irregular bellpit style of old chalk mine working at depth below the highway. The floor level of the mine working is circa 40m bgl.
- 6.2.3 The investigations found that the past chalk mining operations were of limited extent and were effectively contained within the footprint of the collapse below the highway. No evidence was found by the investigations that indicated further significant mined voids or laterally extensive mined ground present that impacted the surrounding insured properties or the ground beyond the margins of the collapse.

6.3 Way Forward

- 6.3.1 Numbers 8 to 11 Fontmell Close and 1 Bridle Close no evidence of mined ground or instability was found by the investigations below the properties (buildings). There has been some minor loss of ground adjacent to the collapse, but this can be re-instated once the highway and pavement have been re-constructed after remedial works have been carried out.
- 6.3.2 To the rear of numbers 8 and 10 Fontmell Close the depressions are believed to result from water leaking into the ground from the drains (see Harcross Ltd report for any actions). Regarding the depressions, they can be backfilled, compacted and raised in level to reinstate the surface as necessary. If the basal soils are particularly weak then consideration can be given to installing reinforcing geogrid as discussed in section 5.3 above.
- 6.3.3 A series of remedial measure options are put forward for consideration to treat the collapse location below the highway as follows:
 - Ground reinstatement
 - Ground Improvement
 - Ground treatment



- 6.3.4 The relative merits and predicted long term performance of the options are set out in the matrix within 5.5.1 above.
- 6.3.5 Surface water drainage controls are proposed to minimise the potential for triggering water inundation settlement of the disturbed weakened backfills in the vicinity of the collapse.



7 References

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Figures





user name: david cotton









Ground Level








J:\36121 Fontmell Close, St Albans\04 Data\[plug monitoring.xlsx]Fig 7



Appendix 1 : Utilities Services Drawing



DISCLAIMER. THE LOCATION OF UNDER GROUND SERVICES SHOWN ON THIS DRAWING HAS BEEN DETERMINED USING ELECTRO-MAGNETIC (AND/OR GROUND SERVICES HAVE BEEN DETERMINED ON THE SERVICES HAVE BEEN DETERMINED AND THE SERVICES HAVE BEEN DETERMINED AND THE SERVICES HAVE BEEN DETERMINED AND THE SERVICES THAT MAY CROSS THE SITE AND THE RELEVANT SERVICES, STRUCTURES OR OTHER BELOW GROUND OBSTRUCTIONS NOT INDICATED ON THIS DRAWING MAY BE SERVICES SHOULD BE BEEN DETERMINED AND AS BUILT DRAWINGS. EXCAVATIONS IN THE VICINITY OF SERVICES SHOULD BE CARRIED OUT WITH DUE DILIGENCE REF: HSG47 DOCUMENT AND THE SERVICES HAVE BEEN DETERMINED BY REFERENCE SHOULD BE CARRIED OUT WITH DUE DILIGENCE REF: HSG47 DOCUMENT FOR UTILITY LOCATION SERVICES.





SHEET LAYOUT

SCALE											
1:100										5м	
1:200										1 🛛 м	
1:500										25м	



Appendix 2 : Exploratory Hole Records

Projec	t Name				Р	roject No:				BOREH	IOLE
Font	mell Close, S	t Albans					3612	1		Donein	022
Client					s	tart Date	En	d Date			
Insu	rers of 8-11 F	ontmell Clo	se & 1 Bridle (Close an	d	02/12/20)15	07/12/2015		BH1	01
Contra	actor				G	round Level					
Vario	ous						121.86m	OD			
Metho	d/Plant				С	oordinates			Logged By: CW	Sheet 1	of 3
Pilco	on					515466	Е	208427 N	Checked By:	Scale	1:50
(m)	Sam	ples and Insit	u Tests	ter		Depth	Level		Stratum Docorintia		rum kfill
(11)	Depth	Туре	Results	Š Ľ	gen	(Thickness)	(m OD)				Inst enta /Bac
-						(0.30)	121.81	Concrete			
				E		0.35	121.51	MADE GROU	JND: Dark brown slight	ly sandy gravelly	
E				E		(0.65)		clay. Sand is coarse, angul	fine to coarse grained. lar to rounded, of brick	Gravel is fine to s. chalk. flint and	
- 1				E		1.00	120.86	carboniferous	s material. With occass	ional cobbles of	
Εl				E		×		brown sandy silty			
	1.50	С	N=4	E		X		clay. Sand is	fine to coarse grained.	With occasional	
Εl				E 🕅		×		graver of brick			
- 2				- E		×		From 1.8 - 2.0	0m black		
				E		×					
_	2.50	С	N=4			×					
				Ē		×					
- - 3						(3.80)					
				E		8					
	3.50	С	N=4			8					
				E		8					
- 4				F 🕅		8					
				E		8					
	4.50	С	N=7	Ē		×.					
				E		4.80	117.06				
_ 5				- E 🕅		8		grey slightly s	slightly gravelly silty cla	y. Sand is fine to	
				F 🕅		(0.70)		coarse. Grave	el is fine to coarse, and	jular to rounded, of	
	5.50	D1	N=19			5.50	116.36	Stiff arev slia	htly sandy silty CLAY. S	Sand is fine to	
F	5.50 - 5.95	5		- 👯	<u>×</u>			coarse graine	ed.		
6					<u>×</u>	(1.00)		[Lambeth Gro	publ		
					_ <u>×</u>						
E I						6.50	115.36	Dense orange	e brown clayey SAND.	With occasional	
Εl					·			gravel. Grave	el is fine to coarse, ang	ular to rounded, of	
_ 7	7.00	С	N=41					[Lambeth Gro	pup]	edium graineu.	
F											
E						(2.50)					
8						<u>-</u>					
E											
-	8.50	С	N=36								
9						9.00	112.86	Very stiff oran	nge brown sandy grave	Ily CLAY. Sand is	
								angular to rou	e grained. Gravel is fine unded, of flint, chalk an	e το coarse, sub- d quartzite.	
E								[Lambeth Gro	oup]		
	10.00		N-00	- 1.8. -	• •						
	10.00	ι.	N=39		×]			Continued of Next She	eet	
Gene	ral Remarks	I				I		Boring Progre	Cas. Depth Strike Time (m	trike Chi	selling To Duration
1) Co Scan	ntractor - Terra	Firma Ground	Investigation Lir	nited 2) A	rea (cleared with		2/12/2015 1.25 16:00:00	0.00		
0.35-	1.2m 5) Refusal	I due to boreh	ole collapsing 6)	Groundw	ater	not encoun	tered	3/12/2015 7.50 16:00:00 4/12/2015 10.50	6.00		
							0	16:00:00	0.00		

Proje	ct Name				Pro	oject No:				BOREHO	LE
Fon	tmell Close, S	t Albans					36121				
Client	t Irers of 8-11 Fo	ontmell Clo	ose & 1 Bridle C	lose a	Sta	art Date	En	d Date	$\mathbf{O}\mathbf{O}\mathbf{O}$	DUA	
HCC	ractor				Gr		115	07/12/2015	peterbrett	BHIU	1
Vari	ous						121.86m	OD			
Metho	od/Plant				Co	ordinates			Logged By: CW	Sheet 2 o	of 3
Pilco	on					515466	E	208427 N	Checked By:	Scale	1:50
(m)	Sam	ples and Insi	itu Tests	ater	Legend	Depth	Level		Stratum Description		strum tation ackfill
_	Depth	Туре	Results	5		(Thickness)	(11 00)				ja en gi
E											
-						-					
- 11 -								From 11m ora	ange brown mottled pale g	grey	
	11.50	С	N=50			5 					
						•					
- 12						- -					
						•					
-				-		(6.00)					
Ē	12.00	0	50 /0 44/50 fee			-					
- 13 -	13.00	U	165mm)			-					
						- -					
						•					
14						-					
E						• •					
-	14.50	С	N=48								
						45.00	100.00				
- 15 - -						15.00	106.86	Very dense y	ellow brown mottled orang	ge brown slightly fine grained	
								Gravel is fine	to coarse, angular to rou	nded, of flint.	
								From 15.5m	with occasional pale grey	mottleing and	
- - 16	16.00	C	N=43					fine gravel of from 16m pal	carboniferous material le grey mottled orange bro	wn	
	10.00 - 10.45	DZ				e e			<u> </u>		
-				-							
- "											
	17.50	С	N=31			(7.50)		from 17 5m d	langa aranga brawn		
Εļ									ionse orange prown		
- 18					· · · · · · · · · · · · · · · · · · ·						
					•						
						8					
- - 19	19.00	C	N=44								
E	10.00	Ũ	11-11			- -		From 19m ve	ery dense		
-				-							
- 20					<u> </u>				Continued of Next Sheet		
Gene	ral Remarks							Boring Progre	ess Water Strik	e Chisel	lling
1) Co Scan	ontractor - Terra I prior to commend	Firma Groun	d Investigation Lim Breaker from 0-0.3	nited 2) 5 4) Ha	Area cl nd dug	eared with pit from		Date/Time Depth 2/12/2015 1.25 16:00:00 3/12/2015	Cas. Depth Strike Time (mins) 0.00 6.00	Rose To From To	Duration
0.35-	1.2m 5) Refusal	aue to borel	noie collapsing 6) (Found	water n	ot encoun		16:00:00 4/12/2015 19.50 16:00:00	6.00		
·											

Project Fontm	Name nell Close, S	St Albans			Pro	oject No:	3612 [,]	1			BOR	EHOLE	_
Client Insure HCC	ers of 8-11 F	Fontmell Clo	se & 1 Bridle C	lose	and	art Date 02/12/20	En)15	d Date 07/12/2015		Orett	Bł	1101	
Contrac	tor				Gr	ound Level			-pecci				
Variou	IS (Plant				6	ordinataa	121.86m	OD	Logged By:	cw	Shee	et 3 of 3	_
Pilcor						515466	E	208427 N	Checked By:		Scale	1:50	
	San	nples and Insit	u Tests	er		Depth	l evel					E U U	
(m)	Depth	Туре	Results	Wat	Legend	(Thickness)	(m OD)		Stratum De	escription		Instru entati /Back	וםמרי
- - - - - - - - - - - - - - - - - - -	20.50	С	N=30	- - - - - - - - - -									
 22 22	22.00	С	N=27			् । - - - - - - - - - - - - - - - - - -							
						22.50	99.36		End of Boreho	le at 22.50m			
23 - 23 - 24 - 24 - 24 - 25 - 25 - 25 - 25 - 25 - 25 - 27 - 27 - 27 - 27 - 28 - 28 - 29 - 29 - 29 - 29 - 29 - 29	22 22.00 C N=27												
Genera	l Remarks					1		Boring Prog	Cas, Depth Strike	Water Strike	Rose To From	Chiselling	ion
1) Con Scan p 0.35-1.	tractor - Terra rior to comme 2m 5) Refusa	Firma Ground encement 3) B al due to boreh	d Investigation Lin reaker from 0-0.3 ole collapsing 6)	nited 2 5 4) Ha Ground) Area cl and dug dwater n	leared with pit from not encour	n CAT 0 ntered 0	2/12/2015 1.25 16:00:00 3/12/2015 7.50 16:00:00 4/12/2015 19.50 16:00:00	0.00 6.00 6.00				

Projec	t Name				Proje	ect No:					BORE	HOLE		
Font	mell Close, S	t Albans					36121	l			20112			
Client					Star	t Date	En	d Date		\sim				
Insu	rers of 8-11 Fo	ontmell Clo	se & 1 Bridle C	close and	3 t	08/12/20)15	10/12/2015			BH	102		
Contra	actor				Grou	und Level				erbrett				
Vario	ous						122.02m	OD						
Metho	od/Plant				Coo	rdinates	-	-	Logged By:	AJ/CW	Sheet	1 of 3		
Pilco	on					515456	E	208432 N	Checked By	:	Scale	1:50		
(m)	Sam	ples and Insit	u Tests	en Vater	gend	Depth	Level (m OD)		Stratun	n Description		istrum ntation sackfill		
	Depth	Туре	Results			(Thickness)	. ,	MADE GRO	UND Soft br	own slightly gr	avelly silty cla	v = = = =		
- - - - - - - - - - 1 -	1.20	С	N=2			(1.20)	120.82	Gravel is fine flint, coal, gla material. Wit cemented sa At 0.50m one At 0.80m one From 0.90 -	e to coarse, a ass, clinker a h rare pocke and, gravel an e angular col cobble of a 1.20m with fr	angualr to suba nd other anthro ts (<100 x 60 r nd anthropogen bble of concrete ngular brick (2 requent off white	ngular, of bric opogenic nm) of nic materials. e floor tile. 00 x 100 mm) e soft chalk			
2	1.20 - 1.65 2.00	D1 C	N=5			(0.90)		 And very weak low density angular grave of chark. MADE GROUND. Soft orangish brown with frequent white staining , slightly gravelly silty clay with low cobble content. Gravel is angular to rounded fine to coarse of very weak low density chalk and flint. Cobbles are nodular (<100 x 70 mm) of flint. At 2.00m fine fibres of possibly horse hair. 						
						2.10 (0.90)	119.92	;ee,						
3	3.00 3.00 - 3.45	C D2	N=9		3.00 119.02 angular to rounded, of chalk, flint and rare brick. With rare nodular flint gravel. Slight organic odour. From 2.6 - 3.0m clay is soft, dark grey with black and brown staining, with rare gravel of coal and ash. MADE GROUND. Soft brownish yellow slightly gravelly slightly sandy clay. Gravel is fine to coarse, rounded to subangular, of flint and chak with rare slate, brick and							lly to		
- - - - - - - -	4.00	с	N=2			(1.80)		slightly sandy clay. Gravel is fine to coarse, rounded to subangular, of flint and chak with rare slate, brick and glass fragments. With rare wood fragments and <u>partially decayed plant material</u> . Slight organic odour. <i>From 4.5 - 4.80m frequent wood fragments and rare</i> <i>brick fragments</i> .						
5 5 	5.00 5.00 - 5.45	C D3	N=5			4.80 (0.20) 5.00	117.22 117.02	MADE GRO sandy friable brick, chalk, slight organid MADE GRO	UND. Soft da clay. Gravel glass, charco codour UND. Very so	irk brown sligh is fine to coar bal, wood and a oft and soft bro	tly gravelly se angular of ash. With a wn, with			
	6.50 6.90	C D4	N=8			(1.90) 6.90	115.12	Frequent black clay. Gravel brick, flint an fragments ar material. Slig From 5.20m and angular From 5.50m brownish rec REWORKE	x staining, si is fine to coad d rare chalk. Ind occasiona ht organic ou clay is soft, v gravel of ver with occasio mottling. O GROUND.	Igntly gravelly rse angular to With frequent I partially deca dour. with occasional y weak low der nal orange sta Stiff brownish	slightly sandy sub-rounded wood yed plant white chalk nsity chalk. ining and rare	of		
	8.00 8.00 - 8.45	B5 C	N=18			(3.10)		REWORKED GROUND. Stiff brownish orange with grey mottling slightly gravelly silty fissured clay. Gravel is fine to coarse, angular to rounded of flint, chalk and rare sandstone. With rare black root traces. Fissures are extremely closely spaced, randomly orientated, planar smooth. From 7.50m colour is blue grey with occasional orange staining and rare iron oxide staining. At 7.90m pockets of soft black clay with frequent wood fragments.						
9 	9.50 9.50 - 9.95	D6 S	N=16			10.00	112.02	2.02 Continued of Next Sheet						
Gene	ral Remarks						·	Boring Progr	ess	Water Strike	Rono To C	hiselling		
1) Co Scan not e	ntractor - Terra I prior to commer ncountered	Firm Ground ncement. 3) H	Investigation Limi land dug pit from	ited 2) Are 0.00-1.2m	a clea ı. 4) G	red with Groundwa	CAT 08 ater 09	Jate/Time Depth 3/12/2015 8.45 16:00:00 9/12/2015 9/12/2015 17.50 16:00:00 9/12/2015 14:45:00 24.80	Cas. Depth S 7.10 8.20 8.20	trike Time (mins)	Kose To From	To Duration		
								1		· · ·				

Proje	ct Name				P	roject No:				BOREHO	DLE
Fon	tmell Close,	St Albans					36121	I			
Clien	t			<u></u>	S	tart Date	En	d Date	\mathbf{O}		
Insu	irers of 8-11	Fontmell Clo	se & 1 Bridle (Close a	and	08/12/20)15	10/12/2015	oetechcett	BH10	2
Contr	ractor				G	round Level					
Vari	ous						122.02m	OD			
Meth	od/Plant				С	oordinates			Logged By: AJ/CW	Sheet 2 d	of 3
Pilc	on					515456	E	208432 N	Checked By:	Scale	1:50
(m)	Sa	mples and Insit	u Tests	ater	Legen	Depth	Level		Stratum Description		ckfill
()	Depth	Туре	Results	Š		(Thickness)	(m OD)				Inst enta /Ba
-					×	×		Very Stiff ora With occasior	nge brown mottled pale g nal black gravel inclusions	ey silty CLAY. Gravel is fine	
E	10.50 - 11.00	B7		E	×	×		to medium, a	ngular to sub-rounded of	decomposed	
					<u>× </u>	×		[Lambeth Gro	pup]		
- - 11	11.00	с	N=35		<u>~ ×</u>	(2.00)					
_					<u>× ×</u>	~					
_					<u></u>	~					
_					<u>×_×</u>	~					
- 12					Image Image I	12.00	110.02	Donoo orong	brown mottled pale grow	ailty alayou	_
_					waiting Awaiting A Image Image I	erdal Image		sandy GRAVE	EL. Gravel is fine to coarse	e, sub-angular	
_	12.50	B8	N=38	E	Image Image I waiting Awaiting A	imu) imu)		to rounded, of arained.	f flint and quartzite. Sand	s fine to coarse	
-	12.50 - 12.95	С		-	Image Image I weating Awaiting A Image Image I	imde inde		[Lambeth Gro	pup]		
13				E	Avaiting Avaiting A Image Image I	er dal Innale Innale					
-				-	Image Image I waiting Awaiting A	ime) andi					
					Image Image I weating Awaiting A Image Image I	imde indel imde					
-				F	waiting Awaiting A Image Image I	en chi Innuti en chi					
14 	14.00	С	N=46		Image Image I waiting Awaiting A	anda andal					
-					Image Image I weating Awaiting A Image Image I	imde indel imde					
_					waiting Awaiting A Image Image I	ershi Imug					
_				E	Image Image I waiting Awaiting A	anda andal					
15				E	Image Image I weating Awaiting A Image Image I	imde indel imde					
				E	waiting Awaiting A Image Image I	ordal Image					
_	15.50	С	N=44	-	Image Image I wraiting Awaiting A	(6.90)					
					Image Image I weating Awaiting A Image Image I	imde indel imde					
— 16 -				-	waiting Awaiting A Image Image I	en chi Innuti en chi					
_					Image Image I waiting Awaiting A	ime a di					
_				Ē	Image Image I waiting Awaiting A Image Image I	ime inte					
-					waiting Awaiting A Image Image I Awaiting Awaiting A	eral Imé					
17 	17.00	C	N=36		Image Image I waiting Awaiting A	inna) arthl					
-					Image Image I waiting Awaiting A Image Image I	ardal Imag					
				Ē	Varaiting Awaiting A Image Image I Varaiting Awaiting A	en chi Inn-de en chi					
- 10				-	Image Image I webiting Awaiting A	imde Isrdel					
- 10				-	waiting Awaiting A Image Image I	andal Ismate					
Εl	18 50	С	N=25	Ē	waiting Awaiting A Image Image I waiting Awaiting A	ar sa Ismate ar sal					
E			0		Image Image I waiting Awaiting A Image Image I	imde imde					
- - 19					waiting Awaiting A	18.90	103.12	Very weak str	uctureless CHALK compo	sed of white	
E]								gravelly SILT.	Gravel is weak, low dens	ty, cream-white	
F	19.50	D9	N=9			L) F		[Lewes Nodul	ar and Seaford Chalk For	mation]	
E	19.50 - 20.00	S				ц т		⊢rom 19.3 - 1	<u>9.35m band o</u> f brown san	dy clay	
- 20	20.00 - 20.45	B10				-			Continued of Next Sheet		
								Borling Draw		OL!	lling
Gene	eral Remarks	a Firm Ground	Investigation Lim	nited 21/	Area d	eared with		Date/Time Depth	SS Water Strike	Rose To From To	Duration
Scar	n prior to comm	encement. 3) F	land dug pit from	1 0.00-1	.2m. 4)	Groundwa	ater	0/12/2010 8.45 16:00:00 17.50	8.20		
not e	encountered						1	16:00:00 0/12/2015 24.80	8.20		
								17.40.00			

Proje	ct Name				Ρ	roject No:					B	OREHO	DLE
Fon	tmell Close, S	t Albans					3612 [,]	1					
Client	t Irers of 8-11 Fi	ontmell Clo	ose & 1 Bridle C	lose	and S	tart Date	En	d Date					
HCC	; ;					08/12/20	015	10/12/2015	pete	rbrett		BH1()2
Vari					G	round Level	122 02m	00					
Metho	od/Plant				С	oordinates	122.0211	00	Logged By:	AJ/CW	S	Sheet 3	of 3
Pilc	on					515456	E	208432 N	Checked By:		Sca	ale	1:50
(m) .	Sam Depth	ples and Insi	tu Tests Results	Water	Legen	d Depth (Thickness)	Level (m OD)		Stratum	Description			Instrum entation /Backfill
_				-		Ц		From 20m	vith red brown	staining and	black sp	ecs	
	20.50 20.50 - 20.95	D11 S	N=13	-		Ľ							
21	21.00 - 21.50	B12				Ľ							
	21.50 - 21.95	U13				Ľ Ľ (4.10)							
- - - 22	21.95	D14				Ľ							
	22.50	D15	N=27	-		Ľ Ľ				_			
- - - - 23	22.50 - 22.95	S				Ľ □ 23.00	99.02	from 22.5m	weak	_			
				-		E E	00.02	Weak struct gravelly SIL with frequer	tureless CHAL T. Gravel is we nt black speach	K composed eak, low dens ks, angular. V	of crean ity crear /ith red l	n white n white prown	
						Е Е (1.90)		veining (Gra	ade Dm) Iular and Seafo	ord Chalk For	mation]		
24 	24.00 - 24.45	U16	N-20			Е Е							
	24.45 24.45 - 24.90	D18 S	N=20			Ľ Ľ 24.90	97 12						
25 				-		21.00	01.12		End of Bore	ehole at 24.90m			
				-									
26 													
				-									
27 													
- 28 				-									
-				-									
29 2													
- 30				-									
Gene	ral Remarks							Boring Prog	ress	Water Strike	Porce T-	Chis	elling
1) Co Scan not e	ontractor - Terra prior to comment ncountered	Firm Ground ncement. 3) I	Investigation Limit Hand dug pit from	ted 2) 0.00-1	Area cl .2m. 4	eared with) Groundwa	CAT 0 ater 0	Jack/Innie Deptf 8/12/2015 8.45 16:00:00 9/12/2015 16:00:00 0/12/2015 0/12/2015 24.80 14:45:00 14:45:00	Cas. Depth Sti 7.10 8.20 8.20 8.20		KUSE IO		
L							I						

Proje	ct Name				P	roject No:					BORE	ЕНО	LE
Fon	tmell Close, S	t Albans					36121	I					
Client	t				s	tart Date	En	d Date					
Insu HCC	rers of 8-11 Fo	ontmell Clo	se & 1 Bridle (Close a	and	11/12/20)15	17/12/2015	peterbre	tt	BH	10:	3
Contr	actor				G	Fround Level	404 00	0.0					
Vario	ous				0	oordinatos	121.98m	OD	Logged By: C	w	Shee	t 1 o	f4
Pilce	on					515445	Е	208425 N	Checked By:		Scale	1	:50
(m)	Sam	ples and Insit	u Tests	ater	Legen	Depth	Level		Stratum Descript	tion			rum ation ckfill
(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Depth	Туре	Results	Ň		(Thickness)	(m OD)	Torresonations					Inst enta /Ba
						(0.25)	121.88	Concrete				/	
				-		0.35 (0.25)	121.63	MADE GROU	IND: Black slightly cla	ayey sli	ghtly sandy		
_						0.60	121.38	coarse, angul	is fine to coarse grain ar to rounded, of bric	ned. Gra ck, flint,	chalk and	to	
- 1				-		(0.70)			IND: Brown slightly s	andy ar			
						1 30	120.68	Sand is fine to	coarse grained. Gra	avel is fi	ine to coars	se,	
_								Angular to rou MADE GROU	Inded, of bricks, chall IND [.] Very loose blac	lk and fli ck fine a	int sh with	/	
						8		frequent grav	el, fine to coarse, ang	gular to	rounded, o	f	
- 2	2.00	С	N=2	-		8		brick, flint, gla	iss and metal. Slight	organic	odour.		
						8							
_						8							
-				-		8							
3	3.00	С	N=5			8		From 3.0m Lo	ose				
_				-		8							
						8							
-						×							
_ 4	4.00	С	N=5	-		×							
-				-		× (6.20)							
						(6.20)		From 4.5m wi	th occasional concre	ete grave	el		
						8				-			
5	5.00 5.00 - 5.45	C D1	N=13			8							
	5.00 - 5.45	DI				8							
-				-		8							
						8							
- 6				-		8							
				Ē		×							
	6.50	С	N=6			8							
-				-		×							
- 7						8							
Εl						7 50	114 40						
F				Ē	×	A 7.50	114.40	Stiff orange b	rown slightly sandy g	gravelly avel is fi	silty CLAY.		
	8 00	C I	N=17			× (1.00)		sub-angular to	s sub-rounded of flint	it		<i></i> ,	
- °	8.00 - 8.45	D2	IN-17		<u> </u>	(1.00) 		[Lambeth Gro	pup]				
Εl	8 50	D3		Ē	<u> </u>	∴ ≚ 8.50	113 48						
F	0.00			F I	<u>×</u> _		110.40	Stiff orange b CLAY, Sand is	rown mottled yellow g	grey sai ned. With	ndy silty	al	
E 9				Ē	×	 ≍ (0.90)		gravel, fine to	coarse, sub-angular	r to roun	ded, of flin	t	
ΕÌ				E	×				սսիլ				
F	9.50	B4	N=23		×	9.40	112.58	Stiff orange b	rown slightly gravelly	y sandy	silty CLAY.		
Εl	9.50 - 9.95	С		È	× 	(0.60)		Sand is fine to	coarse grained. Gra	avel is fi	ine to coars	se, k	
- 10					X	10.00	111.98		Continued of Nevt S	Sheet			
								Barling Dec.		r Ctaile -		7 h!!!	ina
Gene	ral Remarks	Firma Groups	Investigation Li	mited 2	Area	cleared by (Date/Time Depth	SS VVater Cas. Depth Strike Time	(mins) Ro	ose To From	To	Duration
Scan	prior to commer	ncement 3) B	reaker from 0-0.3	35m 4) I	Hand c	lug to 1.2m	5)	16:00:00 5/12/2015 9.00 5/12/2015 14.50					
Grou	indwater not enc	ountered					1	16:00:00 6/12/2015 28.00					
								10.00.00					

Projec	t Name	t Albans			Pro	oject No:	36121			BOREHO	LE		
Client	rers of 8-11 F		ose & 1 Bridle Cl	050 30	Sta	art Date	En	d Date	$\mathbf{o}\mathbf{o}\mathbf{o}$		-		
HCC					Gr	11/12/20)15	17/12/2015	peterbrett	BH10	3		
Varie	ous					, ound Level	121.98m	OD					
Metho	od/Plant				Со	ordinates			Logged By: CW	Sheet 2 o	f 4		
Pilco	on					515445	E	208425 N	Checked By:	Scale 2	1:50		
(m)	Sam Depth	ples and Ins	itu Tests Results	Mater BJ	gend	Depth (Thickness)	Level (m OD)		Stratum Description		Instrum entation Backfill		
_		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		- 2				mottling	laur				
- 11 - 11 - 12	11.00 11.00 - 13.00	B5 C	N=50			(1.00)	 110.98 110.98						
 13 	12.50	С	50 (7,9/50 for 215mm)		(4.40)								
14 14 	14.00	С	50 (25 for 105mm/50 for 115mm)		× × × × × × × × × × × × × × × × × × ×								
15 	15.50 15.50 - 15.95	D6 S	50 (6,17/50 for 165mm)	X X X	Amating Amat Image Ima Javating Ama Image Ima Javating Ama Image Ima Javating Ama Image Ima Javating Ama	15.40	106.58	 Very dense pale grey mottled orange gravelly silty clayey SAND. Gravel is fine to coarse, angular to rounded, of flint and quartzite. Sand is fine to coarse grained. [Lambeth Group] 					
17 17 17 17 17 17 17 17 17 17 17 17 17 17	17.00 17.00 - 17.45	D7 S	N=35	Avaitin image Avaitin image Avaitin image Avaitin image Avaitin image Avaitin image Avaitin image	Image Imi g Awaiting Awai g Awaiting Awai g Awaiting Awaiting Awai Image Imi g Awaiting Awai Image Imi g Awaiting Awai Image Imi g Awaiting Awai Image Imi g Awaiting Awai Image Imi	(5.40)		[Lambeth Group]					
- 18 - 18 - 19 - 19 - 19 	18.50 18.50 - 18.95	D8 S	N=50	Austin Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra Austra	y Awaiting A			From 19 - 19.	.3m grey				
20	20.00 20.00 - 20.45	D9 S	N=46	Availin Image Availin	g Awaiting Awa Image Ima g Awaiting Awa Image Ima			Boring Drogen	Continued of Next Sheet		ling		
Gene 1) Co Scan Grou	ral Remarks ontractor - Terra I prior to commer ndwater not enco	Firma Grour ncement 3) ountered	nd Investigation Limi Breaker from 0-0.35	ted 2) A m 4) Ha	rea cl nd du	leared by (ug to 1.2m	CAT 1 5) 1	boring Progres Date/Time Depth 1/12/2015 9.00 16:00:00 5/12/2015 5/12/2015 14.50 16:00:00 6/12/2015 6/12/2015 28.00 16:00:00 6/12/2015	SS Water Stril	Rose To From To	Duration		

Proje	ct Name				Project No:				BOREHO	DLE
Fon	tmell Close, S	t Albans				3612 [,]	1			
Clien	t				Start Date	En	d Date			
Insu	rers of 8-11 Fo	ontmell Clo	ose & 1 Bridle C	lose and	11/12/20	015	17/12/2015	octochcett	BH10	3
Contr	actor				Ground Level					
Vari	ous					121.98m	OD			
Meth	od/Plant				Coordinates			Logged By: CW	Sheet 3 c	of 4
Pilc	on				515445	δE	208425 N	Checked By:	Scale	1:50
()	Sam	ples and Insi	tu Tests	te .	Depth	Level				tion kfill
(m)	Depth	Туре	Results	_ ≈ Leg	(Thickness)	(m OD)		Stratum Description		Insti enta /Bac
	Depth 21.50 21.50 - 21.95 23.00 24.50 24.50 26.00 26.00 - 26.45 27.50 - 27.95	Type B10 C C D11 S U12 D12	Results 50 (7,8/50 for 150mm) N=50 N=30 N=26		(4.90) 25.70	96.28	From 20m gr	rown with pale grey and or y slightly gravelly SILT and and is fine to coarse graine gular to rounded, of flint. Dup]	ange mottling CLAY. Thinly d. Gravel is fine	In the second
29 29 30 30 Gene	29.00 - 29.45 29.50 29.50 - 29.95 ral Remarks	B14 D15 S	N=10		a cleared by	CAT	From 29.5 - 3	30.8m chalk is very soft and Continued of Next Sheet Cas. Depth Strike Time (mins)	d wet.	Iling Duration
1) Co Scar Grou	pritractor - Terra l prior to commer indwater not enc	rrma Groun ncement 3) E ountered	a investigation Lin Breaker from 0-0.3	5m 4) Han	ea cleared by d dug to 1.2m	CAI 1 15) 1 1	1/12/2015 9.00 16:00:00 5/12/2015 14:50 14.50 16:00:00 6/12/2015 28.00 16:00:00			

Proje	ct Name				Project No:				BOREH	OLE
Fon	tmell Close, S	t Albans				3612	1			
Clien	t				Start Date	Er	nd Date			
HCC	irers of 8-11 F	ontmell Clo	ose & 1 Bridle C	lose and	11/12/	2015	17/12/2015	oeterbrett	BH10)3
Contr	actor				Ground Lev	el				
Vari	ous					121.98m	OD		Shoot 4	of 4
Metho	od/Plant				Coordinates	; 	000 /0 7 N		Sheet 4	4 50
Pilc	on			1 1	51544	15 E	208425 N	Checked By:	Scale	1:50
(m)	Sam	ples and Insi	itu Tests	Leg	end Depth	Level		Stratum Description	ı	strum tatior ackfil
	Depth	Туре	Results		(Thicknes	is) (III OD)	From 30.0 -	30 5m red brown mottled	grev clav band	lns /B
-							thinly lamina	ted	g. cy o. cy z c c,	
_										
_				E H						
— 31 -	31.00 31.00 - 31.45	D16 S	N=24							
_					31 45	00.53				
_					51.45	90.55		End of Borehole at 31.45	m	
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							Boring Des	Mater Of		ollina
Gene	eral Remarks	Firma Groun	d Investigation Lim	ited 2) Are	a cleared h		Date/Time Depth	Cas. Depth Strike Time (min	s) Rose To From	To Duration
Scan	prior to comme	ncement 3) E	Breaker from 0-0.35	im 4) Han	d dug to 1.2	m 5)	16:00:00 5/12/2015 14.50			
Grou	nuwater not enc	ountered				1	16:00:00 6/12/2015 28.00 16:00:00			

Projec	t Name						I	Project No:				ROTARY H	
Font	mell Close. S					-	3612	1		NOTART II			
Client								Start Date	Fn	d Date			
Insu	rers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose a	ind	07/12/20		08/12/2015		BH20	1
HCC	actor								,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	00/12/2010	peterbrett	DIIZU	•
Contra							ľ	Slound Level	404 00	00			
vario	bus								121.06M	00	Logged By:	Sheet 1 o	of 2
Metho	d/Plant						ľ		_				
C6								515455		208426 N	Checked By:	Scale 1	1:100
(m)	Sam	ples and Ins	itu Test	ts		ater	Leaeı	Depth	Level		Stratum Description		ation
	Depth	Type/FI	TCR	SCR	RQD	ŝ		(Thickness)	(m OD)				Ins ent /Ba
Ē						E		소		Concrete			
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Ē						E		(3.00)					
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						Ē		2 00	110.00				
								3.00	118.06	Firm Ashy Fil	I		
Ē								(1.00)					
4								4.00	117.06	Loose Ash Fi	II		
Ē								8					
5								8					
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6								× í					
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7								8					
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8						E					City		
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9						Ē		(2.50)					
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E 10						E		10.00	111.06	Coff to firms I	abtte deal bassing equal		
Ē						Ē					ight to dark brown sand		
E 11						E							
El						E							
E 12						E I							
ĒĪ						E							
						E							
ĒĨ						Ē		(6.80)					
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14						E							
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15						Ē							
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16						Ē							
Ē								16.80	104.26				
17								(0.40)	103.86	Gravel, flint,	very hard drilling		
E						Ē					Sanu		
- 18						Ē		(1.80)					
						Ē							
19						Ē		19.00	102.06	Soft Chalk			
EI						Ē				-			
E 20					1	F	11-11	_			Continued of Next Sheet		
										Baring Des	341-1		- Dum
Gener	rai Remarks	re limited 2)	BVOL		ייוסח	בספי	000			Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Base	e Dia.
at 11	degrees	as Linited 2)	DASE	NO UN	URILL	ers l	.065	UNLT 3) D	IIIEU				
-		-					-						

Project	Name						F	Project No:						RC	TAR	ү но	DLE
Fontm	nell Close, S	t Albans							3612 ⁻	1							
Client							. 5	Start Date	En	d Date							
Insure	ers of 8-11 F	ontmell Clo	ose &	1 Brid	die Ci	ose a	nd	07/12/20	015	08/12/20	15	oeter	brett		BH	201	
Contrac	tor						C	Ground Level				Petter	orecc				
Variou	IS								121.06m	OD					NI 4	0 - 1	0
Method/	/Plant						C	Coordinates				Logged By:			sneet	2 01	2
C6						<u> </u>		515455	5 E	208426	Ν	Checked By:		Sc	ale	1:'	100
(m)	Sam	ples and Insi	itu Test	s		Vater	.eger	Depth nd	Level (m OD)			Stratum D	escription				strum itatior ackfil
=	Depth	Type/FI	TCR	SCR	RQD	= _	1	(Thickness)	(la B
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23								」 (7.00)									
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26								26.00	95.06			End of Borebo	le at 26.00m				
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Genera 1) Cont	i Remarks tractor - Forke	rs Limited 2)	BASF	D ON I	DRILL	ERSL	OGS	ONLY 3) D	rilled	Date/Time	Depth	Cas. Depth Strike	Time (min)	Rose to	Тор	Base	Dia.
at 11 d	egrees)						-, -									
																	1

Project	Name						F	Project No:							R	DTAR	Ү НС	DLE
Fontn	nell Close, S	t Albans							3612 ⁻	1								
Client	ore of 8-11 E	ontmoll Cl	2008	1 Brid		060 3	end 8	Start Date	En	d Date								
HCC			536 Q			036 8		09/12/20)15	10/12/2	015		etert	rett		BH	202	
Contrac	ctor						(Ground Level										
Vario	US							De endimente e	121.02m	OD		Logged	Bv [.]			Sheet	1 of	2
	Plant						(515453	F	20842	4 N	Checker	l Bv		50	ale	1.	- 100
	Sam	nlos and Ins	itu Toet			2		Donth	-	200-12-		Chicolice					·.	ε5≣
(m)	Depth	Type/FI	TCR	SCR	ROD	Wate	Leger	nd (Thickness)	Level (m OD)			Stra	itum Des	scription				nstru entatio Backf
E		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				E .				Concre	ete							- • <
								(0.00)										
E'I						E		(2.00)										
2							****	2.00	119.02									
								×		Black	ashy fill							
3								8										
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4								8										
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5								(1 20)		Damp	black c	lay fill						
								(1.20)	115.00									
						ĒĒ			115.02	Brown	ı clay, gı	ritty chal	k					
7																		
								(2.30)										
8																		
								8.30	112.72	Sandy	Gravel							
9							•											
10								(3.70)										
ĒÏ																		
12								12.00	109.02	- Firme O		1						
										Firm S	sandy C	lay						
13								(2.00)										
14								14.00	107.02	Light b	prown S	andy Cla	ау					
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15								15.00	106.02	Firm S	Sandy C	lay						
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18								·골 ·길										
19																		
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20						F ľ						Cont	inued of N	lext Sheet				
Genera	I Remarks	L	1	1	1	1				Boring	g Progre	SS Cas. Denth	\ Strike	Nater Strik	Rose to	Top	oring R	Dia
1) Con at 20 c	tractor - Forke legrees	ers Limited 2)	BASE	D ON	DRILL	ERS L	.OGS	ONLY 3) D	rilled									
	J																	

Project	Name						Ρ	roject No:				ROTA	у но) F
Fontm	nell Close. S	St Albans						-	3612	1			1110	
Client							S	tart Date	En	d Date				
Insure	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose ar	nd	09/12/20)15	10/12/2015		BH	1202)
HCC Contrac	tor						G	round Level						•
Vario	16								121 02m	OD				
Method	/Plant						C	oordinates	121.0211	00	Logged By:	Shee	et 2 of	2
C6							Ũ	515453	Е	208424 N	Checked By:	Scale	1:1	100
	Sam	ples and Insi	itu Test	s		-		Depth	Lovol					토 등 🗒
(m)	Depth	Type/FI	TCR	SCR	RQD	_ Nat	egen	d (Thickness)	(m OD)		Stratum Descriptio	on		Instri entat /Bach
								-						
								22.00	99.02	Sandy Grav	vel, flint, clay			
23														
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24								(4.50)						
25								*						
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26								- -						
						ĒË	T T	26.50 (0.50)	94.52	Sandy Cha	k			
27						目目	T	27.00	94.02	Firm Chalk				
28								Ľ						
								(3.00)						
29						ΕĽ		Е						
						ΕĽ		Ľ						
30						ΕH	<u> </u>	30.00	91.02		End of Borehole at 30.0)0m		
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Genoro	Romarke									Boring Prog	ress Water S	Strike	Corina R	un
1) Con	tractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LO	OGS	ONLY 3) Di	rilled	Date/Time Depti	Cas. Depth Strike Time (n	nin) Rose to Top	Base	Dia.
at 20 d	egrees	,						-,-						

Projec Font	t Name mell Close, S	t Albans					1	Project No:	3612 [,]	1		ROTARY I	HOLE
Client Insu	rers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose ar	nd	Start Date	En	d Date		рцэ(12
HCC	actor						_	Ground Level	515	15/12/2015	peterbrett	DUT	13
Vario	ous								120.92m	OD			
Metho	od/Plant							Coordinates		-	Logged By:	Sheet 1	of 2
C6								515453	E	208422 N	Checked By:	Scale	1:100
(m)	Sam Depth	ples and Insi	itu Test	ts SCR	RQD	Vater T	ege	nd (Thickness)	Level (m OD)		Stratum Description		Instrum entation Backfill
E		.,,								Concrete			- • <
Ē													
								(3.10)					
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3								3.10	117.82	Black Ash a	nd Gravel		
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4						Ē		8					
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5						Ē		(4.40)					
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6						Ē		8					
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- 20							<u></u>	<u></u>			Continued of Next Sheet		
Gene	ral Remarks									Boring Proa	ress Water Strike	Corin	g Run
1) Co	ntractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LO	OGS	SONLY 3) D	rilled	Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Ba	ise Dia.
at 27	degrees	,						,					

Project	Name						Pro	oject No:				ROTARY H	OLE
Fontn	nell Close, S	t Albans							36121	l		KOTAKI II	
Client	,						Sta	art Date	En	d Date			
Insure	ers of 8-11 F	ontmell Clo	ose &	1 Bri	lle Cl	ose an	d	15/12/20	015	15/12/2015		BH20	3
Contrac	tor						Gr	ound Level					•
Vario	us								120.92m	OD			
Method	/Plant						Co	ordinates			Logged By:	Sheet 2 o	f 2
C6								515453	E	208422 N	Checked By:	Scale 1	·100
	Com		4 To of			<u>ب</u>		Denth	_		,		£5≣
(m)	Donth				BOD	La Vate	gend	(Thiskness)	Level (m OD)		Stratum Description		nstru ntatio Backf
=	Deptil	турелт	ICK	JUK	RQD		-	(Thickness)					e li
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22							<u> </u>						
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28							<u></u> 0-	27.80	93.12	Hard Flint			
Ē								28.30	92.62	Sand and G	ravel		-
20													
								(2.40)					
								(2.40)					
								30.70	90.22	Chalk			
31								(1.30)					
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32						Ē		32.00	00.92		End of Borehole at 32.00m		
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- 40						F							
Genera	Remarke									Boring Prog	ress Water Strike	Corina	Run
1) Con	tractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LO	GS C	ONLY 3) Di	rilled	Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Base	e Dia.
at 27 d	legrees	,						,					

Projec	t Name						F	Project No:				ROTARY	HOLE
Font	mell Close, S	t Albans							36121	l			
Client							5	Start Date	En	d Date			
Insu	rers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose ai	nd	17/12/20)15	17/12/2015		BH20)4
Contra	actor							Ground Level					-
Vario	ous								121.14m	OD			
Metho	od/Plant							Coordinates			Logged By:	Sheet 1	of 2
C6								515455	F	208421 N	Checked By:	Scale	1.100
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(m)	Sam	ples and Insi	tu Test	ts		l atei	egei	nd Depth	Level (m OD)		Stratum Description		strun itatio ackfi
_	Depth	Type/FI	TCR	SCR	RQD	- :	e Ne N	(Thickness)	(02)	Concrete			ln /B
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								3.00	118 14				
Ē						E 🕅				Black fill			
E .I						E 🕅		8					
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5						Ē		(4.50)					
Ē						Ē		8					
6						Ē		8					
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7						Ē		8					
						EX	****	7.50	113.64	Sandy Grav	el, flint, trace clay, firm		
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	al Demail :									Boring Prog	nese Mater Strika	Corin	a Run
	nai Remarks	rs imited 2)	BASE		DRILL	FRSI	୨୦୦	ONI Y מער		Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Ba	se Dia.
at 30	degrees	. o Emiliou Z)	DAUE										

Project	Name						Pr	oject No:					ROTA	RY HO	DLE
Fontn	nell Close, S	St Albans							3612						
Client	ers of 8-11 F	Fontmell Cl	ose &	1 Bri	dle Cl	ose an	d St	art Date	En	d Date			RF	120/	
HCC Contrac	tor						Gr	ound Level				orett		1207	r
Variou	JS								121.14m	OD					
Method	/Plant						Co	ordinates			Logged By:		Shee	et 2 of	2
C6						<u> </u>		515455	E	208421 N	Checked By:		Scale	1:	100
(m)	Sar	nples and Ins	itu Test	ts	BOD	Nater 91	egenc	Depth	Level (m OD)		Stratum De	scription			nstrum ntation Backfil
Ē	Deptil	туре/гі	ICK	JUK	RQD			(Thickness)							e E
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29						╞╞		29.00	92.14	Chalk					
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31								(5.00)							
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34							P. 1	34.00	87.14		End of Borehol	e at 34.00m			
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37															
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40															
Genera	l Remarks	1	1	1	1			1		Boring Prog	Cas. Depth Strike	Water Strike	Rose to Top	Coring F	Run
1) Con at 30 d	tractor - Forke egrees	ers Limited 2)	BASE	D ON	DRILL	ERS LO	GS (ONLY 3) Di	rilled				iop		
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Project	Name						Pr	roject No:				ROTAR	Y HOLE
Fontr	nell Close, S	St Albans							36121	l			
Client Insur HCC	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose an	d St	tart Date 07/01/20	En) 16	d Date 07/01/2016		BH2	205
Contra	ctor						G	round Level					
Vario	us								121.15m	OD	- I accord Dur	Cheat	1 of 0
Method	l/Plant						C	oordinates	E	208420 N	Checked By:	Scalo	1.100
	Son	anles and Insi				<u>ب</u>		Denth	-	200420 1	Checked by.	Julie	1.100 E 5.≣
(m)	Depth	Type/FI	TCR	SCR	RQD	A ate	geno	d (Thickness)	(m OD)		Stratum Description		Instru entatio Backf
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Ē								1 1					
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3													
						E 🐹		3.50	117.65	Black ashy fi	ill, damp		
4						F 🕅		8		-			
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5						E 🕅		(2.50)					
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7							<u> </u>	7.00	114.15	Sand Crove			
										Sanu, Grave	i, Clay		
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Ē 20							_, _,	***			Continued of Next Sheet		
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Genera	al Remarks		D 4 0 5				~ ~			Boring Progr Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top	ring Run Base Dia.
1) Cor 22 dec	າແactor - ⊢orke grees	ers Limited 2)	RASE	U UN	URILL	EKS LO	G Ü	INLY 3) Dril	ied at				
	-												

Project	Name						P	Project No:				ROTAR	(HOLE
Fontn	nell Close, S	St Albans							3612 ⁻	1			
Client Insure HCC	ers of 8-11 F	Fontmell Cl	ose &	1 Bri	dle Cl	ose an	d	Start Date 07/01/20	En)16	id Date 07/01/2016		BH2	205
Contrac	tor						Ģ	Bround Level					
Variou	US (Diant								121.15m	OD	Logged By:	Sheet	2 of 2
C6	Plant							515455	E	208420 N	Checked By:	Scale	1:100
	Sar	nples and Ins	itu Test	ts		Ler .		Depth	Level				tiin m
(m)	Depth	Type/FI	TCR	SCR	RQD	S Le	gen	(Thickness)	(m OD)		Stratum Description		Instr entat /Bacl
							 	20.50	100.65	Light grov of	alk clay flint firm		
21							r T	ľ			laik, olay, iiitt, iirtti		
							r¦-	T (2.50)					
22								ľ					
23								⊥ ≖ 23.00	98.15				
							r r	т Т		Clay, Chalk	traces, small gravel		
24							r,	T					
							r' r	⊥ (3.00)					
25							r pr	<u> </u>					
						Ē	^r		05.45				
26							r,	26.00 ⊥	95.15	Pale chalk, s	small grey patches		
27							r¦-	工 (2.00)					
							r' T	T ´´					
28						ĒĒ	r p	28.00	93.15	Firm matt wi	hite chalk, flint parts		
							r T	ľ					
29								Ľ					
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31							r p	上 〒 (6.00)					
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36													
- 3/													
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=39 													
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Genera	I Remarks	1	1	1	1					Boring Progr	Cas. Depth Strike Time (min)	Rose to Top	ring Run Base Dia
1) Con 22 deg	tractor - Forke rees	ers Limited 2)	BASE	D ON	DRILL	ERS LO	G C	NLY 3) Dril	led at				Did.

Projec	t Name						Pro	ject No:				ROTARY H	OLE
Font	mell Close, S	t Albans							36121	l			
Client							Sta	rt Date	En	d Date			
Insu	ers of 8-11 F	ontmell Clo	ose &	1 Brie	dle Cl	ose and	k	07/01/20	16	07/01/2016		BH20	6
Contra	ctor						Gro	ound Level					
Vario	ous								121.18m	OD			
Metho	d/Plant						Co	ordinates			Logged By:	Sheet 1 o	f 2
C6								515456	Е	208420 N	Checked By:	Scale 1	:100
	Sam	ples and Insi	itu Test	s		e		Depth					E G E
(m)	Depth	Type/Fl	TCR	SCR	RQD	Le A	gend	(Thickness)	(m OD)		Stratum Description		Instru entat /Bacl
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Ē													
Ē								(3.50)					
2													
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Ē								3.50	117.68	Damp Muddy	/ Ash Fill		
4													
E						E 🕅							
5						E 🗱		(3.00)					
E						F 🕅							
6						E 🕅							
Ē						E 🕅		6.50	114.68	Light Drown (Cond. Croyal		-
7											Sanu, Graver		
E I								(1.50)					
E al								8.00	113.18				_
Ē										Sand Gravel,	, Hard, Firm		
9													
Ē													
10 E								(4.50)					
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E 11													
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E 12													
Ē								12.50	108.68	Stiff Brown C	lay Gravel		
13													
Ē							- -	(2.50)					
14							<u> </u>	(
E							<u> </u>						
E 15							<u> </u>	15.00	106.18	Light Brown (Grev Sand Gravel Chalk	Traces	
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16								(0.50)					
E								(2.50)					
17													
E							-	17.50	103.68				-
18						ĒĒ				Firm Pale Wr	nite Chaik, Small Flint Parts	5	
Ē													
E 19						ĒĒ							
ΕΊ													
						e F							
20											Continued of Next Sheet		
Gener	al Remarks		ı	I		ıl		I		Boring Progre	ess Water Strike	Coring	Run
1) Co	ntractor - Forke	rs Limited 2)	BASE	D ON	DRILLI	ERS LO	G ON	ILY 3) Dril	led at			I IOP Base	- Dia.
∠o de	grees												
L													

Project	Name						P	roject No:						RC	TARY	′ НО	LE
Fontm	nell Close, S	St Albans							3612	1							
Client Insure HCC	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose a	nd	tart Date 07/01/20	E1 016	nd Date 07/01/2016			Orett		BH2	206	
Contrac	tor						G	round Level									
Variou	JS /Dignt							oordinatoo	121.18n	n OD	Logged	Bv:		6	Sheet	2 of 2	2
C6	Plant							515456	E	208420 N	Checked	d By:		Sc	ale	1:1	00
(m)	Sam	ples and Insi	tu Test	s		ater	Legen	Depth	Level		Stra	atum Des	cription			trim mint	ation ackfill
_	Depth	Type/FI	TCR	SCR	RQD	3	-	(Thickness)	(11 00)							<u> </u>	ent Ba
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30								(22.50)									
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E 40						F F	r r	40.00	81.18		End o	f Borehole	at 40.00m				
Ca = 0	Demonia									Boring Proc	Irese	1	Nater Strik	٥	C ~	ring P.	un
Genera 1) Con	remarks tractor - Forke	ers Limited 2)	BASF	D ON	DRILI	ERSI	.0G ()	NLY 3) Dril	led at	Date/Time Dept	h Cas. Depth	Strike	Time (min)	Rose to	Тор	Base	Dia.
25 deg	rees							., _ /									
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Projec	t Name						Pr	oject No:				ROTARY H	OLE
Font	mell Close, S	t Albans							3612	1			
Client							. St	art Date	En	d Date			
Insu HCC	rers of 8-11 F	ontmell Clo	ose &	1 Bri	die Ci	ose an	d	11/01/20	016	11/01/2016	oetechcett	BH20	7
Contra	octor						G	round Level					
Vario	ous								121.19m	OD			
Metho	d/Plant						Co	oordinates			Logged By:	Sheet 1 o	f 2
C6								515456	E	208420 N	Checked By:	Scale 1	:100
()	Sam	ples and Insi	itu Test	ts		ter		Depth	Level		Otractione Desceriation		tion
(11)	Depth	Type/FI	TCR	SCR	RQD	A Sa	gend	(Thickness)	(m OD)		Stratum Description		Insti enta /Bac
E										Concrete			
E 'I													
								(3.50)					
Ē								3 50	117 69				_
4						E		0.00	117.00	Black Ash, M	uddy Fill		
						E 🕅							
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								1.00	110.00	Soft Brown S	and		
								(1.50)					
								9.00	112 19				
								3.00	112.13	Hard, Firm S	and, Gravel		
= 10													
								(3.00)					
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ΕÏ													
E 12								12 00	109 19				-
Ē										Light Brown	Clay, Soft Sand		
E 13													
								(3.00)					
14								· · · · · · · · · · · · · · · · · · ·					
ΕÏ													
15								15.00	106.19				
ĒĨ										Firm Hard Cl	ay, Sand		
16								(1.50)					
ĒĨ								16.50	104.69		0 110		
E 17							╹╷╹			Sandy Chalk	, Small Gravel		
ĒÌ						É F	Τ	(1.50)					
18								18.00	103.19				
ĒÌ										Firm Chalk, S	small flint in places		
19						Ē	r I						
El					1	ĒĒ							
E 20						Ę Ē		1			Continued of New Ober		
											Continued of Next Sheet		
Gener	al Remarks								Ē	Boring Progree	Cas. Depth Strike Time (min)	Rose to Top Base	Run e Dia.
1) Co 20 de	ntractor - Forke grees	ers Limited 2)	BASE	U ON	URILL	EKS LC	GO	NLY 3) Dril	ied at				
	-												

Project	Name						Pi	roject No:						RC	TAR	(НО	LE
Fontm	nell Close, S	St Albans							3612	1							
Client Insure HCC	ers of 8-11 F	ontmell Clo	ose &	1 Brie	dle Cl	ose a	nd	art Date 11/01/20	Er 016	nd Date 11/01/2016					BH2	207	
Contrac	tor						G	round Level									
Variou	IS								121.19m	n OD	Loggod	By:			Shoot	2 of '	2
Method	/Plant						C	oordinates	F	208420 N	Checker	Dy. I By:		Sc	ala	2 01 2 1 · 1	<u>^</u>
	Sam	nles and Insi	itu Tost			5		Denth	· -	20042011	Onconce	. by.		00		1.1	500 151
(m)	Depth	Type/FI	TCR	SCR	RQD	Wat	_egend	d (Thickness)	(m OD)		Stra	itum Des	cription			lactr.	entati /Back
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= 30								(22.00)									
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<u> </u>						╞╞	r r	40.00	81.19		End o	f Borehole	at 40.00m				
0.000	Demonia									Boring Prov			Nater Strik	٥	00	ring P.	In
1) Con	tractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS L	OG O	NLY 3) Dril	led at	Date/Time Dept	th Cas. Depth	Strike	Time (min)	Rose to	Тор	Base	Dia.
20 deg	rees	,															

Projec	t Name						P	roject No:				ROTARY HOLE
Font	mell Close, S	t Albans							36121	l		KORAKTHOLE
Client							S	tart Date	En	d Date		
Insu	rers of 8-11 F	ontmell Clo	ose &	1 Brid	dle Cl	ose and	ł	11/12/20	15	14/12/2015		BH208
HCC	ator						-		15	14/12/2013	peterbrett	DIIZUU
Contra	actor						G	round Level				
Vario	bus								121.05m	OD		Shoot 1 of 2
Metho	d/Plant						С	oordinates			Logged By:	Sheet 1 01 3
C6								515455	E	208422 N	Checked By:	Scale 1:100
	Sam	ples and Insi	tu Test	s		te .		Depth	Level			Ĕ Ũ Ĩ
(m)	Depth	Type/FI	TCR	SCR	RQD	S Le	gen	d (Thickness)	(m OD)		Stratum Description	Instr Bac
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Ē								김				
2								(3.70)				
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3												
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El						e 🖮		3.70	117.35	Black ashy, st	tone, muddy clays fill	
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E 12						Ē		×.				
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13								13.00	108.05	Very soft blac	k damp fill	
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- 20						⊨ ⁸⁸⁸	****	×			Continued of Next Sheet	
G	rol Domonic-									Boring Progra	SS Water Strik	re Coring Run
1) Co	ntractor - Forke	rs Limited 21	BASE		DRILLI	ERSIO	GS	יס (ONLY 3	rilled	ate/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Base Dia.
vertic	ally		2,000									

Project	Name						Proj	ect No:				ROTARY H	IOLE
Fontn	nell Close, S	t Albans					36121 Start Date End Date						
Client							Star	t Date	En	d Date			
HCC	ers of 8-11 F	ontmell Cic	ose &	1 Brid		ose and	<u>،</u>	11/12/20	15	14/12/2015	oeterbrett	BH20	8
Contrac	ctor						Grou	und Level					
Variou	us								121.05m	OD	Loggod Dyr	Shoot 2	.f 2
Method	/Plant						Coo	rdinates	_			Sheet 2 t	
C6								515455	E	208422 N	Checked By:	Scale	1:100
(m)	Sam	ples and Insi	itu Test	s		ater Jater	gend	Depth	Level (m OD)		Stratum Description	n	strum tatior ackfil
	Depth	Type/FI	TCR	SCR	RQD	5	××××	(Thickness)	(00)				B B
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34						E E		34.00	87.05	Sandy clayey	gravel, soft drilling		
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35													
36													
E													
37								(10.10)					
E													
38													
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د م الا													
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40											Continued of Next Shee	et	
Genera	I Remarks		1	1	I		L			Boring Progre	ss Water St	rike Coring	g Run
1) Con	tractor - Forke	ers Limited 2)	BASE	D ON I	DRILLI	ERS LOO	GS ON	NLY 3) Dr	illed	ate/Time Depth	Cas. Depth Strike Time (mi	n) Rose to Top Ba	se Dia.
vertica	lly												
L													

Project	Name						Pro	oject No:				ROTARY H	OI F
Fontr	nell Close, S	t Albans					36121 Start Date End Date					Ronald I	OLL
Client	•						Sta	art Date	En	d Date			
Insur	ers of 8-11 F	ontmell Clo	ose &	1 Brie	dle Cl	ose and	ł	11/12/20	015	14/12/2015		BH20	8
Contra	ctor						Gr	ound Level					•
Vario	us								121.05m	OD			
Method	I/Plant						Со	ordinates			Logged By:	Sheet 3 c	of 3
C6								515455	E	208422 N	Checked By:	Scale 1	:100
(m)	Sam	ples and Insi	tu Test	s		ater Fe	gend	Depth	Level		Stratum Description		strum tation ackfill
=	Depth	Type/FI	TCR	SCR	RQD	3	<u> </u>	(Thickness)	(1100)				Ins ent /Bä
								-					
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42							<u> </u>	- -					
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44								44.10	76.05				
								44.10	70.95	Hard firm ch	nalk with flint		
45						╞╴┟╧							
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						╒╶┝┷ ╒╴┝┯	rt r	40.00	72.05				
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49						Ē							
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E 60						F							
										Douber Date	Mater 01 1	01	Bure
Genera	al Remarks	rs l imited 2)	RACE		ייוואט		38.0	רע (צ ע INI)		Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Bas	e Dia.
vertica	lly												

Project	Name						Pr	oject No:				ROTARY	HOLE
Fontm	nell Close, S	St Albans					36121			l			
Client							St	art Date	En	d Date			
Insure	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose an	d	12/01/20	16	12/01/2016		BH20)9
Contrac	tor						Gr	ound Level					-
Variou	IS								121.18m	OD			
Method/	Plant						Co	ordinates			Logged By:	Sheet 1	of 2
C6								515457	Е	208420 N	Checked By:	Scale	1:100
	San	nples and Insi	itu Test	ts		2		Depth	Loval				트 원들
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Project	Name						Ρ	Project No:			ROTAR			
Fonti	mell Close, S	St Albans							3612	1				
Client Insur HCC	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose a	and	tart Date 12/01/20	Er)16	nd Date 12/01/2016		BH209		
Contra	ctor						G	round Level						
Vario	US								121.18m	OD	Logged By:	Sheet 2 of 2		
C6	d/Plant							515457	E	208420 N	Checked By:	Scale 1:100		
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Projec	t Name					F	Project No:						ROTARY HOLE			DLE		
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Projec	t Name						Project No:							RO	TAR	ү но	LE
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Client							St	art Date	En	d Date							
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Project	Name						Project No: 36121						R0 ⁻	τάρυ μ	
Fontm	nell Close, S	St Albans					36121 Start Date End Date								
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17 deg	rees	/////// <i>Z</i>	2. UL	2 011			2.01	0, 011							
Project	Name						Р	roject No:				ROTARY	HOLE		
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Fontm	nell Close, S	St Albans							3612	1					
Client	60.44						. S	tart Date	En	d Date					
HCC	ers of 8-11 F	ontmell Cl	ose &	1 Bri	die Ci	ose an	a	14/01/20	016	14/01/2016	oetechcett	BH2	11		
Contrac	tor						G	round Level							
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Method	/Plant						С	oordinates			Logged By:	Sneet	OT 2		
C6								515459	E	208421 N	Checked By:	Scale	1:100		
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Genera	l Remarks	1	1	1	1	ı — I		1		Boring Progre	ess Water Strik	e Cori	ing Run		
1) Con	tractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LC	G O	NLY 2) Dril	led at				Dia.		
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Project No:	ROTARY HOLE
Fontmell Close, St Albans 36121	
Client Start Date End Date Insurers of 8-11 Fontmell Close & 1 Bridle Close and HCC 14/01/2016 14/01/2016	BH211
Contractor Ground Level	
Various 121.24m OD	Sheet 2 of 2
Method/Plant Coordinates Logged by: C6 515459 E 208421 N Checked By:	Scale 1:100
(m) Samples and Insitu Tests by Legend Depth Level	intion tintion
Depth Type/FI TCR SCR RQD S (m OD)	Instead
Image: State of the state o	
End of Borehole at	: 40.00m
General Remarks Boring Progress Wat	ter Strike Coring Run
1) Contractor - Forkers Limited 2) BASED ON DRILLERS LOG ONLY 2) Drilled at	

Projec Font	tt Name mell Close, S	t Albans					I	Project No:	3612 [,]	1		ROTARY	Y HO	DLE
Client Insu HCC	rers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose ai	nd	Start Date 15/01/20	En)16	d Date 15/01/2016		BH2	212	2
Contra	actor							Ground Level						
Vario	bus								121.25m	OD		Sheet	1 of	2
Metho C6	d/Plant						(Coordinates 515461	Е	208422 N	Checked By:	Scale	1:	2 100
(m)	Sam	ples and Insi	itu Test	ts		ter	000	Depth	Level		Stratum Description			rum kfill
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Gene	al Romarke								<u> </u>	Boring Progr	ess Water Strike	Co	rina F	Run
1) Co	ntractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LO) G (ONLY 2) Dril	led at	Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top	Base	Dia.
17 de	grees)						,						

Project	Name						Pro	oject No:					ROTAR	YHOLE
Fontr	nell Close, S	t Albans							3612 [,]	1				
Client Insur	ers of 8-11 F	ontmell Clo	ose &	1 Brid	dle Cl	ose an	d Sta	art Date	En	d Date			БЦ	242
HCC Contra	ctor						Gr	round Level	10	15/01/2016	pe	terbrett	БП	212
Vario	us							,	121.25m	OD				
Method	l/Plant						Co	ordinates			Logged By	y:	Sheet	2 of 2
C6								515461	E	208422 N	Checked E	By:	Scale	1:100
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General 1) Cor	ai Kemarks	urs l imited 21	RASE		ווופח	FRSIC	G 🗥	VI Y 2) Dril		Date/Time De	pth Cas. Depth	Strike Time (min)	Rose to Top	Base Dia.
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Project	Name						P	roject No:				ROTAR)	
Fontr	nell Close, S	t Albans							3612	1			HOLL
Client							s	tart Date	En	d Date			
Insur	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose a	nd	05/01/20	016	05/01/2016		BH2	213
Contra	ctor						G	round Level					
Vario	us								121.12m	OD			
Method	I/Plant						С	oordinates			Logged By:	Sheet	1 of 3
C6								515456	E	208423 N	Checked By:	Scale	1:100
(m)	Sam	ples and Ins	itu Tesi	ts		ater	egen	Depth	Level		Stratum Description		trum ation ckfill
	Depth	Type/FI	TCR	SCR	RQD	<u> </u>		(Thickness)	(m OD)	Concrete we	ek porto		Ins: ent: /Ba
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Genera	al Remarks				-	L				Boring Progre	Cas. Depth Strike Time (min)	Rose to Top	ring Run Base Dia
1) Cor 7 deor	ntractor - Forke rees	rs Limited 2)	BASE	D ON	DRILL	ERS L	OF O	NLY 3) Drill	led at				
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Projec	t Name						F	Project No:	2040			ROTARY	IOLE
Client	mell Close, S	ot Albans					5	Start Date	3612 En	d Date			
Insu HCC	rers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose a	and	05/01/20)16	05/01/2016	oeterbrett	BH2 ²	3
Contra	actor						C	Ground Level	404 40	00			
Metho	od/Plant							Coordinates	121.12M	UD	Logged By:	Sheet 2	of 3
C6								515456	E	208423 N	Checked By:	Scale	1:100
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Gene	ral Remarks					. I	a-			Boring Progr Date/Time Depth	ess Water Strike Cas. Depth Strike Time (min)	Rose to Top Ba	g Run ise Dia.
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Client	, -						St	art Date	En	d Date				
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Project	Name						Pr	oject No:				ROTARY H	OI F
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vario	us								122.10m	00	Logged By:	Sheet 1 o	f 2
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Project	Name						Pr	oject No:				ROTARY	HOLE
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Variand 121.84m OF Logend Dy- Logend Dy- Stretch Dearth Tether Stheet 3 T 3 C6 Samples and Institu Tether Sole (1) Stheet 3 T 3 Cm Dearth Total (1) One work (1) One work (1) Stheet 3 T 3 Cm Dearth Total (1) Sole (1)	Contrac	tor						Gr	ound Level					
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Samples and insitu Tests Solution Eagen Dopth Lawes Topph TypeFi TOR S.R.I ROB Lawes Image: Solution of the solu	C6								515467	Έ	208430 N	Checked By:	Scale	1:100
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Projec	ct Name						Pr	oject No:				ROTARY H	IOLE
Font	tmell Close, S	t Albans							36121				
Client	rers of 8-11 F	ontmell Clo	ose &	1 Brie	dle Cl	ose an	Sta d	art Date 18/01/20	En)16	d Date 18/01/2016	poc	BH21	7
Contra	actor						Gr	ound Level					•
Vario	ous								121.15m	OD			
Metho	od/Plant						Co	ordinates			Logged By:	Sheet 1 c	of 3
C6								515456	E	208422 N	Checked By:	Scale	1:100
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Gene	ral Remarks	1	I	L	I					Boring Progr	ress Water	Strike Coring	g Run
1) Co	ontractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LO	g of	NLY 3) Dril	led at	Depth	Cas. Depth Strike Time	(min) Kose to Top Bas	se Dia.
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r ojournamo	ROTARY HOLE
Fontmell Close, St Albans 36121	
Client Start Date End Date	
Insurers of 8-11 Fontmell Close & 1 Bridle Close and 18/01/2016 18/01/2016	BH217
Contractor Ground Level	2.12.17
Various 121.15m OD	
Method/Plant Coordinates Logged By:	Sheet 2 of 3
C6 515456 F 208422 N Checked By:	Scale 1.100
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Depth Type/FI TCR SCR RQD > (Thickness) (Thickness)	ln /B
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Sandy Chalk 50/50 light brown	
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E White chalk, very hard flint bands	
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General Remarks Boring Progress Water Strike Boring Progress Water Strike Date/Time Depth Cas. Depth Strike Time (min) Rose	Coring Run se to Top Base Dia.
1) Contractor - Forkers Limited 2) BASED ON DRILLERS LOG ONLY 3) Drilled at 7 degrees	

Project	Name						Ρ	roject No:				R	OTAR	ү но	LE
Fontr	nell Close, S	St Albans							3612 [,]	1					
Client							s	tart Date	En	d Date					
Insur HCC	ers of 8-11 F	ontmell Clo	ose &	1 Brie	die Ci	ose a	nd	18/01/20	016	18/01/2016	oetechcet		BH2	217	
Contrac	ctor						G	round Level							
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C6								515456		208422 N	Checked By:	5	cale	1.1	100
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7 degr	ees	sis Linited Z)	DHOE				0.90		icu al						

Project Name Fontmell Close, St Albans	Project No: 361	121	aba	ROTARY HOLE
Client Insurers of 8-11 Fontmell Close & 1 Bridle Close and HCC	Start Date 19/01/2016	End Date 19/01/2016	_ peterbrett	BH218
Various	Ground Level	lm OD		
Method/Plant	Coordinates		Logged By:	Sheet 1 of 3
C6	515455 E	208422 N	Checked By:	Scale 1:100
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	19.50 101.6	Very light bro	own to white sandy chalk, fl	int
			Continued of Next Sheet	
General Remarks 1) Contractor - Forkers Limited 2) BASED ON DRILLERS LOG 7 degrees	ONLY 3) Drilled at	Boring Progre Date/Time Depth	ess Water Strike Cas. Depth Strike Time (min)	Rose to Top Base Dia.

Project	Name						Pr	oject No:				ROTARY HOLE
Fontr	nell Close, S	t Albans							36121	l		
Client Insur HCC	ers of 8-11 F	ontmell Clo	ose &	1 Brio	dle Cl	ose ar	d St	art Date 19/01/20	En)16	d Date 19/01/2016		BH218
Contra	ctor						G	round Level				
Vario	us								121.14m	OD		Cheat 2 of 2
Method	d/Plant						C	oordinates	_		Logged By:	Sheet 2 of 3
C6								515455	E	208422 N	Checked By:	Scale 1:100
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Genera	al Remarks		1	1	1			1		Boring Progre	water Strik	e Coring Run
1) Cor	ntractor - Forke	ers Limited 2)	BASE	D ON I	DRILLI	ERS LC	G O	NLY 3) Dril	led at	ate/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Base Dia.
7 degi	rees											

Project	Name						Pr	oject No:				ROTARY	HOLE
Fontr	nell Close, S	t Albans							3612	1			
Client							St	art Date	En	d Date			
Insur	ers of 8-11 F	ontmell Clo	ose &	1 Brid	die Ci	ose and	1	19/01/20	016	19/01/2016	oetechcett	BH2	18
Contrac	ctor						Gr	round Level					
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Method	l/Plant						Co	oordinates			Logged By:	Sheet 3	3 of 3
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Project	Name						Pr	oject No:				ROTARY	IOLE
Fontr	nell Close, S	t Albans							36121	l		RonAlth I	IOLL
Client	· ·						St	art Date	En	d Date			
Insur	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose an	d	26/01/20	16	26/01/2016		BH21	9
Contrac	ctor						G	round Level	-				•
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Genera	al Remarks				1				 	Boring Progre	water Stri	ke Coring	g Run
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Project	Name						Pro	ject No:							RC	TAR	ү но	DLE
Fontm	nell Close, S	t Albans							3612 [,]	1							-	
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Contrac	tor						Gro	ound Level		~ ~								
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C6	Fidili						CO	515452	Е	208434	N	Checked	Bv:		Sc	ale	- •. 1.	- 100
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1) Con	tractor - Forke	ers Limited 2)	BASE	DON	DRILL	ERS LO	G ON	led at	Date/Time	Depth	Cas. Depth	Strike	Time (min)	Rose to	Тор	Base	Dia.	
8 degre	ees																	
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Project	t Name						F	Project No:				ROTAR	(HOLE
Font	mell Close, S	t Albans							36121	l			
Client							5	Start Date	En	d Date			
Insur	ers of 8-11 F	ontmell Clo	ose &	1 Bri	dle Cl	ose a	nd	25/01/20	16	25/01/2016		BH2	220
Contra	ctor						(Ground Level					
Vario	ous								122.14m	OD			
Metho	d/Plant						(Coordinates			Logged By:	Sheet	1 of 2
C6								515450	Е	208436 N	Checked By:	Scale	1:100
	Sam	ples and Ins	itu Test	s		r		Depth	Lovol				특등률
(m)	Depth	Type/FI	TCR	SCR	RQD	Wat	Leger	nd (Thickness)	(m OD)		Stratum Description		Instru entati /Back
								8		Trial Pit			
Ē								(1.20)					
								1.20	120.94	Sand Gravel			
Ē								(0.80)					
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Εl						ĒË	r r			Pale Sand Cr	naik, Off white		
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ΕΊ						ĒĒ	т т т						
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20						F		1			Continued of Next Sheet		
Gener	al Remarks		L						L	Boring Progre	water Strike	e Co	ring Run
1) Co	ntractor - Forke	rs Limited 2)	BASE	D ON	DRILL	ERS L	OG (ONLY 3) Dril	led at	Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top	Base Dia.
8 deg	rees	,						ź					

Projec	t Name						Ρ	roject No:				ROTARY HOLI	E
Font	mell Close, S	t Albans							36121	l			_
Client							s	tart Date	En	d Date			
Insu	rers of 8-11 F	ontmell Clo	ose &	1 Brid	dle Cl	ose ar	d	25/01/20	016	25/01/2016		BH220	
Contra	actor						G	round Level					
Vario	ous								122.14m	OD			
Metho	d/Plant						С	oordinates			Logged By:	Sheet 2 of 2	
C6								515450	E	208436 N	Checked By:	Scale 1:10	0
	Sam	inles and Insi	itu Test	s		2		Denth	Laval			E	u III
(m)	Denth	Type/Fl	TCR	SCR	ROD	_ Nat	egen	d (Thickness)	(m OD)		Stratum Description	nstru	Back
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22							1	22.00	100.14	White Chalk,	flint		
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Gene	ral Remarks			-						Boring Progre	ss Water Stril Cas. Depth Strike Time (min)	Coring Run Rose to Top Base I	Dia.
1) Co 8 dea	ntractor - Forke rees	ers Limited 2)	BASE	D ON	URILLI	ERS LO	JG Ö	NLY 3) Dril	ied at				
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Project	Name						Pro	ject No:				ROTARY H	OLE
Fontn	nell Close, S	St Albans							3612 [,]	1			
Client							. Sta	rt Date	En	d Date			
HCC	ers of 8-11 F	ontmell Clo	ose &	1 Bri	die Ci	ose and	1	20/01/20	16	20/01/2016	oeterbrett	BH22 ⁻	1
Contrac	ctor						Gro	ound Level					
Variou	us								122.15m	OD		Chaot 1 a	<u>.</u>
Method	/Plant						Co	ordinates	_		Logged By:	Sheet 10	1.3
C6								515437	E	208429 N	Checked By:	Scale 1	:100
(m)	San	nples and Ins	itu Test	ts	T	ei ate	gend	Depth	Level (m OD)		Stratum Description		strum tation ackfil
=	Depth	Type/FI	TCR	SCR	RQD	= ***		(Thickness)	(02)	Sand Grave	1		ü 9 Q
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E 20											Continued of Next Sheet		
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Genera 1) Con	u kemarks itractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS LOO	G ON	ILY 3) Drill	ed at	Date/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Base	Dia.
15 deg	irees						2.1	-,					
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Projec	t Name						P	roject No:							RC	DTAR	ү но	LE
Font	mell Close, S	t Albans							3612	I								
Client							. s	tart Date	En	d Date								
Insu	rers of 8-11 F	ontmell Clo	ose &	1 Brie	die Ci	ose a	nd	20/01/20	016	20/01/2	2016		ptoch	COLL		BH	221	
Contra	actor						Ģ	round Level						I ELL				
Vario	ous								122.15m	OD								
Metho	d/Plant						C	oordinates				Logged	By:			Sheet	2 of	3
C6								515437	E	20842	9 N	Checked	l By:		Sc	ale	1:1	100
	Sam	ples and Insi	tu Test	ts		ter .		Depth	Level						I			kfill um
(m)	Depth	Type/FI	TCR	SCR	RQD	A a	egen	d (Thickness)	(m OD)			Stra	itum Des	cription				Instr entai /Bac
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Gener	al Remarks	I	I	1	1	<u> </u>		1		Borin	g Progre	SS	Stail	Nater Stril	ke	Co	oring R	un
1) Co	ntractor - Forke	ers Limited 2)	BASE	D ON	DRILL	ERS L	DG C	NLY 3) Dril	led at	ale/ IIIIe	Deptn	Cas. Depth	JUIKE	(min)	RUSE IO	тор	Dase	
is de	grees																	
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Project	Name						Pro	oject No:							RC	TARY	′ НО	LE
Fontm	nell Close, S	t Albans							3612 [,]	1								
Client Insure HCC	ers of 8-11 F	ontmell Clo	ose &	1 Brio	dle Cl	ose and	s ta	art Date 20/01/20	En)16	d Date 20/01/20	016			Cett		BH2	221	
Contrac	tor						Gr	ound Level										
Variou	JS /Diant						6	ordinates	122.15m	OD		Logged I	Bv:			Sheet	3 of :	3
C6	Fidin							515437	F	208429	N	Checked	Bv:		Sc	ale	1.1	100
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(m)	Depth	Type/FI	TCR	SCR	RQD	Le A	gend	(Thickness)	(m OD)			Stra	tum Des	cription				Back
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Genera	I Remarks tractor - Forke	ers Limited 21	BASE		DRILL	ERSIO	G ON	NLY 3) Dril	led at	Boring Date/Time	Depth	SS Cas. Depth	V Strike	vater Strik Time (min)	e Rose to	Тор	Base	Dia.
15 deg	rees		2. 100	2 0111			2 01	0, 0,1										
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Projec	t Name						Project	t No:				ROTARY H	OLE
Font	mell Close, S	t Albans							36121				OLL
Client	· ·						Start D	ate	En	d Date			
Insu	rers of 8-11 F	ontmell Clo	ose &	1 Brie	dle Cl	ose and	21	/01/20	16	21/01/2016		BH222	2
Contra	actor						Ground	d Level					-
Vario	us								122.04m	OD			
Metho	d/Plant						Coordi	nates		00	Logged By:	Sheet 1 of	f 2
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(m)	Sam	ples and Insi	itu Test	ts		Lei Lei	gend D	Depth	Level		Stratum Description		strun tatio
	Depth	Type/FI	TCR	SCR	RQD	- ***	(Thi	ickness)	(11 00)	Trial Dit			en Bi
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Gener	al Remarks		1	I	1		I			Boring Progre	water Strike	Coring	Run
1) Co	ntractor - Forke	rs Limited 2)	BASE	D ON	DRILL	ERS LOO	G ONLY	3) Drill	ed at	ate/Time Depth	Cas. Depth Strike Time (min)	Rose to Top Base	Dia.
14 de	grees												
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Project	Name						Pro	ject No:							RC	TAR	ү но	LE
Fontn	nell Close, S	St Albans							36121	1								
Client							Sta	art Date	En	d Date								
Insure	ers of 8-11 F	ontmell Clo	ose &	1 Brie	dle Cl	ose and	1	21/01/20	016	21/01/2	016					BH	222	
Contrac	ctor						Gro	ound Level					etero	recc				
Vario	us								122.04m	OD								
Method	/Plant						Co	ordinates		-		Logged	By:		5	Sheet	2 of	2
C6								515434	Е	20843 [.]	1 N	Checked	By:		Sc	ale	1:1	100
	Sam	nles and Insi	tu Toet	·e		5		Denth										ε5≣
(m)	Denth			S S S	POD	Ser Rei	gend	(Thickness)	(m OD)			Stra	itum Des	cription				nstru ntati Backi
	Deptil	турелт	TOR	301	RQD		<u></u>	(Thekness)										- 9 -
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								(2.50)										
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27							rt p			White	Chalk,	Flint Par	ts, Sand	Trace				
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Genera	I Remarks	vice Limited O			יייוסח			יי- ח (v או		Boring Date/Time	Depth	Cas. Depth	Strike	Time (min)	e Rose to	Top	Base	un Dia.
14 deg	iracior - Forke Jrees	ns Limited 2)	DASE		URILL		JUN	i∟t 3) Dfll	ieu al									

Projec	t Name				P	Project No:				TRIAL F	эιт
Font	mell Close, S	St Albans					36121	l			
Client Insu HCC	rers of 8-11 F	ontmell Clo	ose & 1 Bridle C	Close a	and	tart Date	En) 16	d Date 12/01/2016	oeterbrett	ТР30	1
Contra	actor				Ģ	Fround Level					
Vario	bus								Logged By: CW	Sheet 1 (of 1
Hand	d/Plant	r				oordinates			Checked By:	Scale	1.10
	Som	nloc and Incit	tu Tooto	5		Dopth				Codic	E 5≣
(m)	Depth		Results	Wate	Legen	d (Thickness)	Level (m OD)		Stratum Description		nstru entatio Backf
	Bopti	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Roound			(0.05)		Brick Paving			
						0.05		MADE GROU	IND: Orange brown fine to	o coarse grained	
								sanu.			
				-				MADE GROU Gravel is fine	IND: Dark brown gravelly to coarse, angular ro rou	sandy clay. nded, of flints,	
-				-				brick and plas	stic. Sand is fine to coarse	e grained.	
-				-		8					
-				-		×					
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						× /0 70					
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-				-		0.85		MADE GROU	IND: Orange brown grave	lly sandy clay.	
						8		brick and plas	to coarse, angular to roul	e grained.	
						8					
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-				-		1.50		MADE GROU	IND [.] Dark brown sandy c	avev gravel	-88
-				-				Gravel is fine	to coarse, angular to rou	nded, of flints,	
-				-		(0.20)				graineu.	
						4 70					
						1.70			End of Trial Pit at 1.70m		
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$\left - \right $				-							
<u> </u>											
Gener	ral Remarks						Wa	l Iter	Stability:		
1) Co	ntractor - Harcr	oss Specialis	t Contractors Ltd	2) 20cn	n diam	eter steel p	ile Str	ike	Pit Dimensions	1.60 m	
when	Thames Water	empty drain r	nearby 4) Backfill	w at 1.6 ed with	om, Fa arising	ast now, sto gs	ps Sta	anding w	0.60	n	

Proje	ct Name				F	Project No:					TRIAL	PIT
Fon	tmell Close, S	St Albans					36121	1				
Client	t Iroro of 9 11 E	Contrall Cla	an 8 1 Bridle C		end	Start Date	En	d Date				
HCC	irers or 6-11 F	ontinell Cit	ose & 1 Bridle C	lose	anu	12/01/20	016	12/01/2016	oeter	brett	TP30)2
Contr	ractor				C	Ground Level						
Vari	ous									CW	Shoot 1	of 1
Metho	od/Plant				C	Coordinates			Logged By.	CVV	Sheet I	
Han	d/ Mini Digge	r					1	1	Checked By:		Scale	1:10
(m)	Sam	ples and Insi	tu Tests	/ater	Leger	Depth Id	Level		Stratum D	escription		strum tatior ackfil
	Depth	Туре	Results	5		(Thickness)	(02)	Brick Paving				<u> </u>
-				-		0.05		MADE GROU	JND: Orange b	rown fine to	coarse grained	
-				-		(0.10)		sand.			<u> </u>	
-				-		0.15		MADE GROU	JND: Brown sa	ndy gravelly	/ clay. Sand is	
-				-		8		fine to coarse	grained. Grav	el is fine to	coarse, angular	
-				-		×		cobbles of flir	nt		100003101101	
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						(0.60)						
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_				_		×		clay. Sand is	IND: Dark brov	vn slightly s grained. Gra	andy gravelly avel is fine to	
-				-		8		coarse, angu	ar to rounded,	of flint and	brick.	
-				-		8						
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- 1				-		8						
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Gene	eral Remarks	nss Snecialie	t Contractors Ltd 2	2) Rac	kfilled	with arising	S Str	ater ike	Stability Pit Dim	/: ensions		
') 00		Soo Opecialis	Contractors Llu Z	., Dau	uncu		Sta	anding			4.00 m	
							Flo	w		1.00 m	ı	

Project I	Name				F	Project No:					TRIAL	PIT
Fontm	nell Close, S	t Albans					3612	1				
Client	vrc of 9 11 E	ontmoll Cla	so 8 1 Bridlo (and	tart Date	Er	nd Date		\mathbf{N}		
HCC	500-111	onumen cio		51036	anu	12/01/20	016	12/01/2016	peter	brett	TP3)3
Contract	tor				G	Fround Level						
Variou	IS (Diant								Logged By:	CW	Sheet 1	of 1
Hand/	Mini Digge	r				oordinates			Checked By:		Scale	1.10
	Som	nloo and Inci	tu Tooto	5		Denth			chicollog Dy.		Ocale	E 5≣
(m)	Denth		Results	Wate	Legen	d (Thickness)	Level (m OD)		Stratum D	escription		nstru entatio Backf
	Doptil	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	rtoouno			(0.05)		Brick Paving				
-				-		0.05		MADE GROU	JND: Orange b	rown fine to	coarse grained	
						0.10		Sanu.				
						0.15		MADE GROU	JND: Orange b Sand is fine to	rown mottle	d brown sandy ned Gravel is	
				_		8		fine to mediu	n, angular to s	ub-rounded	, of bricks,	
				_		8		chaik, nint an	u polystyrene.			
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$\left - \right $				F		8						
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General	l Remarks	ı			1	1	W	ater	Stabilit	y:	_	1
1) Cont	tractor - Harcr	oss Specialis property 3) Ba	t Contractors Ltd	2) 40cı nas	m diam	eter concre	te pile St	rike anding	Pit Dim	ensions	2.00 m	
				5			Flo	ow DW		1.50 m	1	

Project Na	ime			Project No:				DYNA	MIC PROBE
Fontme	ll Close, St Alba	ns		36	121				_
Client				Start Date	End Date				
Insurers	s of 8-11 Fontme	ell Close & 1 Br	idle Close and	13/01/2016	13/01/2016			Г)P401
Contractor	r			Ground Level			orett	-	
Various									
Wathod/DI	opt			Coordinatoo		Ria Crew:		Sh	neet 1 of 1
Clabel (Coordinates		Objective d. Duri		Cool	a 1.50
Global	Geolech					Спескеа Ву:		Scal	e 1.50
Depth			Blows	/ 100mm			Torque		Remarks
(m)	0 5 		10	15 2		5 3	30 (NIII)		
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E	0 0								
	0							_	
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2	0						0	-	
E	1								
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3	1							_	
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-	3							_	
- 4	4						38	_	
	3								
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6			10	16			125		
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8							1	-	
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F								F	
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F								-	
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General P	emarks						o:		
1) Contra	actor - Stunt Drilling	Ltd 2) Area clear	ed with Cat Scan	Prior to	Drop Ht (mm)	500	Cone Dia.	(mm)	45
commen	cement 3) Probe co	ompleted on platfo	orm 4) Platform to	Ground 0 - 0.6m 5)	Hammer Wt (kg)	63.5	Damper		
Terminate	ed due to refusal				Einal Donth (m)	6 60	Tunn		рвен
					Pinai Depth (m)	UG.0	Type		DLOU



Project Na	ame		Project No:				DYN	MIC PROBE
Fontme	ell Close, St Alba	ns	36	5121				-
Client			Start Date	End Date				
Insurer	s of 8-11 Fontme	ell Close & 1 Bridle Close and	13/01/2016	13/01/2016			Γ	DP403
HCC Contracto	r		Ground Level			orett	-	
Various	•							
Various Mothod/D	lant		Coordinatoo		Ria Crew:		SI	neet 1 of 1
Clabal			Coordinates		Charling d Dur		Coo.	la 1:50
Global	Geolech				Спескей Ву:		Sca	le 1.50
Depth		Blows	/ 100mm			Torque		Remarks
(m)	0 5	5 10	15 2	20 2	5 3	₃₀ (NM) ↓		
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- 4		7				- 30	-	
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E		10 10					E	
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- 5		10				43	-	
F		12					-	
-		13	4				F	
		10 12						
-		9					F	
6		9 10	4			- 38	-	
-			17	23			-	
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- 10						-	F	
General F	Remarks			Drop Ht (mm)	500	Cone Dia.	(mm)	45
1) Contra	actor - Stunt Drilling	Ltd 2) Area cleared with Cat Scan	Prior to		60 E	Dampar		
Terminat	ed due to refusal	ompleted on platform 4) Platform to	Ground 0 - 0.6m 5		03.3	Damper		
				Final Depth (m)	6.50	Туре		DPSH




Project Na	ame	F	Project No:			DYNA	MIC PROBE	
Fontme	ll Close, St Albans		36	121				
Client		5	Start Date	End Date		\cap		
HCC	s of 8-11 Fontmell Close & 1 Bridle Clo	ose and	13/01/2016	13/01/2016	oetech	cett	C)P405
Contractor	r	C	Ground Level					
Various	i							
Method/Pla	ant	C	Coordinates		Rig Crew:		Sr	leet 2 of 2
Global (Geotech				Checked By:		Scal	e 1:50
Depth		Blows /	100mm			Torque		Remarks
(m) (0 5 10 I I I	12	5 2		5 3	0 (Nm)		
E	9	12					_	
_	7 7 6						-	
	6 6						_	
- 11	6 6 6					89	_	
-	7 8						-	
_	8						_	
	8						_	
- 12	7 7 7					62	_	
_	7 6						-	
_	7						_	
-	10 10 8						-	
- 13	7					110	-	
_	8 6						-	
	777						-	
-	6 6						-	
- 14	5 5 5					101	_	
- 14	7					101	_	
	7 8						_	
	7 8						_	
-	8					160	_	
- 15	777					160	_	
-	6 7						-	
	7 9						_	
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- 16	8	14				133	_	
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General R	l Remarks			Drop Ht (mm)	500	Cone Dia	(mm)	45
1) Contra	actor - Stunt Drilling Ltd 2) Area cleared with (Cat Scan P	rior to			De la		- v
comment	cement 3) Terminated due to refusal			Hammer VVt (Kg)	63.5	Damper		
				Final Depth (m)	16.40	Туре		DPSH

Project Na	me		Project No:				DYNA	
Fontme	ll Close, St Alba	ns	30	6121				
Client	· ·		Start Date	End Date				
Insurers	of 8-11 Fontme	ell Close & 1 Bridle Close and	14/01/2016	14/01/2016			0	DP406
Contractor			Ground Level			orecc		
Various								
Method/Pla	ant		Coordinates		Rig Crew:		Sheet 1 of 1	
Global	Geotech				Checked By:		Scal	e 1.50
					onconcer by:		000	1.00
Depth (m)		Blows	s / 100mm		-	Torque (Nm)		Remarks
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-	2 2 2						-	
3	2							
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Ganaral D	omorka			1				
1 Control	emarks ctor - Stunt Drilling	I td 2) Area cleared with Cat Scon	Prior to	Drop Ht (mm)	500	Cone Dia.	(mm)	45
commenc	cement 3) Terminat	ted due to inclination		Hammer Wt (kg)	63.5	Damper		
				Final Depth (m)	3.00	Туре		DPSH
						.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		21 911





Project Name				Project No:				DYN	AMIC PROBE
Fontme	ell Close, St Alba	ans		30	6121				
Client				Start Date	End Date		\mathbf{O}		
HCC	s of 8-11 Fontme	ell Close & 1 Bri	die Close and	14/01/2016	14/01/2016	Oetech	cett	ו	DP408
Contracto	or			Ground Level					
Various	5								
Method/P	lant			Coordinates		Rig Crew:		SI	neet 1 of 2
Global	Geotech					Checked By:		Sca	le 1:50
Depth			Blows	/ 100mm			Torque		Remarks
(m)	0 6	5 11 I I	0	15	20 29	5 :	₃₀ (Nm)		Tomano
	3	6							
_	4	6						-	
E	3	7						_	
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	2 3								
–	2 2							_	
	0							_	
2	0 2						- 0	-	
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E	0								
- 3	0						0	-	
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E	2							_	
	2							-	
-								_	
5							43	_	
_	2 3							-	
	3							_	
_	2 2							_	
6	2						62	-	
-	3							-	
E	2 3							_	
F								-	
7							40	<u> </u>	
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8	2						140	-	
	3								
-	4 4 4							-	
	4							E	
9							85	 	
-	3							Ľ	
_	4 4								
-	3							-	
				1	1		133	 	
General I	Remarks				Drop Ht (mm)	500	Cone Dia	(mm)	45
1) Contra	actor - Stunt Drilling	g Ltd 2) Area cleare	ed with Cat Scan	Prior to		000	Deres :	·····/	**
commen	icement 3) Termina	ted due to refusal				63.5	Damper		
					Final Depth (m)	12.70	Туре		DPSH

Project Name				Project No:				DYNA	MIC PROBE
Fontme	ll Close, St Alba	ns		30	6121				
Client	o of 9 11 Eontma		dia Class and	Start Date	End Date		\mathbf{O}		
HCC				14/01/2016	14/01/2016	oeterb	rett	ו	DP408
Contractor	r			Ground Level					
Various	i					Rig Crew:		5	neet 2 of 2
Method/Pl	ant Cootoob			Coordinates		Checked Du		Soc	
Global V	Geolech					Спескей Ву.		Sca	IE 1.50
Depth (m)	0 5	5 1	0 Blows	/ 100mm	20 2	5 3	Torque 30 (Nm)		Remarks
		5						_	
- - -		5						- - -	
		6						_	
-		5 5 5					100	_	
- 11 -		6					120	_	
-		6						_	
_		8	10					_	
_ 12			10 10 10				150	_	
-			13	4				_	
-				10 19	9	25		_	
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- 13 -							-		
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16							-	-	
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17							1		
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18							-	_	
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19							-	- 	
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20			<u> </u>	1			-	<u> </u>	
General R	Remarks				Drop Ht (mm)	500	Cone Dia	(mm)	45
1) Contra	actor - Stunt Drilling	Ltd 2) Area cleare	ed with Cat Scan	Prior to		000	Derer Did.	()	70
comment	cement 3) Terminat	ted due to refusal			Hammer vvt (kg)	63.5	Damper		
				Final Depth (m)	12.70	Туре		DPSH	



Project Na	ime		Project No:				DYNA		Е
Fontme	ll Close, St Alba	ans	3	6121					_
Client			Start Date	End Date					
Insurers	s of 8-11 Fontme	ell Close & 1 Bridle Close and	14/01/2016	14/01/2016	Oetech	Cott	0)P409	
Contractor	-		Ground Level						
Various									
Method/Pla	ant		Coordinates		Rig Crew:		Sł	neet 2 of 2	
Global C	Geotech				Checked By:		Scal	e 1:50	
Depth		Blow	s / 100mm			Torque		Pomarks	
(m) (D	5 10 I I	15	20 25		₃₀ (Nm)		Kemano	
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_			18		26		-		
- 11						-	-		
_							_		
_							_		
12						-			
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13 						-	-		
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15 						-	-		
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- 16							-		
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18							<u>-</u>		
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- 19							Ē.		
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20	<u> </u>	II		1			-		
General R	lemarks			Drop Ht (mm)	500	Cone Dia	(mm)	45	_
1) Contra	ictor - Stunt Drilling	g Ltd 2) Area cleared with Cat Scar	n Prior to		000	Deres ::	<i>)</i>	77	
comment	cement 3) Termina	ted due to refusal		nammer vvt (kg)	63.5	Damper			
				Final Depth (m)	11.50	Туре		DPSH	

Project Na	ime			Project No:				DYN/	MIC PROBE
Fontme	ll Close, St Alba	ins		30	6121				
Client				Start Date	End Date				
Insurers	s of 8-11 Fontme	ell Close & 1 Bri	dle Close and	14/01/2016	14/01/2016		COL	[DP410
Contractor	r			Ground Level			rell		
Various									
Method/Pla	ant			Coordinates		Rig Crew:		Sł	neet 1 of 1
Global (Geotech					Checked By:		Sca	e 1:50
Denth			Blows	/ 100mm			Torque		
(m)	o 5	5 10)	15	20 29	5 :	₃₀ (Nm)		Remarks
_	0 0							_	
F	2 2							_	
-	2 2							-	
	1							_	
- 1 -	1						0	_	
E	1							_	
_	0							-	
	1							_	
2							0		
_	2 2							_	
_	2							_	
-	2 3							-	
3	2						0	_	
-	2							-	
_	1							-	
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4							41	_	
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-	1 2							-	
E	2 2								
- 5	2 3						89	-	
	2							_	
_	2 3							-	
	2 2							_	
- 6	2 2						111	_	
	3 4							_	
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General R	l Remarks					500	Conce Die	(mm)	AE
1) Contractor - Stunt Drilling Ltd 2) Area cleared with Cat Scan Pr			Prior to		500		(1111)	40	
comment	cement 3) Terminat	ted due to refusal			Hammer Wt (kg)	63.5	Damper		
					Final Depth (m)	7.80	Туре		DPSH



Proje	ct Name				F	Project No:					WINDOW	SAMPLE
Fon	tmell Close, S	St Albans					3612	1				
Clien	t Irors of 9 11 E	Contracil Cir	so 8 1 Bridlo C		ed S	Start Date	En	d Date				
HC				iuse a	nu	15/01/20	16	15/01/2016	peter	orett	WS	501
Cont	ractor				G	Bround Level						
Vari	ous								Logged By:	CW	Sheet	1 of 1
Meth	od/Plant				C	Coordinates				011	Casla	1.00
GIO	bai Geotech			.					Спескеа ву:		Scale	1.20
(m)	Sam	ples and Insi	tu Tests	Vater	Legen	Depth	Level (m OD)		Stratum Do	escription		istrun ntatio šackfi
	Depth	Туре	Results			(Thickness)		No recovery				- 5 U
_												
F						(0.45)						
-				-								
-						0.45		MADE GROU	IND [.] Orange br	own fine to	coarse sand	
Ē						0.55		MADE GROU	IND: Brown sar	ndy gravelly	/ clay. Sand is	
_						×		fine to coarse	grained. Grave	el is fine to	coarse, angula	ar
_						(0.45)		Chalk			•	
-				-								
<u> </u>				Ē		1.00		No recovery				
E						(0.30)						
_						(0.00)						
-						1.30		MADE GROU	IND: Brown cla	yey sandy	gravel. Sand is	s 🕅
-						(0.20)		fine to coarse to sub-angula	grained. Grave r, brick, flint an	el is fine to d rubble	coarse, angula	ar
-						1.50		MADE GROU	IND: Dark brow	n clayey sa	andy gravel.	
_						(0.35)		angular to sub	oarse grained. p-angular, of br	ick, flint and	d rubble	
E												
-						1.85		_ Brick MADE GROU	IND: Orange br	own slightl	y sandy claye	/ 🕅
- 2						2.00		gravel. Grave	l is fine to coars	se, angular	to rounded,	
-								No recovery			lioo grainea.	
E						(0.40)						
_												
-						2.40		MADE GROU	IND: Dark brow	n clayey sa	andy gravel.	
-						(0.30)		angular to sub	oarse grained. p-angular, of br	Gravel is fi ick, flint and	ne to coarse, d rubble	
E						2 70						
_						2.70		MADE GROU Sand is fine to	IND: Orange br coarse graine	own grave d. Gravel i	ly clayey sances fine to coarse	l. e.
F						(0.30)		angular to sub	o angular of bri	ck, flint and	rubble	
— — з				F P		3.00						
					~~~~	(0.10)		MADE GROU	IND: Brown cla	iyey aravel	ly sand. Sand	is 🕅
						(0.30)		fine to coarse	grained. Grave	el is fine to	coarse, angula	ar 💓
F												
F						3.40		MADE GROU	IND: Red brow	n slightly s	andy clay. Sar	nd
Ē				E		(0.40)		is tine to coars	se grained			
E				E		(0.40)						
F						3.80						
F						(0.20)		Sand is fine to	ס : Dark brow coarse graine	d. Gravel is	avelly clay. s fine to coarse	e, 🕅
- 4				F P		× 4.00		angular to sub	D-angular of bri	ck, flint and ample at 4.00	l rubble	
	and Dates of							Matar Strika		Winds	W Sample Pur	
Gene	erai kemarks ontractor - Stunt	Drillina Ltd 2	) Area scanned wit	th CAT	Scan	prior to	s	Strike Time (mins)	Rose to Start	End 1 00	Dia. (mm)	Rec. %
cóm	mencement 3) B	ackfilled upor	n completion						1.00	2.00	78	70 60
									3.00	4.00	67	90
L									I			

Proje	ct Name				F	Project No:				WINDOW SA	MPLE
Fon	tmell Close, S	St Albans					36121	l			
Clien	t irers of 8-11 F	ontmell Clo	se & 1 Bridle Cl	ose :	and	Start Date	En	d Date			•
HCC						15/01/20	016	15/01/2016	peterbrett	WS502	2
Conti	ractor					Fround Level					
Meth	od/Plant					Coordinates			Logged By: CW	Sheet 1 of	f 1
Glo	bal Geotech								Checked By:	Scale 1	1:20
	Sam	ples and Insi	tu Tests	r		Depth	Loval				⊑ 5 ≣
(m)	Depth	Туре	Results	Wat	Leger	(Thickness)	(m OD)		Stratum Description	n	Instru entati /Back
-				-				No recovery			
				E		(0.40)					
-				F		(0110)					
-				-	*****	0.40			IND: Brown gravelly slig	ubtly sandy clay	
_						8		Gravel is fine	to coarse, angular to su	ub-rounded, of	
_				-		(0.40)			. Sand is line to coarse	grained.	
-				-		8		Brick			
-				-		0.80		MADE GROU	IND: Grey brown sandy	clayey gravel.	
- 1				E				angular to rou	o coarse grained. Grave inded, brick and flint.	el is fine to coarse,	
- '				-		1.00		No recovery - material was r	blows were required to present. Hole remained	penetrate so open to depth	
-				-							
-				F							
_				-							
_				-							
-				-							
-				-							
_				-							
- - 2				F		(2.00)					
-				-							
_				E							
_				-							
-				-							
-				-							
_											
-				-							
-				-							
- - 3				F		3.00			End of Window Sample at 3	.00m	
				E							
_				-							
-				-							
				E							
-				F							
-				-							
				È							
E				E							
- 4				F							
Gene	eral Remarks			1				Water Strike	Wi	ndow Sample Run	
1) C	ontractor - Stunt	Drilling Ltd 2	) Area scanned with	ר CAT	Scan	prior to	s	trike Time (mins)	Rose to Start 0.00	End Dia. (mm)	60 0
com	mencement 3) B	ackniled upor	completion						2.00	8.00 78	õ

Fontmell Close, S. Albane         039121         Without         Usages by:         CW         Sheet 1 of 1           Without         Samples and Insitu Tests         3         dage         Control Least         Control Least         Control Least         Control Least         Control Least         Scale         1 20           (m)         Samples and Insitu Tests         3         dage         Control Least         Control Leas	Proje	ect Name				F	Project No:				WINDOW S	AMPLE
Client means of 3-11 Portmell Close & 1 Bridle Close and 1 Soft/2016 1 Soft/20	Fon	tmell Close, S	St Albans					36121	l			
Int Comment       United by a full build code of a bui	Clien	t Irors of <b>9 11 E</b>	Contracil Cir	sso 8 1 Bridlo Cl		2	Start Date	En	d Date	$\mathbf{O}\mathbf{O}\mathbf{O}$		
Contractor Verificial Verificia Veri	HCC				iuse a	nu	15/01/20	016	15/01/2016	oeterbrett	WS5	03
Various Numerating Control in the Co	Cont	ractor				C	Ground Level					
	Vari	ous									Sheet 1	of 1
Samples and Instur Tests       B       Lagent       Depth       Type       Stratum Description       Edge T         Image: Samples and Instur Tests       B       Lagent       One convert       No recovery       No re	Meth	od/Plant				C	Coordinates				Seele	1.20
Protect     Type     Results     Page 100 perform     Curved 100 perform     Stratum Description     Page 200 perform       Page 200 perform     Type     Results     0.15     No recovery     No recovery       Contract     Contract     0.15     0.15     Brick       Contract     Contract     0.05     Brick     Brick       Contract     Contract     Contract     Contract     Brick       Contract     Contract     Contract     Contract     Brick       Contract     Contract     Contract     Contract     Contract     Brick       Contract     Contract     Contract     Contract     Contract     Contract       Contract     Contract<	GIO	bai Geolech			1.1					Спескей Ву:	Scale	1.20
Depth         type         Means         P         Influence           0         0.01         0.01         0.01         0.01         0.01           0.02         0.03         0.01         0.01         0.01         0.01         0.01           0.03         0.05         0.05         0.05         0.05         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.02         0.01         0.01         0.02         0.01         0.02         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01         0.01 <th>(m)</th> <th>Sam</th> <th>ples and Insi</th> <th>tu Tests</th> <th>Vater</th> <th>Leger</th> <th>Depth nd</th> <th>Level (m OD)</th> <th></th> <th>Stratum Description</th> <th></th> <th>strun ntatio tackfi</th>	(m)	Sam	ples and Insi	tu Tests	Vater	Leger	Depth nd	Level (m OD)		Stratum Description		strun ntatio tackfi
Image: State		Depth	Туре	Results	>		(Thickness)	· · ·	No recovery			
1       Contract forwar sliphty and gravely digits         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1       0.55         1	_					~~~~~	(0.15)					
a     0.35     medium, angular to sub-rounded. finit. With output to sub-rounded brick, finit and rubble       0.30     Brick       MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, finit and rubble       1.00     No recovery       1.00     MADE GROUND: Grown slightly sandy gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, finit and rubble       0.70     MADE GROUND: Grown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       0.70     MADE GROUND: Grown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       0.70     MADE GROUND: Grange brown fine to coarse, angular to sub-rounded of brick, finit and rubble       0.70     MADE GROUND: Grange brown slightly sandy gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, finit and rubble       0.70     MADE GROUND: Grange brown slightly sandy gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, finit and rubble       0.70     MADE GROUND: Grange brown slightly sandy gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, finit and rubble       0.80     3.20     MADE GROUND: Grange brown slightly clayve slightly gravel sand sand is fine to coarse, angular to sub-rounded. of finit.       0.800     3.80     MADE GROUND: Grange brown slightly clayve slightl	_				-				clay. Sand is	ark brown slightly sandy fine to coarse grained. G	slightly gravelly aravel is fine to	
1     0.50       0.64     Brick       0.65     Brick       0.66     Brick       0.67     MADE GROUND: Brown sightly sandy gravely clay.       0.68     No recovery       1.00     No recovery       1.00     Note GROUND: Brown sightly sandy gravely clay.       1.00     No recovery       1.00     MADE GROUND: Orange brown fine to coarse sand.       1.00     No recovery       1.00     MADE GROUND: Brown sightly sandy gravely clay.       2.00     Sand is fine to bashe graned. Gravel is fine to coarse, angular to sub-rounded of brok, fint and nubble       0.70     Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brok, fint and nubble       1.80     MADE GROUND: Brown sightly sandy gravely clay.       2.40     MADE GROUND: Brown sightly sandy gravely clay.       3.00     Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brok, fint and nubble       2.40     MADE GROUND: Brown sightly sandy gravely clay.       3.00     MADE GROUND: Brown sightly sandy gravely clay.       3.00     MADE GROUND: Grange brown clayey sand, gravely clay.       3.00     MADE GROUND: Orange brown clayey sand, gravel, g	-				-		(0.35)		medium, ang	ular to sub-rounded, flint	With	
0.30     Brick       MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       1.00     No recovery       1.00     MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       1.00     0.10       2.01     MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       1.10     MADE GROUND: Orange brown fine to coarse, angular to sub-rounded of brick, finit and rubble       2.01     MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       2.01     MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       3.00     MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble       3.00     MADE GROUND: Brown slightly sandy gravell, sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of finit.       3.00     MADE GROUND: Crange brown clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of finit.       3.00     MADE GROUND: Crange brown clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of finit.       3	-				-		a a					
ANDE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse. angular to sub-nounded of brick, fint and rubble         1.00 (0.10)       No recovery         1.00 (0.10)       No recovery         1.00 (0.10)       No recovery         1.00 (0.10)       No recovery         MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, fint and nubble         1.00 (0.10)       No recovery         MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, fint and nubble         1.00 (0.10)       MADE GROUND: Orange brown fine to coarse, angular to sub-nounded of brick, fint and nubble         1.00 (0.10)       MADE GROUND: Orange brown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, fint and nubble         1.00 (0.60)       MADE GROUND: Orange brown clayey sandy gravelly claye. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, fint and nubble         3.20       MADE GROUND: Orange brown clayey sandy gravelly gravelly sand. Sand is fine to coarse, angular to sub-nounded of brick, fint and nubble         3.20       MADE GROUND: Orange brown clayey sandy gravelly claye. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick. Thint and nubble         3.20       MADE GROUND: Orange brown clayey sandy gravelly claye.	_						(0.15)		Brick			
and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble         angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble         and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble	_						0.65		MADE GROU	JND: Brown slightly sand	y gravelly clay.	
100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         100       100         200       100         100       200         100       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       100         200       2	-				-		(0.25)		Sand is fine to angular to sul	o coarse grained. Gravel b-rounded of brick_flint a	is fine to coarse, nd rubble	
100       No recovery         MADE GROUND: Brown sliphtly sandy gravelly clay.         3       1.00         1.00       0.700         MADE GROUND: Orange brown fine to coarse sand.         MADE GROUND: Brown sliphtly sandy gravelly clay.         3       1.00         0.700       MADE GROUND: Orange brown fine to coarse sand.         MADE GROUND: Brown sliphtly sandy gravelly clay.         3       3.00         0.701       MADE GROUND: Brown sliphtly sandy gravelly clay.         3       3.00         0.701       MADE GROUND: Brown sliphtly sandy gravelly clay.         3       3.00         0.701       MADE GROUND: Brown sliphtly sandy gravelly clay.         3       0.751         MADE GROUND: Brown sliphtly sandy gravelly clay.         3       0.751         MADE GROUND: Grange brown diayey sandy gravell.         3       3.20         MADE GROUND: Orange brown diayey sandy gravell.         3       3.20         MADE GROUND: Orange brown sliphtly claye.         3.20       MADE GROUND: Orange brown sliphtly claye.         3.20       MADE GROUND: Orange brown sliphtly claye.         3.20       MADE GROUND: Orange brown sliphtly claye.         3.20       MADE GROU	-				-		(0.35)					
1.0       MADE GROUND: Brown slightly sandy gravelly clay.         Sand is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, finit and rubble         0.700       MADE GROUND: Orange brown fine to coarse sand.         1.0       MADE GROUND: Brown slightly sandy gravelly clay.         2.0       Sand is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, finit and rubble         2.0       Sand is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, finit and rubble         2.15       MADE GROUND: Brown slightly sandy gravelly clay.         Sand is fine to coarse grained. Grave is fine to coarse, angular to sub-rounded of brick, finit and rubble         2.40       MADE GROUND: Grave provide is fine to coarse, angular to sub-rounded of brick, finit and rubble         2.40       MADE GROUND: Grave prove is fine to coarse, angular to sub-rounded, of finit.         3.40       Gravel is fine to coarse, angular to sub-rounded, of finit.         3.80       Gravel is fine to coarse, angular to sub-rounded, of finit.         3.80       Gravel is fine to coarse, angular to sub-rounded, of finit.         3.80       Gravel is fine to coarse, angular to sub-rounded, of finit.         4.00       Brown slightly clayey slightly gravells and to sub-coarse, angular to sub-rounded, of finit.         4.00       Brown slightly clayey slightly gravells and tob sub-coarse, angular to sub-rounded, of finit.	- 1						1.00		No recovery			
a       Image: Second Sec							(0.10)		MADE GROU	JND: Brown slightly sand	v gravelly clay.	
angular to sub-rounded of brick, time and rouble         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70)         (0.70	_						8		Sand is fine to	o coarse grained. Gravel	is fine to coarse,	
ADDE GROUND: Orange brown fine to coarse sand. MADE GROUND: Orange brown gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, fint and rubble (0.80) MADE GROUND: Orange brown dayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, fint and rubble (0.80) MADE GROUND: Orange brown dayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, fint and rubble (0.80) MADE GROUND: Orange brown dayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand. Sand is fine to coarse grained. Gravel is MADE GROUND: Orange brown dayey sand. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand gravel. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand gravel. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand gravel. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand gravel. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand gravel. Sand is fine to coarse, angular to sub-rounded of fint. MADE GROUND: Orange brown dayey sand gravel is find to coarse, angular to sub-rounded of fint. Find of Wintow Same at Nome Coarse. MADE GROUND: Orange brown dayey sand gravel is find to coarse. Sand is fine to coarse. Sand is	-						8		angulai to sui			
ADE GROUND: Orange brown fine to coarse sand. MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse graned. Gravel is fine to coarse, angular to sub-rounded of brick, fint and rubble MADE GROUND: Orange brown gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, fint and rubble MADE GROUND: Orange brown gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, fint and rubble MADE GROUND: Orange brown gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, fint and rubble MADE GROUND: Orange brown gravelly clay. Sand is fine to coarse, angular to sub-rounded of brick, fint and rubble MADE GROUND: Orange brown gravelly clay. Sand is fine to coarse, angular to sub-rounded, of fint. End af Window Sample at 4.00m Coarse framewing at 4.00m	-				-		(0.70)					
2       1.80 (0.10) 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.100 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.1000 0.10000 0.10000 0.10000 0.10000 0.10000 0.10000 0.100000 0.100000 0.100000 0.100000000	_				-		×					
2       ADE GROUND: Orange brown fine to coarse and is fine to coarse and is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, fint and rubble         3       0.00         4       0.80         4       0.80         4       0.80         5       0.80         6       0.80         7       0.80         7       0.80         8       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9       0.80         9 <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>8</td> <td></td> <td></td> <td></td> <td></td> <td></td>	_						8					
ADE GROUND: Orange brown fine to coarse sand.         MADE GROUND: Brown slightly sandy gravelly clay.         angular to sub-nounded of brick, finit and nubble         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.5)         (0.6)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.8)         (0.2)         (0.8)         (0.2) <td>_</td> <td></td> <td></td> <td></td> <td>E</td> <td></td> <td>1 80</td> <td></td> <td></td> <td></td> <td></td> <td></td>	_				E		1 80					
ADE GROUND: Brown slightly sandy gravelly clay. Shand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble MADE GROUND: Brown slightly sandy gravelly clay. Shand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble MADE GROUND: Crange brown gravelly clayey sand. Shand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, finit and rubble (0.80) MADE GROUND: Orange brown gravelly clayey sand. Shand is fine to coarse grained. Gravel is fine to coarse, angular to sub-angular to sub-angula	_						(0.10)		MADE GROU	JND: Orange brown fine	to coarse sand.	
3       (0.15)       2.15         3       (0.25)       (0.25)         2.40       MADE GROUND: Brown slightly sandy gravelly clay: sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, flint and rubble         MADE GROUND: Orange brown gravelly clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, flint and rubble         MADE GROUND: Orange brown gravelly clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, flint and rubble         MADE GROUND: Orange brown gravelly clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, flint and rubble         MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick, flint and rubble         MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-nounded of brick. The to coarse grained. Gravel is fine to coarse, angular to sub-nounded of flint.         General Remarks       3.80         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Stite       Stite       Water Stite       Window Sample at 4.000         Water Stite       Water Stite       Stite       Stite       Stite       Stite       Stite       Stite       Stite         Stite       Stite       Stite       Stite       S	- 2						(0.10)		MADE GROU Sand is fine to	JND: Brown slightly sand o coarse grained. Gravel	y gravelly clay. is fine to coarse,	
3       2.15       MADE GROUND: Brown slightly sandy gravelly clay. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, fint and rubble         3       0.80)       MADE GROUND: Orange brown gravelly clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-angular to sub-rounded, of flint.         4       3.20       MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         4       3.80       (0.60)       MADE GROUND: Orange brown slightly clayey slightly gravely sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         6       3.80       MADE GROUND: Orange brown slightly clayey slightly gravely sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         10       0.600       100       100         6       3.80       100       100         10       100       100       100         6       100       100       100         10       100       100       100         10       100       100 </td <td>_</td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>(0.15)</td> <td></td> <td>angular to sul</td> <td>b-rounded of brick, flint a</td> <td>nd rubble</td> <td></td>	_				-		(0.15)		angular to sul	b-rounded of brick, flint a	nd rubble	
3       (0.25)       Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded of brick, filt and rubble         3       (0.80)       MADE GROUND: Orange brown gravelly clayey sand. Sand is fine to coarse, angular to sub angular of brick, filt and rubble         3       (0.80)       MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse, angular to sub angular of brick, filt and rubble         3       (0.80)       MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-angular to sub-angular of brick, filt and rubble         4       (0.80)       MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of fint.         4       (0.60)       MADE GROUND: Orange brown slightly clayey slightly gravel is fine to coarse, angular to sub-rounded, of fint.         4       4.00       MADE GROUND: Orange brown slightly clayey slightly gravel is fine to coarse, angular to sub-rounded, of fint.         5       0.00       100       End of Window Sample At 00m         Weter Strike Window Sample Rum         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Stike Time (mining)       100       100       100       100       100       100         Stike Time (mining)       100       100       100       100       100	-						2.15		MADE GROU	JND: Brown slightly sand	y gravelly clay.	
ADE GROUND: Orange brown gravelly clayey sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub angular of brick, flint and rubble (0.80)					E		(0.25)		angular to sul	b-rounded of brick, flint a	nd rubble	
Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub angular of brick, flint and rubble (0.80) (0.80) (0.80) (0.80) (0.80) MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint. (0.60) MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint. End of Window Sample at 4.000 MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint. End of Window Sample at 4.000 Strike Time (mins) Rest of Start End Data (min) Rest. % Sand is fine to coarse grained. Gravel is fine to coarse angular to sub-rounded, of flint. End of Window Sample AL. Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start End Data (min) Rest. % Strike Time (mins) Rest of Start (min) Rest of Start (min) Rest. % Strike Time (mins) Rest of Start (min) Rest of Start (min) Rest of Start (min) Rest (min) Rest of Star	_						2.40		MADE GROU	JND: Orange brown grav	elly clayey sand.	
a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a       a	_				-		8		Sand is fine to	o coarse grained. Gravel	is fine to coarse,	
3	_						8			o angular of brick, finit a		
ADDE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of fint. MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of fint. MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of fint. General Remarks 1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of fint. End of Window Sample Run 1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion	-				-							
3       3.20         MADE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         4       MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         General Remarks       1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Water Strike       Window Sample Run         Strike       Ime (mins)       Rose to       Start       End       Dia. (mm)       Res. %         10       Ontractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Strike       Ime (mins)       Rose to       Start       End       Dia. (mm)       Res. %         10       100       2.00       78       90       3.00       4.00       67       100	-				-		(0.80)					
A       3.20         A       3.20         A       A         B       A         B       A         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B	3				E		8					
And DE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         And DE GROUND: Orange brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         And DE GROUND: Orange brown slightly clayey slightly gravel is fine to coarse grained. Gravel is fine to coarse grained. Gravel is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         And DE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Beneral Remarks       1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion         Strike       Time (mins)       Rose to       Start       End         100       200       78       90         3.80       1.00       97       90         3.80       3.80       1.00       97       90							8					
Image: Service of Cound Carge Drown Carge Startuy gravel.         Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Service of Cound Carge Drown Slightly Clayey Slightly gravelly sand Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Service of Cound Carge Drown Slightly Clayey Slightly gravelly sand Sand is fine to coarse grained. Gravel is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Service of Cound Carge Drown Slightly Clayey Slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Service of Cound Carge Drown Slightly Clayey Slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Service of Cound Carge Drown Slightly Clayey Slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Service of Cound Carge Drown Slightly Clayey Slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         Image: Strike of Cound Carge Drown Slightly Clayer Slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse.         Image: Strike of Cound Carge Drown Slightly Clayer Slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse.         Image: Strike of Carge Drown Slightly Clayer Slig	E						3.20			IND: Orango brown alou	av sandy group	-)/////
General Remarks       1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Water Strike       Water Strike       Window Sample Run         Strike       Time (mins)       Rose to       0.00       1.00       87       89         10       1.00       2.00       3.00       1.00       87       85         10       1.00       2.00       78       90       100       100	E						8		Sand is fine to	o coarse grained. Gravel	is fine to coarse,	
Image: second	E				E		8		angular to sul	b-rounded, of flint.		
A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A       A	E						(0.60)					
General Remarks       3.80       3.80       MADE GROUND: Orange brown slightly clayey slightly gravelly sand. Sand is fine to coarse grained. Gravel is fine to coarse, angular to sub-rounded, of flint.         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Water Strike       Water Strike       Window Sample Run         Strike       Time (mins)       Rose to       Start       End       Dia. (mm)       Rec. %         100       1.00       2.00       78       90       3.00       4.00       67       85         3.00       4.00       67       100       67       100       67       100							8					
A       3.80       (0.20)         A       (0.20)       4.00         A       A       A         Beneral Remarks       A       A         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Strike       Mase to start       End       Dia. (mm)       Rec. %         100       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       1.00       67       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90       90	E						8					
General Remarks       Vater Strike       Window Sample at 4.00m         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Water Strike       Window Sample Run         Strike       Time (mins)       Rose to       Start       End       Dia. (mm)       Rec. %         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to       Strike       Time (mins)       Rose to       Start       End       Dia. (mm)       Rec. %         3.00       4.00       67       100       100       87       85	E						3.80		MADE GROU	JND: Orange brown sligh	tly clayey slightly	
4     4.00     End of Window Sample at 4.00m     P/X/V/A       General Remarks     Water Strike     Window Sample Run       1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion     Strike     Time (mins)     Rose to     Start     End     Dia. (mm)     Rec. %       2.00     3.00     4.00     67     85       3.00     4.00     67     100	F .						(0.20)		fine to coarse	. Sand is fine to coarse g , angular to sub-rounded	rained. Gravel is I, of flint.	
General Remarks       Water Strike       Window Sample Run         1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion       Strike       Time (mins)       Rose to       Start       End       Dia. (mm)       Rec. %         10       1.00       2.00       78       90         10       2.00       3.00       67       85         10       1.00       67       100	4					<u></u>	4.00			End of Window Sample at 4.	00m	
1) Contractor - Stunt Drilling Ltd 2) Area scanned with CAT Scan prior to commencement 3) Backfilled upon completion     Image: Co	Gene	eral Remarks	1	L	<u> </u>		1	-	Water Strike	Rose to Start F	dow Sample Run	Rec. %
2.00     3.00     67     85       3.00     4.00     67     100	1) C com	ontractor - Stunt mencement 3) B	Drilling Ltd 2 Backfilled upor	) Area scanned with n completion	h CAT	Scan	prior to			0.00 1. 1.00 2.	00 87 00 78	85 90
				· - F						2.00 3. 3.00 4.	00 67 00 67	85 100





# Appendix 3 : Drilling Parameters Records

Fontmell Close, St Albans			Driller	Forkers
			Rig Type	C6
Site Record of Rotary Borehole	Investigation	s	Casing dia (mm)	150
			Drill Bit Size (mm)	110
Borehole Number: BH201	Date: 07	/12/15	Vert/Inc (°)	11

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(m)	Rate (s)	70 Teetamo	(RPM)	(BAR)	(BAR)	(m)	Coology	Analysis
0.0	260	100	63	50	9	26	Concrete	260
0.5	90	100	63	50	9	26	Concrete	90
1.0	190	100	63	50	9	26	Concrete	190
1.5	234	100	63	50	9	26	Concrete	234
2.0	570	100	63	50	9	26	Concrete	570
2.5	20	100	63	50	9	26	Concrete	20
3.0	10	100	63	50	9	26	Ash Fill	10
3.5	10	100	63	50	9	26	Ash Fill	10
4.0	21	10	63	50	9	26	Ash Fill	21
4.5	80	10	63	50	9	26	Ash Fill	80
5.0	81	10	63	50	9	26	Ash Fill	81
5.5	20	10	63	50	9	26	Ash Fill	20
6.0	73	10	63	50	9	26	Ash Fill	73
0.5	81	10	63	50	9	26	Ash Fill	81
7.0	337	10	63	50	9	26	ASN FIII	337
7.5	3/5	20	63	50	9	26	Sandy clay	375
8.0	70	20	63	50	9	26	Sandy clay	70
8.5	118	20	63	50	9	26	Sandy clay	118
9.0	340	20	63	50	9	20	Sandy clay	340
9.5	82	20	63	50	9	26	Sandy clay	82
10.0	20	100	63	50	9	20	Sand	20
10.5	21	100	63	50	9	20	Sand	21
11.0	139	100	63	50	9	26	Sand	139
11.5	40	100	63	50	9	20	Sand	40
12.0	41	100	63	50	9	20	Sand	41
12.0	110	100	03	50	9	20	Sallu	110
13.0	112	100	63	50	9	20	Sand	112
13.5	100	100	63	50	9	20	Sand	100
14.0	203	100	62	50	9	20	Sand	203
14.0	1/0	100	63	50	9	20	Sand	440
15.0	242	100	62	50	9	20	Sand	242
16.0	180	100	63	50	9	20	Sand	189
16.5	170	100	63	50	9	20	Sand	170
17.0	3655	100	63	50	9	20	Gravel	3655
17.0	1000	100	63	50	9	20	Sand	1000
18.0	65	100	63	50	g	26	Sand	65
18.5	27	100	63	50	9	26	Sand	27
19.0	62	100	63	50	9	26	Chalk	62
19.5	127	100	63	50	9	26	Chalk	127
20.0	55	100	63	50	9	26	Chalk	55
20.5	100	100	63	50	9	26	Chalk	100
21.0	157	100	63	50	9	26	Chalk	157
21.5	72	100	63	50	9	26	Chalk	72
22.0	80	100	63	50	9	26	Chalk	80
22.5	55	100	63	50	9	26	Chalk	55
23.0	50	100	63	50	9	26	Chalk	50
23.5	40	100	63	50	9	26	Chalk	40
24.0	42	100	63	50	9	26	Chalk	42
24.5	45	100	63	50	9	26	Chalk	45
25.0	45	100	63	50	9	26	Chalk	45
25.5	40	100	60	50	õ	20	Chall	40

Fontmell Close, St Albans			Driller	Forkers
			Rig Type	C6
Site Record of Rotary Borehole	Investigation	S	Casing dia (mm)	150
			Drill Bit Size (mm)	110
Borehole Number: BH202	Date: 09	9/12/15	Vert/Inc (°)	20

Meterage	Pene	a( D )	Rotary Speed	Applied Load	Air Pressure	Casing	2	Provisional
(m)	Rate (s)	% Returns	(RPM)	(BAR)	(BAR)	(m)	Geology	Analysis
0.0	260	100	83	50	9	30	Concrete	260
0.5	375	100	83	50	9	30	Concrete	375
1.0	266	100	83	50	9	30	Concrete	266
1.5	86	100	83	50	9	30	Concrete	86
2.0	112	100	83	50	9	30	Ash Fill	112
2.5	190	100	83	50	9	30	Ash Fill	190
3.0	100	100	83	50	9	30	Ash Fill	100
3.5	13	100	83	50	ğ	30	Ash Fill	13
4.0	60	100	83	50	9	30	Ash Fill	60
4.5	70	100	83	50	ğ	30	Ash Fill	70
5.0	68	50	83	50	9	30	Clay	68
5.5	71	50	83	50	ğ	30	Clay	71
6.0	42	50	83	50	ğ	30	Clay and Chalk	42
6.5	86	50	83	50	ğ	30	Clay and Chalk	86
7.0	80	50	83	50	ğ	30	Clay and Chalk	80
7.5	111	50	83	50	9	30	Clay and Chalk	111
8.0	156	50	83	50	ğ	30	Clay and Chalk	156
8.5	151	50	83	50	9	30	Sandy Gravel	151
9.0	170	50	83	50	9	30	Sandy Gravel	170
9.5	128	50	83	50	9	30	Sandy Gravel	128
9.5	120	50	83	50	9	30	Sandy Gravel	164
10.0	104	50	00	50	9	20	Sandy Gravel	127
11.0	137	50	00	50	9	30	Sandy Gravel	
11.0	230	50	00	50	9	30	Sandy Gravel	
12.0	190	50	00	50	9	30	Salluy Glavel	272
12.0	2/2	50	00	50	9	30	Sandy Clay	212
12.5	340	50	63 92	50	9	30	Salidy Clay	340
13.0	260	50	63	50	9	30	Salidy Clay	260
13.5	220	50	83	50	9	30	Sandy Clay	220
14.0	324	10	63	50	9	30	Salidy Clay	324
14.5	270	10	83	50	9	30	Sandy Clay	270
15.0	200	100	83	50	9	30	Sandy Clay	200
15.5	67	100	83	50	9	30	Sandy Clay	67
16.0	60	100	83	50	9	30	Sandy Clay	60
16.5	30	100	83	50	9	30	Sandy Clay	30
17.0	36	100	83	50	9	30	Sandy Clay	36
17.5	21	100	83	50	9	30	Sandy Clay	21
18.0	31	100	83	50	y 9	30	Sandy Clay	31
18.5	42	100	83	50	y 9	30	Sandy Clay	42
19.0	44	100	83	50	y 9	30	Sandy Clay	44
19.5	12	100	83	50	9	30	Sandy Clay	12
20.0	29	100	83	50	9	30	Sandy Clay	29
20.5	- 32	100	83	50	9	30	Sandy Clay	32
21.0	42	100	83	50	9	30	Sandy Clay	42
21.5	27	100	83	50	9	30	Sandy Clay	27
22.0	62	100	83	50	9	30	Sandy Gravel	62
22.5	135	100	83	50	9	30	Sandy Gravel	135
23.0	66	100	83	50	9	30	Sandy Gravel	66
23.5	57	100	83	50	9	30	Sandy Gravel	57
24.0	96	100	83	50	9	30	Sandy Gravel	96
24.5	118	100	83	50	9	30	Sandy Gravel	118
25.0	91	100	83	50	9	30	Sandy Gravel	91
25.5	61	100	83	50	9	30	Sandy Gravel	61
26.0	31	100	83	50	9	30	Sandy Gravel	31
26.5	74	100	83	50	9	30	Sandy Chalk	74
27.0	59	100	83	50	9	30	Firm Chalk	59
27.5	51	100	83	50	9	30	Firm Chalk	51
28.0	47	100	83	50	9	30	Firm Chalk	47
28.5	54	100	83	50	9	30	Firm Chalk	54
29.0	70	100	83	50	9	30	Firm Chalk	70
29.5	63	100	83	50	9	30	Firm Chalk	63

Fontmell Close, St Albans		Driller	Forkers
		Rig Type	C6
Site Record of Rotary Borehole	Investigations	Casing dia (mm)	150
		Drill Bit Size (mm)	110
Borehole Number: BH203	Date: 15/12/15	Vert/Inc (°)	27

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(m)	Rate (s)	70 Iteluina	(RPM)	(BAR)	(BAR)	(m)	Geology	Analysis
0.0	167	100	83	50	9	32	Concrete	167
0.5	266	100	83	50	9	32	Concrete	266
1.0	146	100	83	50	9	32	Concrete	146
1.5	155	100	83	50	9	32	Concrete	155
2.0	106	100	83	50	9	32	Concrete	106
2.5	151	100	83	50	9	32	Concrete	151
3.0	9	100	83	50	9	32	Ash Fill	9
3.5	8	100	83	50	9	32	Ash Fill	8
4.0	9	100	83	50	9	32	Ash Fill	9
4.5	279	100	83	50	9	32	Ash Fill	279
5.0	29	100	83	50	9	32	Ash Fill	29
5.5	8	100	83	50	9	32	Ash Fill	8
6.0	8	100	83	50	9	32	Ash Fill	8
6.5	10	100	83	50	9	32	Ash Fill	10
7.0	48	100	83	50	9	32	Ash Fill	48
7.5	9	100	83	50	9	32	Sandy Clay and Gravel	9
8.0	37	100	83	50	9	32	Sandy Clay and Gravel	37
8.5	226	100	83	50	9	32	Sandy Clay and Gravel	226
9.0	154	100	83	50	9	32	Sandy Clay and Gravel	154
9.5	70	100	83	50	9	32	Sandy Clay and Gravel	70
10.0	155	100	83	50	9	32	Sandy Clay and Gravel	155
10.5	67	100	83	50	9	32	Sandy Clay and Gravel	67
11.0	95	100	83	50	9	32	Sandy Clay and Gravel	95
11.5	38	100	83	50	9	32	Sandy Clay and Gravel	38
12.0	38	100	83	50	9	32	Sandy Clay and Gravel	38
12.5	26	100	83	50	9	32	Sandy Clay and Gravel	26
13.0	61	100	83	50	9	32	Sandy Clay and Gravel	61
13.5	28	100	83	50	9	32	Sandy Clay and Gravel	28
14.0	69	100	83	50	9	32	Sandy Clay and Gravel	69
14.5	105	100	83	50	9	32	Sandy Clay and Gravel	105
15.0	101	100	83	50	9	32	Sandy Clay and Gravel	101
15.5	95	100	83	50	9	32	Sandy Clay and Gravel	95
16.0	43	100	83	50	9	32	Sandy Clay and Gravel	43
16.5	93	100	83	50	9	32	Sandy Clay and Gravel	93
17.0	105	100	83	50	9	32	Sandy Clay and Gravel	105
17.5	21	100	83	50	9	32	Sandy Clay and Gravel	21
18.0	92	100	83	50	9	32	Sandy Clay and Gravel	92
18.5	161	100	83	50	9	32	Sandy Clay and Gravel	161
19.0	273	100	83	50	9	32	Sandy Clay and Gravel	273
19.5	38	100	83	50	9	32	Sandy Clay and Gravel	38
20.0	99	100	83	50	9	32	Sandy Clay and Gravel	99
20.5	121	100	83	50	9	32	Sandy Clay and Gravel	121
21.0	95	100	83	50	9	32	Sandy Clay and Gravel	95
21.5	25	100	83	50	9	32	Sandy Clay and Gravel	25
22.0	55	100	83	50	9	32	Sandy Clay and Gravel	55
22.5	139	100	83	50	9	32	Sandy Clay and Gravel	139
23.0	132	100	83	50	9	32	Sandy Clay and Gravel	132
23.5	95	100	83	50	9	32	Sandy Clay and Gravel	95
24.0	55	100	83	50	9	32	Sandy Clay and Gravel	55
24.5	139	100	83	50	9	32	Sandy Clay and Gravel	139
25.0	132	100	83	50	9	32	Sandy Clay and Gravel	132
25.5	95	100	83	50	9	32	Sandy Clay and Gravel	95
26.0	55	100	83	50	9	32	Sandy Clay and Gravel	55
26.5	135	100	83	50	9	32	Sandy Clay and Gravel	135
27.0	103	100	83	50	9	32	Sandy Clav and Gravel	103
27.5	1228	100	83	50	9	32	Flint	1228
28.0	5580	100	83	50	9	32	Flint	5580
28.5	55	100	83	50	9	32	Sand and Gravel	55
29.0	132	100	83	50	9	32	Sand and Gravel	132
29.5	131	100	83	50	9	32	Sand and Gravel	131
30.0	190	100	83	50	9	32	Sand and Gravel	190
30.5	132	100	83	50	9	32	Sand and Gravel	132
31.0	133	100	83	50	9	32	Firm Chalk	133
31.5	208	100	83	50	9	32	Firm Chalk	208
0.10	200							
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Site Record of Rotary Borehole Investigations

	Driller	Forkers		
	Rig Type			
vestigations	Casing dia (mm)	150		
	Drill Bit Size (mm)	110		
Date: 17/12/15	Vert/Inc (°)	30		

Borehol	e Number:	BH204	Date:	17/12/15	-	Vert/Inc	(°)	30
						-		
Meterage	Pene Poto (c)	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(11)	1300	100	(KPIVI) 83	(DAR) 50	(BAR) 9	(11)	Concrete	Analysis 1300
0.5	630	100	83	50	9	34	Concrete	
1.0	741	100	83	50	9	34	Concrete	
1.5	400	100	83	50	9	34	Concrete	
2.0	149	100	83	50	9	34	Concrete	
2.5	161	100	83	50	9	34	Concrete	161
3.0	22	100	83	50	9	34	Ash Fill	<u> </u>
4.0	5	100	83	50	9	34	Ash Fill	5
4.5	5	100	83	50	9	34	Ash Fill	5
5.0	5	100	83	50	9	34	Ash Fill	5
5.5	5	100	83	50	9	34	Ash Fill	5
6.0	10	100	83	50	9	34	Ash Fill	10
6.5	10	100	83	50	9	34	Ash Fill	10
7.0	10	100	83	50	9	34	Sandy Gravel	10
8.0	10	100	83	50	9	34	Sandy Gravel	10
8.5	10	100	83	50	9	34	Sandy Gravel	10
9.0	48	100	83	50	9	34	Sandy Gravel	48
9.5	14	100	83	50	9	34	Sandy Gravel	14
10.0	10	100	83	50	9	34	Sandy Gravel	10
10.5	18	100	83	50	9	34	Sandy Gravel	18
11.0	20	100	83	50	9	34	Sandy Gravel	20
12.0	79	100	83	50	9	34	Sandy Gravel	79
12.5	81	100	83	50	9	34	Sandy Gravel	
13.0	107	100	83	50	9	34	Sandy Gravel	
13.5	73	100	83	50	9	34	Sandy Gravel	
14.0	88	100	83	50	9	34	Sandy Gravel	88
14.5	56	100	83	50	9	34	Sandy Gravel	56
15.5	14	100	83	50	9	34	Sandy Gravel	14
16.0	16	100	83	50	9	34	Sandy Gravel	16
16.5	42	100	83	50	9	34	Sandy Gravel	42
17.0	43	100	83	50	9	34	Sandy Gravel	43
17.5	15	100	83	50	9	34	Sandy Gravel	15
18.0	30	100	83	50	9	34	Sandy Gravel	30
10.5	76 41	100	83	50	9	34	Sandy Gravel	41
19.5	31	100	83	50	9	34	Sandy Gravel	31
20.0	36	100	83	50	9	34	Sandy Gravel	36
20.5	22	100	83	50	9	34	Sandy Gravel	22
21.0	42	100	83	50	9	34	Sandy Gravel	42
21.5	68	100	83	50	9	34	Sandy Gravel	
22.0	78	100	83	50	9	34	Sandy Gravel	
23.0	44	100	83	50	9	34	Sandy Gravel	44
23.5	80	100	83	50	9	34	Sandy Gravel	80
24.0	30	100	83	50	9	34	Sandy Gravel	30
24.5	18	100	83	50	9	34	Sandy Gravel	18
25.0	14	100	83	50	9	34	Sandy Gravel	14
25.5	1 15	100	83 83	50	9	34	Sandy Gravel	21
26.5	19	100	83	50	9	34	Sandy Gravel	19
27.0	23	100	83	50	9	34	Sandy Gravel	23
27.5	24	100	83	50	9	34	Sandy Gravel	24
28.0	69	100	83	50	9	34	Sandy Gravel	
28.5	72	100	83	50	9	34	Sandy Chalk	72
29.0	47	100	83	50	9	34	Chalk	47
29.5 30.0	37	100	03 83	50	9	34	Chalk	- 37
30.5	42	100	83	50	9	34	Chalk	42
31.0	52	100	83	50	9	34	Chalk	52
31.5	60	100	83	50	9	34	Chalk	60
32.0	66	100	83	50	9	34	Chalk	
32.5	72	100	83	50	9	34	Chalk	72
33.0	48	100	83	50	9	34	Chalk	48
JJ.5	70	100	03	00	Я	34	Unalk	70

Fontmell Close, St Albans		Driller	Forkers
		Rig Type	C6
Site Record of Rotary Borehole	e Investigations	Casing dia (mm)	150
		Drill Bit Size (mm)	110
Borehole Number: BH205	Date: 07/01/16	Vert/Inc (°)	22

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(m)	Rate (S)	100	(RPIVI) 83	(BAR) 50	(BAR)	(m) 34	Concrete	Analysis
0.0	544	100	83	50	9	34	Concrete	544
1.0	340	100	83	50	9	34	Concrete	340
1.5	139	100	83	50	9	34	Concrete	139
2.0	122	100	83	50	9	34	Concrete	122
2.5	125	100	83	50	9	34	Concrete	125
3.0	140	100	83	50	9	34	Concrete	140
3.5	6	20	83	50	9	34	Black Ashy Fill	6
4.0	7	20	83	50	9	34	Black Ashy Fill	7
4.5	7	20	83	50	9	34	Black Ashy Fill	7
5.0	7	20	83	50	9	34	Black Ashy Fill	7
5.5	/	20	83	50	9	34	Black Ashy Fill	/
6.0	7	20	83	50	9	34	Black Ashy Fill	7
0.5	7	20	03	50	9	34	Black Ashy Fill	7
7.0	7	100	83	50	9	34	Sand Gravel Clay	7
8.0	46	100	83	50	g	34	Sand, Gravel, Clay	46
8.5	80	100	83	50	9	34	Sand Gravel Clay	80
9.0	107	100	83	50	9	34	Sand, Gravel, Clay	107
9.5	64	100	83	50	9	34	Sand, Gravel, Clay	64
10.0	36	100	83	50	9	34	Sand, Gravel, Clay	36
10.5	27	100	83	50	9	34	Sand, Gravel, Clay	27
11.0	65	100	83	50	9	34	Sand, Gravel, Clay	65
11.5	130	100	83	50	9	34	Sand, Gravel, Clay	130
12.0	47	100	83	50	9	34	Sand, Gravel, Clay	47
12.5	90	100	83	50	9	34	Sand, Gravel, Clay	90
13.0	156	100	83	50	9	34	Sand, Gravel, Clay	156
13.5	70	100	83	50	9	34	Sand, Gravel, Clay	70
14.0	134	100	83	50	y o	34	Sand, Gravel, Clay	134
14.5	43	100	83	50	y Q	34	Sand, Gravel, Clay	43
15.0	55	100	03	50	9	34	Sand, Gravel, Clay	55
16.0	14	100	83	50	9	34	Sand Gravel Clay	14
16.5	21	100	83	50	9	34	Sand, Gravel, Clay	21
17.0	24	100	83	50	9	34	Sand Gravel Clay	24
17.5	30	100	83	50	9	34	Sand, Gravel, Clay	30
18.0	17	100	83	50	9	34	Sand, Gravel, Clay	17
18.5	30	100	83	50	9	34	Sand, Gravel, Clay	30
19.0	39	100	83	50	9	34	Sand, Gravel, Clay	39
19.5	58	100	83	50	9	34	Sand, Gravel, Clay	58
20.0	102	100	83	50	9	34	Sand, Gravel, Clay	102
20.5	82	100	83	50	9	34	Light Grey Chalk	82
21.0	105	100	83	50	9	34	Light Grey Chalk	105
21.5	81	100	83	50	9	34	Light Grey Chalk	81
22.0	62	100	83	50	y o	34	Light Grey Chalk	62
22.5	43	100	83	50	9	34	Light Grey Chaik	43
23.0	33	100	03	50	9	34	Clay, Chalk Traces	21
23.5	20	100	83	50	9	34	Clay, Chaik Traces	20
24.5	37	100	83	50	9	34	Clay, Chalk Traces	37
25.0	35	100	83	50	9	34	Clay, Chalk Traces	35
25.5	27	100	83	50	9	34	Clay, Chalk Traces	27
26.0	58	100	83	50	9	34	Pale Chalk, Clay parts	58
26.5	32	100	83	50	9	34	Pale Chalk, Clay parts	32
27.0	41	100	83	50	9	34	Pale Chalk, Clay parts	41
27.5	34	100	83	50	9	34	Pale Chalk, Clay parts	34
28.0	58	100	83	50	9	34	Firm White Chalk, Flint Patches	58
28.5	61	100	83	50	9	34	Firm White Chalk, Flint Patches	61
29.0	43	100	83	50	9	34	Firm White Chalk, Flint Patches	43
29.5	61	100	83	50	9	34	Firm White Chalk, Flint Patches	61
30.0	55	100	83	50	9	34	Firm White Chalk, Fint Patches	55
30.5	20	100	03 82	50	9	34	Firm White Chalk, Fint Patches	
31.0	40	100	83	50	9 Q	34	Firm White Chalk, Flint Patches	40
32.0	38	100	83	50	9	34	Firm White Chalk Flint Patches	38
32.5	32	100	83	50	9	34	Firm White Chalk, Flint Patches	32
33.0	34	100	83	50	9	34	Firm White Chalk, Flint Patches	34
33.5	35	100	83	50	9	34	Firm White Chalk, Flint Patches	35

Borehole Number: BH206

Site Record of Rotary Borehole Investigations

	Driller	Forkers
	Rig Type	C6
Investigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 08/01/16	Vert/Inc (°)	25

Meterage	Pene Pete (c)	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
0.0	125	100	(KPIVI) 83	(BAR) 50	(BAR) 9	40	Concrete	Analysis
0.5	241	100	83	50	9	40	Concrete	241
1.0	147	100	83	50	9	40	Concrete	147
1.5	70	100	83	50	9	40	Concrete	70
2.0	64	100	83	50	9	40	Concrete	64
2.5	66	100	83	50	9	40	Concrete	66
3.0	/5	100	83	50	9	40	Concrete	2
4.0	4	20	83	50	9	40	Damp Ash Fill	4
4.5	4	20	83	50	9	40	Damp Ash Fill	4
5.0	4	20	83	50	9	40	Damp Ash Fill	4
5.5	10	20	83	50	9	40	Damp Ash Fill	10
6.0	11	20	83	50	9	40	Damp Ash Fill	11
6.5	18	20	83	50	9	40	Light Brown Sand, Gravel	18
7.0	36	20	83	50	9	40	Light Brown Sand, Gravel	36
8.0	129	100	83	50	9	40	Sand Gravel Hard Firm	129
8.5	97	100	83	50	9	40	Sand, Gravel, Hard, Firm	97
9.0	102	100	83	50	9	40	Sand, Gravel, Hard, Firm	102
9.5	95	100	83	50	9	40	Sand, Gravel, Hard, Firm	95
10.0	54	100	83	50	9	40	Sand, Gravel, Hard, Firm	54
10.5	57	100	83	50	9	40	Sand, Gravel, Hard, Firm	57
11.0	93	100	83	50	9	40	Sand, Gravel, Hard, Firm	93
11.5	39	100	83	50	9	40	Sand, Gravel, Hard, Firm	39
12.0	74	100	83	50	9	40	Stiff Brown Clay, Gravel	43 74
13.0	56	100	83	50	9	40	Stiff Brown Clay, Gravel	56
13.5	21	100	83	50	9	40	Stiff Brown Clay, Gravel	21
14.0	42	100	83	50	9	40	Stiff Brown Clay, Gravel	42
14.5	31	100	83	50	9	40	Stiff Brown Clay, Gravel	31
15.0	48	100	83	50	9	40	Light Brown Grey Sand, Gravel, Chalk Traces	48
15.5	31	100	83	50	9	40	Light Brown Grey Sand, Gravel, Chalk Traces	31
16.0	30 51	100	83	50	9	40	Light Brown Grey Sand, Gravel, Chalk Traces	51
17.0	150	100	83	50	9	40	Light Brown Grey Sand, Gravel, Chalk Traces	150
17.5	82	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	82
18.0	33	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	33
18.5	38	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	38
19.0	51	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	51
19.5	45	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	45
20.0	53	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	53
20.5	49	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	49
21.0	48	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	48
22.0	37	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	37
22.5	47	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	47
23.0	87	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	87
23.5	79	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	79
24.0	138	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	138
24.5	71	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	71
25.0	82	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	82
26.0	67	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	67
26.5	33	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	33
27.0	46	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	46
27.5	44	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	44
28.0	34	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	34
28.5	48	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	48
29.0	35	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	35
29.5	20 42	100	03 83	50	9	40	Firm Pale White Chalk, Small Firm Parts	42
30.0	57	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	57
31.0	70	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	70
31.5	34	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	34
32.0	54	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	54
32.5	37	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	37
33.0	40	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	40
33.5	24	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	24
34.0	39 42	100	83	50	3	40	Firm Pale White Chalk, Small Flint Parts	42
35.0	29	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	29
35.5	35	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	35
36.0	52	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	52
36.5	30	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	30
37.0	24	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	24
37.5	22	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	22
38.0	17	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	17
30.5	15	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	15
39.5	20	100	83	50	9	40	Firm Pale White Chalk, Small Flint Parts	20

Borehole Number: BH207

Site Record of Rotary Borehole Investigations

100 100

39.0 39.5 39 34 83 83 50 50

	Driller	Forkers
	Rig Type	C6
vestigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 11/01/16	Vert/Inc (°)	20

Provisional Analysis

Meterage (m)	Pene Rate (s)	% Returns	Rotary Speed (RPM)	Applied Load (BAR)	Air Pressure (BAR)	Casing (m)	Geology
0.0	195	100	83	50	9	40	Concrete
0.5	112	100	83	50	9	40	Concrete
1.0	93	100	83	50	9	40	Concrete
1.5	50	100	83	50	9	40	Concrete
2.0	97	100	83	50	9	40	Concrete
2.5	138	100	83	50	9	40	Concrete
3.0	155	100	83	50	9	40	Concrete
3.5	5	20	83	50	9	40	Black Ash Muddy Fill
4.0	5	20	83	50	9	40	Black Ash Muddy Fill
4.5	5	20	83	50	9	40	Black Ash Muddy Fill
5.0	5	20	83	50	9	40	Black Ash Muddy Fill
5.5	5	20	83	50	9	40	Black Ash Muddy Fill
6.0	5	20	83	50	9	40	Black Ash Muddy Fill
6.5	5	20	83	50	9	40	Black Ash Muddy Fill
7.0	5	20	83	50	9	40	Black Ash Muddy Fill
7.5	5	100	83	50	9	40	Soft Brown Sand
8.0	53	100	83	50	9	40	Soft Brown Sand
8.5	36	100	83	50	9	40	Soft Brown Sand
9.0	50	100	83	50	9	40	Hard Firm Sand, Grave
9.5	54	100	83	50	9	40	Hard Firm Sand, Grave
10.0	31	100	83	50	9	40	Hard Firm Sand, Grave
10.5	49	100	83	50	9	40	Hard Firm Sand, Grave
11.0	21	100	83	50	9	40	Hard Firm Sand, Grave
11.5	24	100	83	50	9	40	Hard Firm Sand, Grave

3.0	50	100	05	50	3	40	Flaid Film Sand, Glaver	50
9.5	54	100	83	50	9	40	Hard Firm Sand, Gravel	54
10.0	31	100	83	50	9	40	Hard Firm Sand, Gravel	31
10.5	49	100	83	50	9	40	Hard Firm Sand, Gravel	49
11.0	21	100	83	50	9	40	Hard Firm Sand, Gravel	21
11.5	24	100	83	50	9	40	Hard Firm Sand, Gravel	24
12.0	22	100	83	50	9	40	Light Brown Clay.Soft Sand	22
12.5	18	100	83	50	9	40	Light Brown Clay.Soft Sand	18
13.0	19	100	83	50	9	40	Light Brown Clay Soft Sand	19
13.5	20	100	83	50	9	40	Light Brown Clay Soft Sand	20
14.0	24	100	83	50	9	40	Light Brown Clay Soft Sand	24
14.5	20	100	83	50	9	40	Light Brown Clay Soft Sand	20
15.0	91	100	83	50	9	40	Firm Hard Clay, Sand	91
15.5	26	100	83	50	9	40	Firm Hard Clay, Sand	26
16.0	124	100	83	50	9	40	Firm Hard Clay, Sand	124
16.5	63	100	83	50	9	40	Sandy Chalk Small Gravel	63
17.0	81	100	83	50	ğ	40	Sandy Chalk, Small Gravel	81
17.0	22	100	83	50	ğ	40	Sandy Chalk, Small Gravel	22
18.0	29	100	83	50	ğ	40	Firm Chalk Small Flint Parts	29
18.5	38	100	83	50	9	40	Firm Chalk, Small Flint Parts	38
10.0	33	100	83	50	9	40	Firm Chalk, Small Flint Parts	33
19.5	26	100	83	50	ğ	40	Firm Chalk, Small Flint Parts	26
20.0	20	100	00	50	0	40	Firm Chalk, Small Flint Parts	20
20.0	23	100	83	50	9	40	Firm Chalk, Small Flint Parts	27
20.0	23	100	83	50	9	40	Firm Chalk, Small Flint Parts	23
21.0	20	100	83	50	9	40	Firm Chalk, Small Flint Parts	20
22.0	31	100	83	50	9	40	Firm Chalk, Small Flint Parts	31
22.0	32	100	83	50	9	40	Firm Chalk, Small Flint Parts	32
23.0	29	100	83	50	ğ	40	Firm Chalk, Small Flint Parts	29
23.5	26	100	83	50	9	40	Firm Chalk, Small Flint Parts	26
24.0	20	100	83	50	9	40	Firm Chalk, Small Flint Parts	20
24.5	26	100	83	50	ğ	40	Firm Chalk, Small Flint Parts	26
25.0	32	100	83	50	9	40	Firm Chalk, Small Flint Parts	32
25.5	35	100	83	50	9	40	Firm Chalk, Small Flint Parts	35
26.0	30	100	83	50	9	40	Firm Chalk, Small Flint Parts	30
26.5	35	100	83	50	9	40	Firm Chalk, Small Flint Parts	35
27.0	38	100	83	50	9	40	Firm Chalk Small Flint Parts	38
27.5	36	100	83	50	9	40	Firm Chalk Small Flint Parts	36
28.0	33	100	83	50	9	40	Firm Chalk, Small Flint Parts	33
28.5	32	100	83	50	9	40	Firm Chalk, Small Flint Parts	32
29.0	42	100	83	50	9	40	Firm Chalk, Small Flint Parts	42
29.5	40	100	83	50	9	40	Firm Chalk, Small Flint Parts	40
30.0	36	100	83	50	9	40	Firm Chalk, Small Flint Parts	36
30.5	62	100	83	50	9	40	Firm Chalk, Small Flint Parts	62
31.0	13	100	83	50	9	40	Firm Chalk, Small Flint Parts	13
31.5	27	100	83	50	9	40	Firm Chalk, Small Flint Parts	27
32.0	38	100	83	50	9	40	Firm Chalk, Small Flint Parts	38
32.5	35	100	83	50	9	40	Firm Chalk, Small Flint Parts	35
33.0	42	100	83	50	9	40	Firm Chalk, Small Flint Parts	42
33.5	35	100	83	50	9	40	Firm Chalk, Small Flint Parts	35
34.0	38	100	83	50	9	40	Firm Chalk, Small Flint Parts	38
34.5	36	100	83	50	9	40	Firm Chalk, Small Flint Parts	36
35.0	70	100	83	50	9	40	Firm Chalk, Small Flint Parts	70
35.5	41	100	83	50	9	40	Firm Chalk, Small Flint Parts	41
36.0	42	100	83	50	9	40	Firm Chalk, Small Flint Parts	42
36.5	37	100	83	50	9	40	Firm Chalk, Small Flint Parts	37
37.0	28	100	83	50	9	40	Firm Chalk, Small Flint Parts	28
37.5	28	100	83	50	9	40	Firm Chalk, Small Flint Parts	28
38.0	54	100	83	50	9	40	Firm Chalk, Small Flint Parts	54
38.5	38	100	83	50	9	40	Firm Chalk, Small Flint Parts	38
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Firm Chalk, Small Flint Parts Firm Chalk, Small Flint Parts

47.0 47.5 91 81 80 80 83 83 50 50 48 48

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Firm Chalk Firm Chalk

Borehole Number: BH208

Site Record of Rotary Borehole Investigations

Date: 11/12/15

Driller	For	kers
Rig Type	C	26
Casing dia (mm)	1	50
Drill Bit Size (mm)	1	10
Vert/Inc (°)	,	V

Meterage	Pene	0/ Deturne	Rotary Speed	Applied Load	Air Pressure	Casing	Caslant	Provisional
(m)	Rate (s)	% Returns	(RPM)	(BAR)	(BAR)	(m)	Geology	Analysis
0.0	330	100	83	50	9	48	Concrete	330
0.5	270	100	83	50	õ	/18	Concrete	270
0.5	270	100	00	50	0	40	Concrete	210
1.0	222	100	83	50	9	48	Concrete	222
1.5	210	100	83	50	9	48	Concrete	210
2.0	222	100	83	50	9	48	Concrete	222
2.5	104	100	83	50	9	48	Concrete	104
3.0	56	100	83	50	Q	48	Concrete	56
5.0	30	100	00	50	3	40	Concrete	
3.5	49	100	83	50	9	48	Concrete	49
4.0	17	100	83	50	9	48	Ash Fill	17
4.5	10	100	83	50	9	48	Ash Fill	10
5.0	22	100	83	50	9	48	Ash Fill	22
5.0	22	100	00	50	3	40		22
5.5	40	100	83	50	g	48	Ash Fill	40
6.0	6	100	83	50	9	48	Ash Fill	6
6.5	53	100	83	50	9	48	Ash Fill	53
7.0	70	100	00	50	ő	40	Ach Fill	70
7.0	70	100	63	50	9	40	ASII FIII	70
7.5	40	100	83	50	9	48	Ash Fill	40
8.0	47	100	83	50	9	48	Ash Fill	47
8.5	70	100	83	50	9	48	Ash Fill	70
0.0	22	100	00	50	ő	10	Ach Fill	22
9.0	32	100	63	50	9	40	ASII FIII	32
9.5	94	100	83	50	9	48	Ash Fill	94
10.0	32	100	83	50	9	48	Ash Fill	32
10.5	93	100	83	50	9	48	Ash Fill	93
11.0	14	100	00	50	ő	40	Ach Fill	1.4
11.0	14	100	63	50	9	40	ASII FIII	14
11.5	8	100	83	50	g	48	Ash Fill	8
12.0	10	100	83	50	9	48	Ash Fill	10
12.5	5	100	83	50	9	48	Ash Fill	5
13.0	, ,	10	82	50	õ	10	Very Soft Drilling Plack Domo Fill	2
13.0	2	10	03	50	3	+0	Very Son Drining - Black Damp Fill	2
13.5	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
14.0	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
14.5	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
15.0	-	10	82	50	õ	.0	Very Soft Drilling Plack Domp Fill	2
10.0	2	10	03	50	3	+0	Very Son Drining - Black Damp Fill	2
15.5	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
16.0	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
16.5	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
17.0	-	10	00	E0	č	40	Von/ Soft Drilling Diack Damp Fill	2
17.0	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
17.5	2	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	2
18.0	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
18.5	3	10	83	50	Q	48	Very Soft Drilling - Black Damp Fill	3
10.0	3	10	00	50	0	40	Very Soft Drilling - Diack Damp Fill	3
19.0	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
19.5	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
20.0	3	10	83	50	9	48	Verv Soft Drilling - Black Damp Fill	3
20.5	3	10	83	50	à	48	Very Soft Drilling - Black Damp Fill	3
20.0	0	10	00	50	0	40	Very Colt Drilling Black Damp Fill	0
21.0	3	10	83	50	g	48	Very Soft Drilling - Black Damp Fill	3
21.5	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
22.0	5	10	83	50	9	48	Verv Soft Drilling - Black Damp Fill	5
22.5	5	10	83	50	Q	48	Very Soft Drilling - Black Damp Fill	5
22.0	5	10	00	50	0	40	Very Soft Drilling Black Damp Fill	5
23.0	5	10	03	50	9	40	Very Soit Dhilling - Black Damp Fill	5
23.5	5	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	5
24.0	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
24.5	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
25.0	2	10	00	50	ő	40	Very Seft Brilling Black Damp Fill	2
25.0	3	10	63	50	9	40	Very Soit Dhilling - Black Damp Fill	3
25.5	3	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	3
26.0	17	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	17
26.5	11	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	11
27.0	20	10	02	50	0	10	Very Soft Drilling Black Damp Fill	20
27.0	20	10	63	50	9	40	Very Solt Dhilling - Black Damp Fill	20
27.5	13	10	83	50	g	48	Very Soft Drilling - Black Damp Fill	13
28.0	12	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	12
28.5	17	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	17
20.0	18	10	83	50	õ	/18	Very Soft Drilling - Black Damp Fill	18
20.5	10	10	00	E0	č	40	Von/ Soft Drilling Diack Damp Fill	10
29.5	13	10	03	50	Я	48	Very Son Drilling - Black Damp Fill	13
30.0	12	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	12
30.5	17	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	17
31.0	12	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	12
31.5	26	10	83	50	õ	49	Very Soft Drilling - Black Damp Fill	26
01.0	20	10	00	50	3	40	Very Cont Drilling - Black Dallip Fill	20
32.0	42	10	83	50	Э	48	very Sort Unilling - Black Damp Fill	42
32.5	48	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	48
33.0	33	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	33
33.5	26	10	83	50	9	48	Very Soft Drilling - Black Damp Fill	26
34.0	21	80	82	50	õ	.0	Sandy Cloy	21
34.0	21	00	03	50	3	+0	Sanuy Ciay	21
34.5	26	80	83	50	9	48	Sandy Clay	26
35.0	35	80	83	50	9	48	Sandy Clay	35
35.5	21	80	83	50	9	48	Sandy Clay	21
26.0	17	00	00	E0	č	40	Sandy Clay	17
0.00	17	00	03	50	а	48	Sanuy Clay	1/
36.5	19	80	83	50	9	48	Sandy Clay	19
37.0	17	80	83	50	9	48	Sandy Clay	17
37.5	16	80	83	50	9	48	Sandy Clay	16
38.0	22	80	83	50	۵ ۵	19	Sandy Clay	22
JO.U	23	00	03	50	9	40	Sanuy Ciay	23
38.5	21	80	83	50	9	48	Sandy Clay	21
39.0	27	80	83	50	9	48	Sandy Clay	27
39.5	14	80	83	50	9	48	Sandy Clay	14
40.0	22	00	00	E0	č	40	Sandy Clay	22
40.0	23	80	83	50	9	48	Sandy Clay	23
40.5	30	80	83	50	9	48	Sandy Clay	30
41.0	23	80	83	50	9	48	Sandy Clay	23
41.5	10	80	83	50	Q	48	Sandy Clay	10
42.0	10	00	00	50	0	40	Sandy Clay	15
42.0	15	00	03	50	Э	48	Sanuy Clay	15
42.5	28	80	83	50	9	48	Sandy Clay	28
43.0	51	80	83	50	9	48	Sandy Clay	51
43.5	59	80	83	50	9	48	Sandy Clay	59
44.0	160	00	00	50		40	Eirm Challe	150
44.0	103	00	03	50	я	48		103
44.5	273	80	83	50	9	48	Firm Chalk	273
45.0	211	80	83	50	9	48	Firm Chalk	211
45.5	141	80	83	50	9	48	Firm Chalk	141
46.0	50	80	83	50	à	48	Firm Chalk	50
10.0	105	00	00	50	ŏ	40	Firm Chalk	105

Borehole Number: BH209

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Site Record of Rotary Borehole Investigations

	Driller	Forkers
	Rig Type	C6
Investigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 12/01/16	Vert/Inc (°)	28

Mataraga	Dana		Datany Coord	Applied Lood	Air Dressure	Cooing		Droutining
weterage	Perie	% Returns	Kolary Speed	Applied Load	All Pressure	Casing	Geology	Provisional
(m)	Rate (s)		(RPM)	(BAR)	(BAR)	(m)		Analysis
0.0	150	100	83	50	9	40	Concrete	150
0.5	260	100	83	50	9	40	Concrete	260
1.0	145	100	83	50	9	40	Concrete	145
1.5	61	100	83	50	9	40	Concrete	61
2.0	57	100	83	50	9	40	Concrete	57
2.5	92	100	83	50	9	40	Concrete	92
3.0	90	100	83	50	q	40	Concrete	90
2.5	94	1010	00	50	0	40	Concrete	94
3.5	5	20	00	50	0	40	Plack Ach, Domp Muddy Plack Fill	5
4.0	5	20	63	50	9	40	Black Ash, Damp Muddy Black Fill	5
4.5	5	20	83	50	9	40	Black Ash, Damp Muddy Black Fill	5
5.0	5	20	83	50	9	40	Black Ash, Damp Muddy Black Fill	5
5.5	5	20	83	50	9	40	Black Ash, Damp Muddy Black Fill	5
6.0	7	20	83	50	9	40	Black Ash, Damp Muddy Black Fill	7
6.5	7	20	83	50	9	40	Black Ash, Damp Muddy Black Fill	7
7.0	7	20	83	50	9	40	Black Ash, Damp Muddy Black Fill	7
7.5	35	100	83	50	9	40	Firm Sand Gravel	35
8.0	70	100	83	50	ů	40	Firm Sand, Gravel	70
0.0	57	100	00	50	0	40	Firm Sand, Gravel	57
6.5	57	100	63	50	9	40	Film Sand, Glavel	57
9.0	87	100	83	50	9	40	Firm Sand, Gravel	87
9.5	33	100	83	50	9	40	Firm Sand, Gravel	33
10.0	32	100	83	50	9	40	Firm Sand, Gravel	32
10.5	34	100	83	50	9	40	Firm Sand, Gravel	34
11.0	64	100	83	50	9	40	Firm Sand, Gravel	64
11.5	82	100	83	50	9	40	Firm Sand, Gravel	82
12.0	40	100	83	50	9	40	Firm Sand. Gravel	40
12.5	39	100	83	50	9	40	Firm Sand, Gravel	39
13.0	40	100	83	50	9	40	Firm Sandy Clay	40
12.5	20	100	82	50	0	40	Firm Sandy Clay	29
14.0	20	100	00	50	9	40	Firm Sondy Clay	20
14.0	20	100	83	50	9	40	Firm Sandy Clay	20
14.5	24	100	83	50	y	40	Firm Sandy Clay	24
15.0	26	100	83	50	9	40	Firm Sandy Clay	26
15.5	31	100	83	50	9	40	Firm Sandy Clay	31
16.0	29	100	83	50	9	40	Sandy Clay, Small Chalk Traces	29
16.5	88	100	83	50	9	40	Sandy Clay, Small Chalk Traces	88
17.0	77	100	83	50	9	40	Sandy Clay, Small Chalk Traces	77
17.5	49	100	83	50	9	40	Sandy Clay, Small Chalk Traces	49
18.0	109	100	83	50	ů.	40	Hard Elint Chalk	109
19.5	425	100	00	50	0	40	Hard Flint, Chalk	425
10.0	42.5	100	00	50	0	40	Firm Chalk, Small Flint Ports	40
19.0	40	100	63	50	9	40	Film Chalk, Small Flint Faits	40
19.5	30	100	83	50	9	40	Firm Chaik, Small Flint Parts	30
20.0	33	100	83	50	9	40	Firm Chalk, Small Flint Parts	33
20.5	32	100	83	50	9	40	Firm Chalk, Small Flint Parts	32
21.0	20	100	83	50	9	40	Firm Chalk, Small Flint Parts	20
21.5	24	100	83	50	9	40	Firm Chalk, Small Flint Parts	24
22.0	20	100	83	50	9	40	Firm Chalk, Small Flint Parts	20
22.5	24	100	83	50	9	40	Firm Chalk, Small Flint Parts	24
23.0	37	100	83	50	9	40	Firm Chalk, Small Flint Parts	37
23.5	27	100	83	50	q	40	Firm Chalk Small Flint Parts	27
24.0	33	100	83	50	9	40	Firm Chalk, Small Flint Parts	33
24.0	55	100	00	50	3	40	Firm Chalk, Small Flint Parts	65
24.5	65	100	63	50	9	40	Film Chaik, Small Film Parts	00
25.0	25	100	83	50	g	40	Firm Chalk, Small Flint Parts	25
25.5	24	100	83	50	9	40	Firm Chaik, Small Flint Parts	24
26.0	25	100	83	50	9	40	Firm Chalk, Small Flint Parts	25
26.5	23	100	83	50	9	40	Firm Chalk, Small Flint Parts	23
27.0	20	100	83	50	9	40	Firm Chalk, Small Flint Parts	20
27.5	29	100	83	50	9	40	Firm Chalk, Small Flint Parts	29
28.0	25	100	83	50	9	40	Firm Chalk, Small Flint Parts	25
28.5	25	100	83	50	9	40	Firm Chalk, Small Flint Parts	25
29.0	27	100	83	50	9	40	Firm Chalk, Small Flint Parts	27
29.5	24	100	83	50	9	40	Firm Chalk, Small Flint Parts	24
30.0	21	100	83	50	0	40	Firm Chalk, Small Flint Parts	21
30.0 20 F	20	100	00	50	3	40	Firm Chalk, Small Flint Parts	21
30.5	20	100	00	50	9	40	Finn Chaik, Smail Fint Parts	20
31.0	25 00	100	83	50	a	40	Firm Chaik, Small Flint Parts	25
31.5	28	100	83	50	9	40	Firm Chaik, Small Flint Parts	28
32.0	23	100	83	50	9	40	Firm Chalk, Small Flint Parts	23
32.5	22	100	83	50	9	40	Firm Chalk, Small Flint Parts	22
33.0	21	100	83	50	9	40	Firm Chalk, Small Flint Parts	21
33.5	22	100	83	50	9	40	Firm Chalk, Small Flint Parts	22
34.0	26	100	83	50	9	40	Firm Chalk, Small Flint Parts	26
34.5	30	100	83	50	9	40	Firm Chalk, Small Flint Parts	30
35.0	35	100	83	50	9	40	Firm Chalk, Small Flint Parts	35
35.5	34	100	83	50	a	40	Firm Chalk, Small Flint Parts	34
36.0	38	100	83	50	9	40	Firm Chalk, Small Flint Parts	38
36.5	35	100	82	50	9	40	Firm Chalk, Small Flint Parts	25
30.5	35	100	03	50	а	40	Firm Chaik, Small Flint Parts	
37.0	40	100	83	50	9	40	Firm Chaik, Small Flint Parts	40
37.5	28	100	83	50	9	40	Firm Chalk, Small Flint Parts	28
38.0	32	100	83	50	9	40	Firm Chalk, Small Flint Parts	32
38.5	37	100	83	50	9	40	Firm Chalk, Small Flint Parts	37
39.0	34	100	83	50	9	40	Firm Chalk, Small Flint Parts	34
39.5	37	100	83	50	9	40	Firm Chalk, Small Flint Parts	37

Fontmell Close, St Albans			Driller	Forkers
			Rig Type	C6
Site Record of Rotary Borehole	Investigation	S	Casing dia (mm)	150
			Drill Bit Size (mm)	110
Borehole Number: BH210	Date: 13	3/01/16	Vert/Inc (°)	17

Meterage (m)	Pene Rate (s)	% Returns	Rotary Speed (RPM)	Applied Load (BAR)	Air Pressure (BAR)	Casing (m)	Geology	Provisional Analysis
0.0	166	100	83	50	9	47.5	Concrete	166
0.5	201	100	83	50	9	47.5	Concrete	
1.0	106	100	83	50	9	47.5	Concrete	
2.0	140	100	83	50	9	47.5	Concrete	
2.5	110	100	83	50	9	47.5	Concrete	110
3.0	151	20	83	50	9	47.5	Concrete Black Ash, Fill, Veny Soft	151 37
4.0	5	202	83	50	9	47.5	Black Ash, Fill, Very Soft	5
4.5	6	20	83	50	9	47.5	Black Ash, Fill, Very Soft	6
5.0	5	20	83	50	9	47.5	Black Ash, Fill, Very Soft	5
5.5	5	20	83	50	9	47.5	Black Ash, Fill, Very Soft	5
6.5	45	20	83	50	9	47.5	Black Ash, Fill, Very Soft	45
7.0	52	20	83	50	9	47.5	Black Ash, Fill, Very Soft	52
7.5	46	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	46
8.0	54	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	54
8.5 9.0	50	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	50
9.5	32	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	32
10.0	36	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	36
10.5	43	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	43
11.0	46	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	46
12.0	46	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	46
12.5	31	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	31
13.0	38	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	38
13.5	67	100	03 83	50 50	9	47.5	Stiff Sandy Clavey Gravel	67
14.5	45	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	45
15.0	30	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	30
15.5	41	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	41
16.5	73	100	03 83	50 50	9	47.5	Stiff Sandy Clayey Gravel	
17.0	59	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	59
17.5	47	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	47
18.0	70	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	70
18.5	80 81	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	80 81
19.5	82	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	82
20.0	58	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	58
20.5	73	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	73
21.0	34	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	34
22.0	71	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	71
22.5	80	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	80
23.0	57	100	83	50	9	47.5	Stiff Sandy Clayey Gravel	57
23.5	64 82	100	83	50	9	47.5	Very Stiff Sandy Clayey Gravel	64 82
24.5	91	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	91
25.0	124	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	124
25.5	114	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	114
26.0	94	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	94 104
27.0	82	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	82
27.5	112	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	112
28.0	125	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	125
28.5	95	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	95
29.5	130	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	130
30.0	210	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	210
30.5	250	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	250
31.0	220	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	195 220
32.0	195	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	195
32.5	211	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	211
33.0	157	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	157
34.0	194	100	03 83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	194
34.5	166	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	166
35.0	86	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	86
35.5	74	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	74
36.5	84	100	03 83	50 50	9	47.5	Very Stiff Sandy Clay,Some Gravel	84
37.0	87	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	87
37.5	60	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	60
38.0	62	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	62
39.0	54	100	00 83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	-54
39.5	51	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	51
40.0	80	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	80
40.5	88	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	88
41.0	84 57	100	83	50 50	9	47.5	Very Stiff Sandy Clay, Some Gravel	<b>64</b> 57
42.0	70	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	70
42.5	60	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	60
43.0	77	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	77
43.5	93	100	83	50 50	9	47.5	Very Stiff Sandy Clay, Some Gravel	93 68
44.5	108	100	83	50	9	47.5	Very Stiff Sandy Clay,Some Gravel	108
45.0	95	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	95
45.5	214	100	83	50	9	47.5	Very Stiff Sandy Clay, Some Gravel	214
46.0	176	100	83 83	50	9	47.5 47.5	Cream Sandy Clay/ Chalk	176
47.0	187	100	83	50	9	47.5	Cream Sandy Clay/ Chalk	187

Casing rotation pressue increased from 50 bar to 100 bar from 24m, increased to 120 bar at 31m,

From 43m, soft drilling on rods, littlte resistance, casing tight

Borehole Number: BH211

Site Record of Rotary Borehole Investigations

100

83

50 50

40 40

Firm C Firm C

	Driller	Forkers
	Rig Type	C6
vestigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 14/01/16	Vert/Inc (°)	17

Meterage (m)	Pene Rate (s)	% Returns	Rotary Speed (RPM)	Applied Load (BAR)	Air Pressure (BAR)	Casing (m)	Geology	Provisional Analysis
0.0	343	100	83	50	9	40	Concrete	343
0.5	266	100	83	50	9	40	Concrete	266
1.0	130	100	83	50	9	40	Concrete	130
1.5	110	100	83	50	9	40	Concrete	110
2.0	114	100	83	50	9	40	Concrete	114
2.5	116	100	83	50	y o	40	Concrete	116
3.0	160	100	83	50	9	40	Concrete Dark brown good group	160
3.5	4	100	03 83	50	9	40	Dark brown sand gravel	4
4.5	4	100	83	50	9	40	Dark brown sand gravel	4
5.0	3	100	83	50	9	40	Dark brown sand gravel	3
5.5	4	100	83	50	9	40	Dark brown sand gravel	4
6.0	91	100	83	50	9	40	Dark brown sand gravel	91
6.5	4	100	83	50	9	40	Dark brown sand gravel	4
7.0	42	100	83	50	9	40	Light Dark Brown stiff sand clay	42
7.5	16	100	83	50	9	40	Light Dark Brown stiff sand clay	16
8.0	12	100	83	50	9	40	Light Dark Brown stiff sand clay	12
8.5	15	100	83	50	y o	40	Light Dark Brown stiff sand clay	15
9.0	11	100	03 83	50	9	40	Light Dark Brown stiff sand clay	11
9.5	12	100	83	50	9	40	Light Dark Brown stiff sand clay	12
10.5	29	100	83	50	9	40	Light Dark Brown stiff sand clay	29
11.0	17	100	83	50	9	40	Light Dark Brown stiff sand clay	17
11.5	16	100	83	50	9	40	Light Dark Brown stiff sand clay	16
12.0	18	100	83	50	9	40	Light Dark Brown stiff sand clay	18
12.5	53	100	83	50	9	40	Light Dark Brown stiff sand clay	53
13.0	40	100	83	50	9	40	Light Dark Brown stiff sand clay	40
13.5	18	100	83	50	9	40	Light Dark Brown stiff sand clay	18
14.0	29	100	83	50	9	40	Light Dark Brown stiff sand clay	29
14.5	34	100	83	50	9	40	Light Dark Brown stiff sand clay	34
15.0	27	100	83	50	9	40	Light Dark Brown stiff sand clay	27
16.0	215	100	83	50	9	40	Light Dark Brown stiff sand clay	215
16.5	72	100	83	50	9	40	Light Dark Brown stiff sand clay	72
17.0	57	100	83	50	9	40	Light Dark Brown stiff sand clay	57
17.5	19	100	83	50	9	40	Creamy colour chalk sand	19
18.0	21	100	83	50	9	40	Creamy colour chalk sand	21
18.5	31	100	83	50	9	40	Creamy colour chalk sand	31
19.0	10	100	83	50	9	40	Pale White Chalk, small flint parts	10
19.5	12	100	83	50	9	40	Pale White Chalk, small flint parts	12
20.0	14	100	83	50	9	40	Pale White Chalk, small flint parts	14
20.5	15	100	03	50	9	40	Pale White Chark, small flint parts	10
21.0	10	100	83	50	9	40	Pale White Chalk, small flint parts	10
22.0	10	100	83	50	9	40	Pale White Chalk, small flint parts	10
22.5	19	100	83	50	9	40	Pale White Chalk, small flint parts	19
23.0	10	100	83	50	9	40	Pale White Chalk, small flint parts	10
23.5	18	100	83	50	9	40	Pale White Chalk, small flint parts	18
24.0	17	100	83	50	9	40	Pale White Chalk, small flint parts	17
24.5	16	100	83	50	9	40	Pale White Chalk, small flint parts	16
25.0	19	100	83	50	9	40	Pale White Chalk, small flint parts	19
25.5	13	100	83	50	9	40	Pale White Chalk, small flint parts	13
20.U	∠6 10	100	83	50	9	40	Pale White Chalk, small flint parts	26
20.5	26	100	83	50	9	40	Pale White Chalk, small flint parts	26
27.5	18	100	83	50	9	40	Pale White Chalk, small flint parts	18
28.0	40	100	83	50	9	40	Pale White Chalk, small flint parts	40
28.5	39	100	83	50	9	40	Pale White Chalk, small flint parts	39
29.0	26	100	83	50	9	40	Pale White Chalk, small flint parts	26
29.5	19	100	83	50	9	40	Pale White Chalk, small flint parts	19
30.0	24	100	83	50	9	40	Pale White Chalk, small flint parts	24
30.5	25	100	83	50	9	40	Pale White Chalk, small flint parts	25
31.0	40	100	83	50	9	40	Pale White Chalk, small flint parts	40
31.5	22	100	83	50	9	40	Pale White Chalk, small flint parts	22
32.0	19	100	83	50	9	40	Pale White Chalk, small flint parts	19
32.5 33.0	43	100	00 83	50	9	40	Pale White Chalk, small flint parts	43
33.5	27	100	83	50	9	40	Pale White Chalk small flint parts	27
34.0	28	100	83	50	9	40	Pale White Chalk, small flint parts	28
34.5	26	100	83	50	9	40	Pale White Chalk, small flint parts	26
35.0	24	100	83	50	9	40	Pale White Chalk, small flint parts	24
35.5	22	100	83	50	9	40	Pale White Chalk, small flint parts	22
36.0	26	100	83	50	9	40	Pale White Chalk, small flint parts	26
36.5	23	100	83	50	9	40	Pale White Chalk, small flint parts	23
37.0	22	100	83	50	9	40	Pale White Chalk, small flint parts	22
31.5	28 50	100	83	50	9	40	Pale white Unark, small flint parts	28
20.0	40	100	03	50	3	40	Finit Halu Firm Chalk	40

Borehole Number: BH212

Site Record of Rotary Borehole Investigations

Date:

15/01/16

Driller	Forkers
Rig Type	C6
Casing dia (mm)	150
Drill Bit Size (mm)	110
Vert/Inc (°)	10

Meterag Rotary Spe (RPM) Applied Lo (BAR) Provisional Analysis Pene Air Press % Returns Geology Rate (s) 375 (BAR) (m) (m) 0.0 Concrete 0.5 Concret 237 124 90 1.0 Concrete 1.5 2.0 2.5 100 100 83 83 40 40 50 50 Concrete Concrete Concrete 3.0 3.5 4.0 83 83 50 50 40 40 20 20 Very Soft Black Ash Fill Very Soft Black Ash Fil g Very Soft Black Ash Fill 4.5 5.0 25 83 50 40 Very Soft Black Ash Fill Very Soft Black Ash Fill 20 5.5 Very Soft Black Ash Fill 40 6.0 6.5 Very Soft Black Ash Fill Light Dark Brown Sand Grave 12 83 50 100 Light Dark Brown Sand Gravel Light Dark Brown Sand Gravel 7.0 7.5 100 83 50 8.0 Light Dark Brown Sand Grave 8.5 9.0 100 40 Light Dark Brown Sand Grave Light Dark Brown Sand Grave 37 83 50 Light Dark Brown Sand Gravel Light Dark Brown Sand Gravel Light Dark Brown Sand Gravel 9.5 10.0 67 100 83 50 40 10.5 11.0 Light Dark Brown Sand Gravel 11.5 12.0 12.5 40 40 Light Dark Brown Sand Gravel Pale White Chalk, small flint parts Pale White Chalk, small flint parts 83 83 100 50 17 13.0 13.5 14.0 Pale White Chalk, small flint parts 40 100 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 14.5 15.0 100 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 14 83 50 15.5 Pale White Chalk, small flint parts 16.0 16.5 40 Pale White Chalk, small flint parts 14 Pale White Chalk, small flint parts 17.0 100 83 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 17 5 18.0 Pale White Chalk, small flint parts 18.5 19.0 19.5 40 40 100 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 14 83 50 Pale White Chalk, small flint parts g 20.0 20.5 100 40 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 17 50 83 g 21.0 Pale White Chalk, small flint parts 21.5 22.0 30 100 83 40 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 50 22.5 23.0 Pale White Chalk, small flint parts Pale White Chalk, small flint part 40 23.5 24.0 100 83 Pale White Chalk, small flint parts g Pale White Chalk, small flint parts 40 40 24.5 Pale White Chalk, small flint parts 25.0 25.5 83 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 100 40 26.0 Pale White Chalk, small flint parts 26.5 Pale White Chalk, small flint parts 27.0 27.5 28.0 19 21 100 100 83 83 50 50 Pale White Chalk, small flint parts 28.5 29.0 29.5 100 100 83 83 50 50 40 40 Pale White Chalk, small flint parts Pale White Chalk, small flint parts Pale White Chalk, small flint parts C 30.0 30.5 100 40 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 21 83 50 31.0 Pale White Chalk, small flint parts 31.5 32.0 100 40 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 32.5 33.0 33.5 100 19 83 Pale White Chalk, small flint parts Pale White Chalk, small flint parts Pale White Chalk, small flint parts 34.0 Pale White Chalk, small flint parts Pale White Chalk, small flint parts 34.5 Pale White Chalk, small flint parts 35.0 100 83 40 35.5 36.0 Pale White Chalk, small flint parts 26 35 83 83 Pale White Chalk, small flint parts 50 50 37.0 37.5 38.0 100 100 Pale White Chalk, small flint parts 38.5 40 39.0 39.5 83 50

Borehole Number: BH213

Site Record of Rotary Borehole Investigations

	Driller	Forkers
	Rig Type	C6
Investigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 05/01/16	Vert/Inc (°)	7

Weak Chalk, Small Flint Bands Weak Chalk, Small Flint Bands

(m)	Rate (s)	% Returns	(RPM)	(BAR)	(BAR)	(m)	Geology	Analysis
0.0	210	100	83	50	9	50	Concrete	210
0.5	73	100	83	50	9	50	Concrete	73
1.0	87	100	83	50	9	50	Concrete	87
1.5	45	100	83	50	9	50	Concrete	45
2.5	200	100	83	50	9	50	Concrete	200
3.0	76	100	83	50	9	50	Concrete	76
3.5	67	100	83	50	9	50	Concrete	67
4.0	87	100	83	50	9	50	Concrete	87 10
4.5	10	100	83	50	9	50	Concrete	15
5.5	6	10	83	50	9	50	Ash Fill	6
6.0	5	10	83	50	9	50	Ash Fill	5
6.5	6	10	83	50	9	50	Ash Fill	6
7.0	5	10	83	50	9	50	Ash Fill	5
8.0	5	10	83	50	9	50	Ash Fill	5
8.5	5	10	83	50	9	50	Ash Fill	5
9.0	6	10	83	50	9	50	Ash Fill	6
9.5	5	10	83	50	9	50	Ash Fill	5
10.0	5	50	83	50	9	50	Light Grey Sandy Clay	5
11.0	40	50	83	50	9	50	Light Grey Sandy Clay	40
11.5	5	50	83	50	9	50	Light Grey Sandy Clay	5
12.0	5	50	83	50	9	50	Light Grey Sandy Clay	5
12.5	5	50	83	50	9	50	Light Grey Sandy Clay	5
13.0	5 7	50	83 83	50 50	9	50	Light Grey Sandy Clay	5
14.0	8	50	83	50	9	50	Light Grey Sandy Clay	8
14.5	8	50	83	50	9	50	Light Grey Sandy Clay	8
15.0	8	50	83	50	9	50	Pale Grey Clay	8
15.5	7	50	83	50	9	50	Pale Grey Clay	7
16.5	7	50	03 83	50 50	9	50	Pale Grey Clay	7
17.0	8	50	83	50	9	50	Pale Grey Clay	8
17.5	8	50	83	50	9	50	Pale Grey Clay	8
18.0	9	50	83	50	9	50	Pale Grey Clay	9
18.5	9	50	83	50	9	50	Chalky, Gravel, Clay	9
19.0	9 10	50	83	50	9	50	Chalky, Gravel, Clay	10
20.0	15	50	83	50	9	50	Chalky, Gravel, Clay	15
20.5	20	50	83	50	9	50	Chalky, Gravel, Clay	20
21.0	10	50	83	50	9	50	Chalky, Gravel, Clay	10
21.5	25	50	83	50	9	50	Week Chalk, Small Flint Bands	10
22.5	20	50	83	50	9	50	Weak Chalk, Small Flint Bands	20
23.0	27	50	83	50	9	50	Weak Chalk, Small Flint Bands	27
23.5	30	50	83	50	9	50	Weak Chalk, Small Flint Bands	30
24.0	32	50	83	50	9	50	Weak Chalk, Small Flint Bands	32
24.5	35	50	83	50	9	50	Weak Chalk, Small Flint Bands	35
25.5	21	50	83	50	9	50	Weak Chalk, Small Flint Bands	21
26.0	35	50	83	50	9	50	Weak Chalk, Small Flint Bands	35
26.5	30	50	83	50	9	50	Weak Chalk, Small Flint Bands	30
27.0	14	50	83	50	9	50	Weak Chalk, Small Flint Bands	14
28.0	31	50	83	50	9	50	Weak Chalk, Small Flint Bands	31
28.5	20	50	83	50	9	50	Weak Chalk, Small Flint Bands	20
29.0	18	50	83	50	9	50	Weak Chalk, Small Flint Bands	18
29.5	14	50	83	50	9	50	Weak Chalk, Small Flint Bands	14
30.5	5	50	83	50	9	50	Weak Chalk, Small Flint Bands	5
31.0	5	50	83	50	9	50	Weak Chalk, Small Flint Bands	5
31.5	5	50	83	50	9	50	Weak Chalk, Small Flint Bands	5
32.0	8	50	83	50	9	50	Weak Chalk, Small Flint Bands	8
33.0	8	50	83	50	9	50	Weak Chalk, Small Flint Bands	8
33.5	9	50	83	50	9	50	Weak Chalk, Small Flint Bands	9
34.0	25	50	83	50	9	50	Weak Chalk, Small Flint Bands	25
34.5	25	50	83	50	9	50	Weak Chalk, Small Flint Bands	25
35.5	22	50	83	50	9	50	Weak Chalk, Small Flint Bands	22
36.0	22	50	83	50	9	50	Weak Chalk, Small Flint Bands	22
36.5	27	50	83	50	9	50	Weak Chalk, Small Flint Bands	27
37.0	25	50	83	50	9	50	Weak Chalk, Small Flint Bands	25
37.5	20	50	83	50	9	50	Weak Chalk, Small Flint Bands	10
38.5	10	50	83	50	9	50	Weak Chalk, Small Flint Bands	10
39.0	10	50	83	50	9	50	Weak Chalk, Small Flint Bands	10
39.5	10	50	83	50	9	50	Weak Chalk, Small Flint Bands	10
40.0	30	50 50	83	50 50	9 Q	50 50	Weak Chalk, Small Flint Bands	10
41.0	10	50	83	50	9	50	Weak Chalk, Small Flint Bands	10
41.5	7	50	83	50	9	50	Weak Chalk, Small Flint Bands	7
42.0	15	50	83	50	9	50	Weak Chalk, Small Flint Bands	15
42.5	14	50 50	83	50 50	9	50 50	Weak Chalk, Small Flint Bands	14
43.5	17	50	83	50	9	50	Weak Chalk, Small Flint Bands	17
44.0	18	50	83	50	9	50	Weak Chalk, Small Flint Bands	18
44.5	14	50	83	50	9	50	Weak Chalk, Small Flint Bands	14
45.0	12	50	83	50	9	50	Weak Chalk, Small Flint Bands	12
45.5	13	50	83	50	9	50	Weak Chalk, Small Flint Bands	13
46.5	13	50	83	50	9	50	Weak Chalk, Small Flint Bands	13
47.0	14	50	83	50	9	50	Weak Chalk, Small Flint Bands	14
47.5	19	50	83	50	9	50	Weak Chalk, Small Flint Bands	19
40.U	24	50	03	50	9	50	Weak Chalk, Small Flint Bands	22

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50 50 83 83

ontmell Close, St Albans		Driller	Forkers
		Rig Type	C6
ite Record of Rotary Borehole	Investigations	Casing dia (mm)	150
		Drill Bit Size (mm)	110
Borehole Number: BH214	Date: 06/01/1	Vert/Inc (°)	7

Meterage (m)	Pene Rate (s)	% Returns	Rotary Speed (RPM)	Applied Load (BAR)	Air Pressure (BAR)	Casing (m)	Geology	Provisional Analysis
0.0	320	100	83	50 50	9	100	Concrete	320
1.0	100	100	83	50	9	100	Concrete	100
1.5	69	100	83	50	9	100	Concrete	69
2.0	122	100	83	50 50	9	100	Concrete	122
3.0	91	100	83	50	9	100	Concrete	91
3.5	54	100	83	50	9	100	Concrete	54
4.0	69 31	100	83	50	9	100	Concrete	31
5.0	10	100	83	50	9	10	Black ash	10
5.5	10	10	83	50	9	10	Black ash	10
6.0	10	10	83	50 50	9	10	Soft muddy black fill Soft muddy black fill	10
7.0	6	10	83	50	9	10	Soft muddy black fill	6
7.5	7	10	83	50	9	10	Soft muddy black fill	7
8.5	7	10	83	50	9	10	Soft muddy black fill	7
9.0	6	10	83	50	9	10	Soft muddy black fill	6
9.5	6	10	83	50 50	9	10	Soft muddy black fill	6
10.5	6	50	83	50	9	10	Soft muddy black fill	6
11.0	11	50	83	50	9	10	Soft muddy black fill	11
11.5	12	50 50	83	50 50	9	10	Soft muddy black fill	12
12.5	12	50	83	50	9	10	Soft muddy black fill	12
13.0	15	50	83	50	9	10	Soft muddy black fill	15
13.5 14.0	15 30	50 50	83 83	50 50	9	10 10	Soft muddy black fill Light Brown Sandy Clay	15 30
14.5	50	50	83	50	9	10	Light Brown Sandy Clay	50
15.0	70	50	83	50	9	10	Light Brown Sandy Clay	70
15.5 16.0	30 17	50 50	83 83	50 50	9	10	Light Brown Sandy Clay	30
16.5	15	50	83	50	9	10	Light Brown Sandy Clay	15
17.0	17	50	83	50	9	10	Light Grey Sandy Clay	17
17.5	15	50	83	50	9	10	Light Grey Sandy Clay	15
18.5	8	50	83	50	9	10	Light Grey Sandy Clay	8
19.0	19	50	83	50	9	10	Light Grey Sandy Clay	19
20.0	26	50	83	50	9	10	Light Grey Sandy Clay	26
20.5	17	50	83	50	9	10	Light Grey Sandy Clay	17
21.0	29	50 50	83 83	50 50	9	10 50	Light Grey Sandy Clay White Chalk, Small Flint Bands	29
22.0	50	50	83	50	9	50	White Chalk, Small Flint Bands	50
22.5	55	50	83	50	9	50	White Chalk, Small Flint Bands	55
23.0	39	50 50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk, Small Flint Bands	39 13
24.0	20	50	83	50	9	50	White Chalk, Small Flint Bands	20
24.5	27	50	83	50	9	50	White Chalk, Small Flint Bands	27
25.0	26	50 50	83	50	9	50 50	White Chaik, Small Flint Bands White Chalk, Small Flint Bands	26
26.0	30	50	83	50	9	50	White Chalk, Small Flint Bands	30
26.5	20	50	83	50	9	50	White Chalk, Small Flint Bands	20
27.5	23	50	83	50	9	50	White Chalk, Small Flint Bands	23
28.0	35	50	83	50	9	50	White Chalk, Small Flint Bands	35
28.5	31 19	50 50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk, Small Flint Bands	31
29.5	17	50	83	50	9	50	White Chalk, Small Flint Bands	17
30.0	23	50	83	50	9	50	White Chalk, Small Flint Bands	23
30.5	20 40	50 50	83	50	9	50	White Chaik, Small Flint Bands White Chalk, Small Flint Bands	40
31.5	12	50	83	50	9	50	White Chalk, Small Flint Bands	12
32.0	18	50	83	50	9	50	White Chalk, Small Flint Bands	18
32.5	15	50	83	50	9	50	White Chalk, Small Flint Bands	15
33.5	10	50	83	50	9	50	White Chalk, Small Flint Bands	10
34.0 34.5	17	50 50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk, Small Flint Bands	17
35.0	12	50	83	50	9	50	White Chalk, Small Flint Bands	12
35.5	10	50	83	50	9	50	White Chalk, Small Flint Bands	10
36.0 36.5	18	50 50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk. Small Flint Bands	18
37.0	20	50	83	50	9	50	White Chalk, Small Flint Bands	20
37.5	10	50	83	50	9	50	White Chalk, Small Flint Bands	10
38.5	20	50	83	50	9	50	White Chalk, Small Filnt Bands	20
39.0	15	50	83	50	9	50	White Chalk, Small Flint Bands	15
39.5	15	50	83	50	9	50	White Chalk, Small Flint Bands	15
40.0	19	50	83	50	9	50	White Chalk, Small Flint Bands	19
41.0	17	50	83	50	9	50	White Chalk, Small Flint Bands	17
41.5 42.0	20 22	50 50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk Small Flint Bands	20
42.5	18	50	83	50	9	50	White Chalk, Small Flint Bands	18
43.0	16	50	83	50	9	50	White Chalk, Small Flint Bands	16
43.5 44.0	20	50 50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk, Small Flint Bands	20
44.5	22	50	83	50	9	50	White Chalk, Small Flint Bands	22
45.0	21	50	83	50	9	50	White Chalk, Small Flint Bands	21
45.5 46.0	22	50	83 83	50 50	9	50 50	White Chalk, Small Flint Bands White Chalk. Small Flint Bands	22
46.5	15	50	83	50	9	50	White Chalk, Small Flint Bands	15
47.0	14	50	83	50	9	50	White Chalk, Small Flint Bands	14
48.0	680	50	83	50	9	50	White Chalk / Hard Flint	680
48.5	17	50	83	50	9	50	White Chalk	17
49.0 49.5	18 21	50 50	83 83	50 50	9	50 50	White Chalk White Chalk	18

Borehole Number: BH215

Site Record of Rotary Borehole Investigations

100 100

	Driller	Forkers
	Rig Type	C6
Investigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 22/01/16	Vert/Inc (°)	V

Whie Cl

alk Flint Pa

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
0.0	PIT	0	(KPIVI) 83	(BAR) 50	(BAR) 9	(11)	Trial Pit	Analysis
0.5	21	100	83	50	9	40	Sand Gravel	21
1.0	20	100	83	50	9	40	Sand Gravel	20
1.5	21	100	83	50	9	40	Sand Gravel	21
2.0	19	100	83	50	9	40	Sand Gravel	19
2.5	17	100	83	50	9	40	Sand Gravel	17
3.0	17	100	83	50	9	40	Sand Gravel	17
4.0	10	50	83	50	9	40	Black Ash Stoney Fill	10
4.5	10	50	83	50	9	40	Black Ash Stoney Fill	10
5.0	18	50	83	50	9	40	Black Ash Stoney Fill	18
5.5	41	50	83	50	9	40	Black Ash Stoney Fill	41
6.0	68	100	83	50	9	40	Sand Gravel	
6.5	100	100	83	50	9	40	Sand Gravel	
7.0	6/	100	83	50	y o	40	Sand Gravel	
7.5	63	100	83	50	9	40	Sand Gravel	
8.5	33	100	83	50	9	40	Sand Gravel	33
9.0	37	100	83	50	9	40	Sand Gravel	37
9.5	27	100	83	50	9	40	Sand Gravel	27
10.0	27	100	83	50	9	40	Sand Gravel	27
10.5	35	100	83	50	9	40	Sand Gravel	35
11.0	45	100	83	50	9	40	Sand Gravel	45
11.5	20	100	83	50	9	40	Stiff Sandy Clay	20
12.0	∠1 23	100	03 83	50	9	40	Stiff Sandy Clay	21
13.0	23	100	83	50	9	40	Stiff Sandy Clay	23
13.5	21	100	83	50	9	40	Stiff Sandy Clay	21
14.0	19	100	83	50	9	40	Stiff Sandy Clay	19
14.5	17	100	83	50	9	40	Stiff Sandy Clay	17
15.0	20	100	83	50	9	40	Stiff Sandy Clay	20
15.5	7	100	83	50	9	40	Very Soft Drilling, Small Sand Trace	7
16.0	7	100	83	50	9	40	Very Soft Drilling, Small Sand Trace	7
10.5	6	100	83	50	9	40	Sand Gravel	0
17.5	9 11	100	83	50	9	40	Sand Gravel	9 11
18.0	14	100	83	50	9	40	Sand Gravel	14
18.5	12	100	83	50	9	40	Light Brown Cream Sandy Chalk	12
19.0	11	100	83	50	9	40	Light Brown Cream Sandy Chalk	11
19.5	16	100	83	50	9	40	Light Brown Cream Sandy Chalk	16
20.0	21	100	83	50	9	40	Light Brown Cream Sandy Chalk	21
20.5	32	100	83	50	9	40	Light Brown Cream Sandy Chalk	32
21.0	31	100	83	50	9	40	Light Brown Cream Sandy Chalk	31
22.0	34	100	83	50	9	40	Light Brown Cream Sandy Chalk	34
22.5	33	100	83	50	9	40	Light Brown Cream Sandy Chalk	33
23.0	20	100	83	50	9	40	Light Brown Cream Sandy Chalk	20
23.5	18	100	83	50	9	40	Light Brown Cream Sandy Chalk	18
24.0	19	100	83	50	9	40	Light Brown Cream Sandy Chalk	19
24.5	18	100	83	50	9	40	Light Brown Cream Sandy Chalk	18
25.0	22	100	83	50	y o	40	Light Brown Cream Sandy Chalk	22
25.5	19	100	03 83	50	9	40	Light Brown Cream Sandy Chalk	19
26.5	22	100	83	50	9	40	Whie Chalk Flint Parts	22
27.0	21	100	83	50	9	40	Whie Chalk Flint Parts	21
27.5	19	100	83	50	9	40	Whie Chalk Flint Parts	19
28.0	43	100	83	50	9	40	Whie Chalk Flint Parts	43
28.5	39	100	83	50	9	40	Whie Chalk Flint Parts	39
29.0	44	100	83	50	9	40	Whie Chalk Flint Parts	44
29.5	23	100	83	50	9	40	Whie Chalk Flint Parts	23
30.5	22	100	83	50	9	40	Whie Chalk Flint Parts	22
31.0	17	100	83	50	9	40	Whie Chalk Flint Parts	17
31.5	16	100	83	50	9	40	Whie Chalk Flint Parts	16
32.0	20	100	83	50	9	40	Whie Chalk Flint Parts	20
32.5	28	100	83	50	9	40	Whie Chalk Flint Parts	28
33.0	34	100	83	50	9	40	Whie Chalk Flint Parts	34
33.5	23	100	83	50	9	40	Whie Chalk Flint Parts	23
34.U 34.5	∠4 22	100	03 83	50 50	9	40	Whie Chalk Flint Parts	24
35.0	22	100	83	50	9	40	Whie Chalk Flint Parts	22
35.5	23	100	83	50	9	40	Whie Chalk Flint Parts	23
36.0	21	100	83	50	9	40	Whie Chalk Flint Parts	21
36.5	27	100	83	50	9	40	Whie Chalk Flint Parts	27
37.0	20	100	83	50	9	40	Whie Chalk Flint Parts	20
37.5	21	100	83	50	9	40	Whie Chalk Flint Parts	21
38.0	23	100	83	50	9	40	Whie Chalk Flint Parts	23

Fontmell Close, St Albans			Driller	Forkers
			Rig Type	C6
Site Record of Rotary Borehole I	Investigations	s	Casing dia (mm)	150
			Drill Bit Size (mm)	110
Borehole Number: BH216	Date: 26	6/01/16	Vert/Inc (°)	V

Meterage (m)	Pene Rate (s)	% Returns	Rotary Speed (RPM)	Applied Load (BAR)	Air Pressure (BAR)	Casing (m)	Geology	Provisional Analysis
0.0	PIT	0	83	50	9	50	Trial Pit	PIT
1.0	7	10	83	50	9	50	Black Ash Stone	7
1.5	6	10	83	50	9	50	Black Ash Stone	6
2.0	6	10 10	83 83	50 50	9	50 50	Black Ash Stone Black Ash Stone	6
3.0	16	100	83	50	9	50	Dark Brown Sand Gravel	16
3.5	41	100	83 83	50 50	9	50 50	Dark Brown Sand Gravel	41
4.5	13	100	83	50	9	50	Dark Brown Sand Gravel	13
5.0	1	100	83	50	9	50	Dark Brown Sand Gravel	1
5.5	16	100	83	50	9	50	Dark Brown Sand Gravel	16
6.5	24	100	83	50	9	50	Dark Brown Sand Gravel	24
7.0	29 26	100	83 83	50 50	9	50 50	Dark Grey Brown Gravel Dark Grey Brown Gravel	29 26
8.0	50	100	83	50	9	50	Red Brown Sand Gravel Clay	50
8.5	64	100	83	50	9	50	Red Brown Sand Gravel Clay	64
9.5	44	100	83	50	9	50	Red Brown Sand Gravel Clay	44
10.0	62	100	83	50	9	50	Red Brown Sand Gravel Clay	62
10.5	55 48	100	83	50	9	50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	55 48
11.5	31	100	83	50	9	50	Red Brown Sand Gravel Clay	31
12.0	28 25	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	28 25
13.0	37	100	83	50	9	50	Red Brown Sand Gravel Clay	37
13.5	58	100	83	50	9	50	Red Brown Sand Gravel Clay	58
14.0	42	100	83	50	9	50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	42
15.0	47	100	83	50	9	50	Red Brown Sand Gravel Clay	47
15.5 16.0	31 41	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	<u>31</u> 41
16.5	46	100	83	50	9	50	Red Brown Sand Gravel Clay	46
17.0	73	100	83	50	9	50	Red Brown Sand Gravel Clay	73 30
18.0	45	100	83	50	9	50	Red Brown Sand Gravel Clay	45
18.5	77	100	83	50	9	50	Red Brown Sand Gravel Clay	77
19.0	42	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	42
20.0	37	100	83	50	9	50	Red Brown Sand Gravel Clay	37
20.5	36	100	83	50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	36
21.5	20	100	83	50	9	50	Red Brown Sand Gravel Clay	20
22.0	31	100	83	50	9	50	Red Brown Sand Gravel Clay	31
22.5	26	100	83	50	9	50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	26
23.5	20	100	83	50	9	50	Red Brown Sand Gravel Clay	20
24.0	46 62	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	46 62
25.0	64	100	83	50	9	50	Red Brown Sand Gravel Clay	64
25.5	42	100	83	50	9	50	Red Brown Sand Gravel Clay	42
26.5	36	100	83	50	9	50	Red Brown Sand Gravel Clay	36
27.0	21	100	83	50	9	50	Red Brown Sand Gravel Clay	21
27.5	20	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	20
28.5	17	100	83	50	9	50	Red Brown Sand Gravel Clay	17
29.0	20	100	83	50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	20
30.0	10	100	83	50	9	50	Red Brown Sand Gravel Clay	10
30.5	15	100	83	50	9	50	Red Brown Sand Gravel Clay	15
31.5	21	100	83	50	9	50	Red Brown Sand Gravel Clay	21
32.0	37	100	83	50	9	50	Red Brown Sand Gravel Clay	37
32.5 33.0	22 28	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clav	22
33.5	19	100	83	50	9	50	Red Brown Sand Gravel Clay	19
34.0	28 34	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay	28
35.0	38	100	83	50	9	50	Red Brown Sand Gravel Clay	38
35.5	26	100	83	50	9	50	Red Brown Sand Gravel Clay	26
36.5	48 28	100	83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clay	48
37.0	31	100	83	50	9	50	Red Brown Sand Gravel Clay	31
37.5 38.0	20 15	100	83 83	50 50	9	50 50	Red Brown Sand Gravel Clay Red Brown Sand Gravel Clav	20 15
38.5	15	100	83	50	9	50	Red Brown Sand Gravel Clay	15
39.0 30 F	16	100	83	50	9	50	Very Soft Drilling, Light Brown Sandy Clay	16
40.0	7	100	83	50	9	50	Very Soft Drilling, Light Brown Sandy Clay	7
40.5	8	100	83	50	9	50	Very Soft Drilling, Light Brown Sandy Clay	8
41.0	8	100	83 83	50 50	9	50 50	Very Soft Drilling, Light Brown Sandy Clay Very Soft Drilling, Light Brown Sandy Clay	/ 8
42.0	7	100	83	50	9	50	Very Soft Drilling, Light Brown Sandy Clay	7
42.5 43.0	8	100	83 83	50 50	9	50 50	Very Soft Drilling, Light Brown Sandy Clay Very Soft Drilling, Light Brown Sandy Clay	8
43.5	9	100	83	50	9	50	Very Soft Drilling, Light Brown Sandy Clay	9
44.0	10	100	83	50	9	50	Very Soft Drilling, Light Brown Sandy Clay	10
44.5	14	100	83	50	9	50	Light Brown Chalk, Sand 50/50	14
45.5	16	100	83	50	9	50	Light Brown Chalk, Sand 50/50	16
46.5	10	100	83 83	50 50	9	50 50	Light Brown Chalk, Sand 50/50 Light Brown Chalk. Sand 50/50	16
47.0	19	100	83	50	9	50	White Chalk, Flint	19
47.5 48.0	28 17	100	83 83	50 50	9	50 50	White Chalk, Flint White Chalk Flint	28
48.5	26	100	83	50	9	50	White Chalk, Flint	26
49.0	22	100	83 83	50 50	9	50 50	White Chalk, Flint	22
40.0	20	100	00	50	3	50	with Others, Fille	20

Fontmell Close, St Albans		Driller	Forkers
		Rig Type	C6
Site Record of Rotary Borehole	Investigations	Casing dia (mm)	150
		Drill Bit Size (mm)	110
Borehole Number: BH217	Date: 18/01/16	Vert/Inc (°)	7

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(m)	Rate (s)	100	(RPM)	(BAR)	(BAR)	(m)	Concrete	Analysis
0.0	274	100	83	50	9	46.5	Concrete	
1.0	116	100	83	50	9	46.5	Concrete	
1.5	78	100	83	50	9	46.5	Concrete	
2.0	112	100	83	50	9	46.5	Concrete	
2.5	154	100	83	50	9	46.5	Concrete	
3.5	103	100	83	50	9	46.5	Concrete	
4.0	168	100	83	50	9	46.5	Concrete	
4.5	120	100	83	50	9	46.5	Concrete	120
5.0	32	20	83	50	9	46.5	Damp Black Muddy Fill	32
5.5	17	20	83	50	9	46.5	Damp Black Muddy Fill	8
6.5	12	20	83	50	9	46.5	Damp Black Muddy Fill	12
7.0	15	20	83	50	9	46.5	Damp Black Muddy Fill	15
7.5	19	20	83	50	9	46.5	Damp Black Muddy Fill	19
8.0	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
9.5	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
9.5	15	20	83	50	9	46.5	Damp Black Muddy Fill	15
10.0	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
10.5	25	20	83	50	9	46.5	Damp Black Muddy Fill	25
11.0	40	20	83	50	9	46.5	Damp Black Muddy Fill	40
12.0	13	20	83	50	9	46.5	Damp Black Muddy Fill	13
12.5	26	20	83	50	9	46.5	Damp Black Muddy Fill	26
13.0	12	20	83	50	9	46.5	Damp Black Muddy Fill	12
13.5	12	20	83	50	9	46.5	Damp Black Muddy Fill	12
14.0	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
14.5	10	20	83	50	9	46.5	Damp Black Muddy Fill	12
15.5	9	20	83	50	9	46.5	Damp Black Muddy Fill	9
16.0	2	20	83	50	9	46.5	Damp Black Muddy Fill	2
16.5	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
17.0	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
18.0	7	20	83	50	9	46.5	Damp Black Muddy Fill	7
18.5	9	20	83	50	9	46.5	Damp Black Muddy Fill	9
19.0	7	20	83	50	9	46.5	Damp Black Muddy Fill	7
19.5	7	20	83	50	9	46.5	Damp Black Muddy Fill	7
20.0	9	20	83	50	9	46.5	Damp Black Muddy Fill	9 10
20.0	10	20	83	50	9	46.5	Damp Black Muddy Fill	11
21.5	9	20	83	50	9	46.5	Damp Black Muddy Fill	9
22.0	10	20	83	50	9	46.5	Damp Black Muddy Fill	10
22.5	19	20	83	50	9	46.5	Damp Black Muddy Fill	19
23.5	59	20	83	50	9	46.5	Light to dark grev sand, chalk traces	59
24.0	23	20	83	50	9	46.5	Light to dark grey sand, chalk traces	23
24.5	17	20	83	50	9	46.5	Light to dark grey sand, chalk traces	17
25.0	14	20	83	50	9	46.5	Light to dark grey sand, chalk traces	14
25.5	43	100	83	50	9	46.5	Light brown sand and chalk	43
26.5	34	100	83	50	9	46.5	Light brown sand and chaik	34
27.0	29	100	83	50	9	46.5	Light brown sand and chalk	29
27.5	19	100	83	50	9	46.5	Light brown sand and chalk	19
28.0	40	100	83	50	9	46.5	Light brown sand and chalk	40
20.5	25	100	83	50	9	46.5	Light brown sand and chalk	25
29.5	22	100	83	50	9	46.5	Light brown sand and chalk	22
30.0	27	100	83	50	9	46.5	Light brown sand and chalk	27
30.5	26	100	83	50	9	46.5	Light brown sand and chalk	26
31.0	24	100	83	50	9	46.5	Light brown sand and chalk	24
32.0	20	100	83	50	9	46.5	Light brown sand and chalk	20
32.5	691	100	83	50	9	46.5	Light brown sand and chalk	691
33.0	43	100	83	50	9	46.5	Light brown sand and chalk	43
33.5	37	100	83	50	9	46.5	Light brown sand and chalk	37
34.0	42	100	03 83	50	9	40.5	Light brown sand and chalk	42
35.0	57	100	83	50	9	46.5	Light brown sand and chalk	57
35.5	29	100	83	50	9	46.5	Light brown sand and chalk	29
36.0	37	100	83	50	9	46.5	Light brown sand and chalk	37
36.5	46	100	83	50	9	46.5	Light brown sand and chalk	46
37.0	35 19	100	83 83	50 50	9	40.5	Light brown sand and chalk	19
38.0	20	100	83	50	9	46.5	Light brown sand and chalk	20
38.5	22	100	83	50	9	46.5	Light brown sand and chalk	22
39.0	19	100	83	50	9	46.5	White chalk, very hard flint bands	19
39.5	29	100	83	50	9	46.5	White chalk, very hard flint bands	29
40.0	41 21	100	03 83	50 50	9	40.5	White chalk, very hard flint bands	21
41.0	18	100	83	50	9	46.5	White chalk, very hard flint bands	18
41.5	145	100	83	50	9	46.5	White chalk, very hard flint bands	145
42.0	38	100	83	50	9	46.5	White chalk, very hard flint bands	38
42.5	28	100	83	50	9	46.5	White chalk, very hard flint bands	28
43.0	21	100	03 83	50	9	40.5	White chalk, very hard flint bands	21
44.0	25	100	83	50	9	46.5	White chalk, very hard flint bands	25
44.5	40	100	83	50	9	46.5	White chalk, very hard flint bands	40
45.0	37	100	83	50	9	46.5	White chalk, very hard flint bands	37
45.5	29	100	83	50	9	46.5	White chalk, very hard flint bands	29

Borehole Number: BH218

Site Record of Rotary Borehole Investigations

	Driller	Forkers
	Rig Type	C6
Investigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 19/01/16	Vert/Inc (°)	7

Meterage	Pene Rate (s)	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
0.0	276	100	83	(BAR) 50	(BAR) 9	100	Concrete	276
0.5	176	100	83	50	9	100	Concrete	176
1.0	62 70	100	83	50 50	9	100	Concrete	62 70
2.0	45	100	83	50	9	100	Concrete	45
2.5	65 64	100	83 83	50 50	9	100	Concrete	65
3.5	41	100	83	50	9	100	Concrete	41
4.0	40	100	83	50	9	100	Concrete	40
4.5 5.0	5	10	83	50	9	100	Soft Black Damp Muddy Fill	5
5.5	10	10	83	50	9	10	Soft Black Damp Muddy Fill	10
6.0 6.5	10	10	83 83	50 50	9	10	Soft Black Damp Muddy Fill Soft Black Damp Muddy Fill	10
7.0	14	10	83	50	9	10	Soft Black Damp Muddy Fill	14
7.5	11	10	83	50	9	10	Soft Black Damp Muddy Fill	11
8.5	5	10	83	50	9	10	Soft Black Damp Muddy Fill	5
9.0	8	10	83	50	9	10	Soft Black Damp Muddy Fill	8
9.5	8	10	83	50	9	10	Soft Black Damp Muddy Fill	8
10.5	10	10	83	50	9	10	Soft Black Damp Muddy Fill	10
11.0	7	10	83 83	50 50	9	10	Soft Black Damp Muddy Fill Soft Black Damp Muddy Fill	7
12.0	6	10	83	50	9	10	Soft Black Damp Muddy Fill	6
12.5	7	10	83	50	9	10	Soft Black Damp Muddy Fill	7
13.0	10	10	83	50	9	10	Soft Black Damp Muddy Fill	10
14.0	7	10	83	50	9	10	Soft Black Damp Muddy Fill	7
14.5 15.0	11	10	83 83	50 50	9	10	Soft Black Damp Muddy Fill Soft Black Damp Muddy Fill	11
15.5	12	10	83	50	9	10	Soft Black Damp Muddy Fill	12
16.0	12	10	83	50	9	10	Soft Black Damp Muddy Fill	12
17.0	13	10	83	50	9	10	Soft Black Damp Muddy Fill	14
17.5	7	50	83	50	9	10	Light grey sandy clay, chalk traces	7
18.0 18.5	9	50 50	83 83	50 50	9	10	Light grey sandy clay, chalk traces	9
19.0	10	50	83	50	9	10	Light grey sandy clay, chalk traces	10
19.5	17	50	83	50	9	10	Light brown to white sandy chalk, flint	17
20.0	32	50	83	50	9	10	Light brown to white sandy chalk, flint	32
21.0	12	50	83	50	9	10	Light brown to white sandy chalk, flint	12
21.5	18	50	83	50	9	50	Light brown to white sandy chaik, fiint Light brown to white sandy chaik, flint	18
22.5	20	50	83	50	9	50	Light brown to white sandy chalk, flint	20
23.0	12	50 50	83	50 50	9	50	Light brown to white sandy chalk, flint	12
24.0	15	50	83	50	9	50	Light brown to white sandy chalk, flint	15
24.5	30	50	83	50	9	50	Light brown to white sandy chalk, flint	30
25.0 25.5	24	50 50	83	50 50	9	50 50	Light brown to white sandy chalk, flint Light brown to white sandy chalk, flint	24
26.0	20	50	83	50	9	50	Light brown to white sandy chalk, flint	20
26.5	25	50 50	83 83	50 50	9	50 50	Light brown to white sandy chalk, flint	25
27.5	30	50	83	50	9	50	Light brown to white sandy chalk, flint	30
28.0	20	50	83	50	9	50	Light brown to white sandy chalk, flint	20
28.5	24	50	83	50	9	50	Light brown to white sandy chaik, fiint Light brown to white sandy chaik, flint	24
29.5	17	50	83	50	9	50	Light brown to white sandy chalk, flint	17
30.0 30.5	21	50 50	83	50 50	9	50 50	Light brown to white sandy chalk, flint	14
31.0	27	50	83	50	9	50	Light brown to white sandy chalk, flint	27
31.5	28	50	83	50	9	50	Light brown to white sandy chalk, flint	28
32.0	12	50	83	50	9	50	Light brown to white sandy chaik, fint	12
33.0	29	50	83	50	9	50	Light brown to white sandy chalk, flint	29
33.5 34.0	25 21	50 0	83 83	50 50	9	50 50	Light brown to white sandy chalk, flint Very Soft Drilling, Small Chalk Trace	25
34.5	6	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	6
35.0	6	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	6
36.0	3	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	3
36.5	4	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	4
37.0 37.5	4	0	83 83	50 50	9	50 50	Very Soft Drilling, Small Chalk Trace Very Soft Drilling, Small Chalk Trace	4
38.0	4	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	4
38.5	5	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	5
39.5	4	0	83	50	9	50	Very Soft Drilling, Small Chark Trace	4 4
40.0	4	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	4
40.5	5	0	83 83	50 50	9	50 50	Very Soft Drilling, Small Chalk Trace Very Soft Drilling, Small Chalk Trace	5 4
41.5	5	0	83	50	9	50	Very Soft Drilling, Small Chalk Trace	5
42.0	10	100	83	50	9	50	White Chalk, Flint Bands	10
43.0	12	100	83	50	9	50	White Chalk, Flint Bands	12
43.5	14	100	83	50	9	50	White Chalk, Flint Bands	14
44.0 44.5	15 27	100	83 83	50 50	9	50 50	White Chalk, Flint Bands White Chalk, Flint Bands	15
45.0	15	100	83	50	9	50	White Chalk, Flint Bands	15
45.5	20	100	83	50	9	50	White Chalk, Flint Bands	20
46.5	22	100	83	50	9	50	White Chalk, Flint Bands	22
47.0	19	100	83	50	9	50	White Chalk, Flint Bands	19
47.5 48.0	138	100	83 83	50 50	9	50 50	White Chark, Flint Bands White Chark, Flint Bands	138 17
48.5	24	100	83	50	9	50	White Chalk, Flint Bands	24
49.0 49.5	28	100	83 83	50 50	9	50 50	White Chalk, Flint Bands White Chalk, Flint Bands	28

Borehole Number: BH219

Site Record of Rotary Borehole Investigations

100 100

	Driller	Forkers
	Rig Type	C6
vestigations	Casing dia (mm)	150
	Drill Bit Size (mm)	110
Date: 25/01/16	Vert/Inc (°)	9

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
0.0	PIT	0	(KPIVI) 83	(BAR) 50	(BAR)	(III) 40	Trial Pit	Analysis
0.0	PIT	0	83	50	9	40	Trial Pit	PIT
1.0	7	10	83	50	9	40	Black Ash Stoney Fill	7
1.5	6	10	83	50	9	40	Black Ash Stoney Fill	6
2.0	7	10	83	50	9	40	Black Ash Stoney Fill	7
2.5	7	10	83	50	9	40	Black Ash Stoney Fill	7
3.0	6	10	83	50	9	40	Black Ash Stoney Fill	6
3.5	8	10	83	50	9	40	Black Ash Stoney Fill	8
4.0	7	10	83	50	9	40	Black Ash Stoney Fill	7
4.5	6	10	83	50	9	40	Black Ash Stoney Fill	6
5.0	7	10	83	50	9	40	Black Ash Stoney Fill	7
5.5	6	10	83	50	9	40	Black Ash Stoney Fill	6
6.0	20	10	83	50	9	40	Black Ash Stoney Fill	20
6.5	17	10	83	50	9	40	Black Ash Stoney Fill	17
7.0	17	10	83	50	9	40	Black Ash Stoney Fill	17
7.5	12	10	83	50	9 9	40	Black Ash Stoney Fill	12
8.0	12	10	83	50	y o	40	Black Ash Stoney Fill	12
8.5	12	10	83	50	9	40	Black Ash Stoney Fill Black Ash Stoney Fill	12
9.0	30	10	83	50	9	40	Black Ash Stoney Fill	30
10.0	42	10	83	50	9	40	Black Ash Stoney Fill	42
10.5	21	10	83	50	9	40	Black Ash Stoney Fill	21
11.0	37	100	83	50	ğ	40	Sand Gravel Boulders	37
11.5	41	100	83	50	9	40	Sand, Gravel, Boulders	41
12.0	43	100	83	50	9	40	Sand, Gravel, Boulders	43
12.5	29	100	83	50	9	40	Sand, Gravel, Boulders	29
13.0	41	100	83	50	9	40	Sand, Gravel, Boulders	41
13.5	37	100	83	50	9	40	Sand, Gravel, Boulders	37
14.0	38	100	83	50	9	40	Sand, Gravel, Boulders	38
14.5	137	100	83	50	9	40	Sand, Gravel, Boulders	137
15.0	133	100	83	50	9	40	Sand, Gravel, Clay	133
15.5	23	100	83	50	9	40	Sand, Gravel, Clay	23
16.0	28	100	83	50	9	40	Sand, Gravel, Clay	28
16.5	27	100	83	50	9	40	Sand, Gravel, Clay	27
17.0	22	100	83	50	y o	40	Sand, Gravel, Clay	22
17.5	24	100	03	50	9	40	Sand, Gravel, Clay	24
10.0	20	100	03	50	9	40	Light Brown Sandy Clay, Chalk Traces	20
19.0	16	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	16
19.5	19	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	19
20.0	28	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	28
20.5	23	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	23
21.0	28	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	28
21.5	31	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	31
22.0	22	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	22
22.5	32	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	32
23.0	25	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	25
23.5	26	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	26
24.0	25	100	83	50	9	40	Light Brown Sandy Clay, Chalk Traces	25
24.5	33	100	83	50	9	40	Chalk, Flint, Small Sand Trace	33
25.U 25.E	25 20	100	83	50	9	40	Chalk, Flint, Small Sand Trace	25
25.5	29	100	03	50	9	40	Chalk, Flint, Small Sand Trace	29
26.5	31 47	100	83	50	9	40	White Chalk Flint	47
27.0	34	100	83	50	9	40	White Chalk Flint	34
27.5	22	100	83	50	9	40	White Chalk, Flint	22
28.0	25	100	83	50	9	40	White Chalk, Flint	25
28.5	24	100	83	50	9	40	White Chalk, Flint	24
29.0	21	100	83	50	9	40	White Chalk, Flint	21
29.5	23	100	83	50	9	40	White Chalk, Flint	23
30.0	21	100	83	50	9	40	White Chalk, Flint	21
30.5	20	100	83	50	9	40	White Chalk, Flint	20
31.0	22	100	83	50	9	40	White Chalk, Flint	22
31.5	25	100	83	50	9	40	White Chalk, Flint	25
32.0	28	100	83	50	9	40	White Chalk, Flint	28
32.5	26	100	83	50	9	40	White Chalk, Flint	26
33.U	28 26	100	03 82	50	9	40	White Chalk, Flint	28
34.0	20	100	83	50	3	40	White Chalk, Flint	20
34.5	31	100	83	50	9	40	White Chalk Flint	31
35.0	34	100	83	50	9	40	White Chalk, Flint	34
35.5	24	100	83	50	9	40	White Chalk, Flint	24
36.0	26	100	83	50	9	40	White Chalk, Flint	26
36.5	22	100	83	50	9	40	White Chalk, Flint	22
37.0	20	100	83	50	9	40	White Chalk, Flint	20
37.5	24	100	83	50	9	40	White Chalk, Flint	24
38.0	28	100	83	50	9	40	White Chalk, Flint	28
38.5	20	100	83	50	9	40	White Chalk Flint	20

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### Fontmell Close, St Albans

Borehole Number: BH220

Site Record of Rotary Borehole Investigations

	Driller	Forkers							
Rig Type									
Investigations	Casing dia (mm)	150							
	Drill Bit Size (mm)	110							
Date: 25/01/16	Vert/Inc (°)	8							

Meterage	Pene	% Peturns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(m)	Rate (s)	76 Returns	(RPM)	(BAR)	(BAR)	(m)	Geology	Analysis
0.0	PIT	0	83	50	9	40	Trial Pit	
0.5	PII	0	83	50	9	40	I rial Pit	
1.0	7	10	83	50	9	40	Sand Gravel	7
2.0	6	10	83	50	9	40	Black Ash Stoney Fill	6
2.5	9	10	83	50	9	40	Black Ash Stoney Fill	9
3.0	10	10	83	50	9	40	Black Ash Stoney Fill	10
3.5	7	10	83	50	9	40	Black Ash Stoney Fill	7
4.0	7	10	83	50	9	40	Black Ash Stoney Fill	7
4.5	10	10	83	50	9	40	Black Ash Stoney Fill	10
5.0	21	10	83	50	y o	40	Black Ash Stoney Fill	21
5.5	10	10	03 83	50	9	40	Black Ash Stoney Fill	10
6.5	17	10	83	50	9	40	Black Ash Stoney Fill	17
7.0	21	10	83	50	9	40	Black Ash Stoney Fill	21
7.5	7	10	83	50	9	40	Black Ash Stoney Fill	7
8.0	11	10	83	50	9	40	Black Ash Stoney Fill	11
8.5	9	10	83	50	9	40	Black Ash Stoney Fill	9
9.0	14	10	83	50	9	40	Black Ash Stoney Fill	14
9.5	10	10	83	50	9	40	Black Ash Stoney Fill Dark Brown Sand Gravel	10
10.0	29	100	83	50	9	40	Dark Brown Sand Gravel	23
11.0	45	100	83	50	9	40	Dark Brown Sand Gravel	45
11.5	22	100	83	50	9	40	Dark Brown Sand Gravel	22
12.0	31	100	83	50	9	40	Dark Brown Sand Gravel	31
12.5	36	100	83	50	9	40	Dark Brown Sand Gravel	36
13.0	40	100	83	50	9	40	Dark Brown Sand Gravel	40
13.5	24	100	83	50	9	40	Dark Brown Sand Gravel	24
14.0	39	100	83	50	y o	40	Dark Brown Sand Gravel	39
14.5	49	100	83	50	9	40	Dark Brown Sand Gravel	49 51
15.5	23	100	83	50	9	40	Light Brown, Sand Chalk Trace	23
16.0	21	100	83	50	9	40	Light Brown, Sand Chalk Trace	21
16.5	19	100	83	50	9	40	Light Brown, Sand Chalk Trace	19
17.0	16	100	83	50	9	40	Light Brown, Sand Chalk Trace	16
17.5	16	100	83	50	9	40	Light Brown, Sand Chalk Trace	16
18.0	17	100	83	50	9	40	Pale Sand Chalk, Off White	17
18.5	17	100	83	50	9	40	Pale Sand Chalk, Off White Pale Sand Chalk, Off White	1/
19.0	21	100	83	50	9	40	Pale Sand Chalk, Off White	21
20.0	31	100	83	50	9	40	Pale Sand Chalk, Off White	31
20.5	21	100	83	50	9	40	Pale Sand Chalk, Off White	21
21.0	35	100	83	50	9	40	Pale Sand Chalk, Off White	35
21.5	37	100	83	50	9	40	Pale Sand Chalk, Off White	37
22.0	27	100	83	50	9	40	White Chalk, Flint	27
22.5	28	100	83	50	9	40	White Chalk, Flint	28
23.0	37	100	83	50	y o	40	White Chalk, Flint	37
23.5	22	100	83	50	9	40	White Chalk, Flint	22
24.5	22	100	83	50	9	40	White Chalk, Flint	21
25.0	21	100	83	50	9	40	White Chalk, Flint	21
25.5	20	100	83	50	9	40	White Chalk, Flint	20
26.0	20	100	83	50	9	40	White Chalk, Flint	20
26.5	18	100	83	50	9	40	White Chalk, Flint	18
27.0	19	100	83	50	9	40	White Chalk, Flint	19
27.5	24	100	83	50	9	40	White Chalk, Flint	24
28.5	19	100	83	50	9	40	White Chalk, Flint	19
29.0	20	100	83	50	9	40	White Chalk, Flint	20
29.5	16	100	83	50	9	40	Sandy Chalk 50/50	16
30.0	22	100	83	50	9	40	Sandy Chalk 50/50	22
30.5	23	100	83	50	9	40	Sandy Chalk 50/50	23
31.0	19	100	83	50	9	40	Sandy Chalk 50/50	19
31.5	18	100	83	50	9	40	Sandy Chalk 50/50	18
32.0	24	100	83	50	g	40	Sandy Chalk 50/50	24
32.5	18	100	83	50	9	40	Sandy Chalk 50/50	18
33.5	17	100	83	50	9	40	Firm White Chalk Flint	17
34.0	19	100	83	50	9	40	Firm White Chalk Flint	19
34.5	25	100	83	50	9	40	Firm White Chalk Flint	25
35.0	22	100	83	50	9	40	Firm White Chalk Flint	22
35.5	20	100	83	50	9	40	Firm White Chalk Flint	20
36.0	22	100	83	50	9	40	Firm White Chalk Flint	22
36.5	25	100	83	50	9	40	Firm White Chalk Flint	25
37.0	22	100	83	50	9	40	Firm White Obalk Flint	22
37.5	∠U 24	100	83	50	9	40 40	Firm White Chalk Flint	20
38.5	29	100	83	50	9	40	Firm White Chalk Flint	22
39.0	23	100	83	50	9	40	Firm White Chalk Flint	23
39.5	20	100	83	50	9	40	Firm White Chalk Flint	20

#### Fontmell Close, St Albans

Borehole Number: BH221

Site Record of Rotary Borehole Investigations

	Driller	Forkers								
	Rig Type									
Investigations	Casing dia (mm)	150								
	Drill Bit Size (mm)	110								
Date: 20/01/16	Vert/Inc (°)	15								

Meterage (m)	Pene Rate (s)	% Returns	Rotary Speed (RPM)	Applied Load (BAR)	Air Pressure (BAR)	Casing (m)	Geology	Provisional Analysis
0.0	PIT	100	83	50	9	42	Sand, Gravel	PIT
0.5	35	100	83	50	9	42	Sand, Gravel	35
1.5	20	100	83	50	9	42	Sand, Gravel	20
2.0	10	100	83	50	9	42	Sand, Gravel	10
2.5	17	100	83	50	9	42	Sand, Gravel	17
3.5	12	50	63 83	50	9	42	Black Ash, Stoney Clays, Fill, Damp	12
4.0	12	50	83	50	9	42	Black Ash, Stoney Clays, Fill, Damp	12
4.5	11	50	83	50	9	42	Black Ash, Stoney Clays, Fill, Damp	11
5.0	12	50 50	83	50	9	42	Black Ash, Stoney Clays, Fill, Damp Black Ash, Stoney Clays, Fill, Damp	12
6.0	8	50	83	50	9	42	Black Ash, Stoney Clays, Fill, Damp	8
6.5	13	50	83	50	9	42	Black Ash, Stoney Clays, Fill, Damp	13
7.0	22	50	83	50	9	42	Black Ash, Stoney Clays, Fill, Damp	22
7.5	30	50	83	50	9	42	Dark Brown Sandy Clays	30 72
8.5	66	100	83	50	9	42	Dark Brown Sandy Clay	66
9.0	52	100	83	50	9	42	Dark Brown Sandy Clay	52
9.5	41	100	83	50	9	42	Dark Brown Sandy Clay	41
10.0	47	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	47
11.0	50	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	50
11.5	27	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	27
12.0	38	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	<u>38</u>
13.0	46	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	46
13.5	50	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	50
14.0	48	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	48
14.5	68 41	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	41
15.5	27	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	27
16.0	53	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	53
16.5	33	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	33
17.0	29	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	31
18.0	39	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	39
18.5	36	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	36
19.0	27	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	27
20.0	32	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	32
20.5	53	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	53
21.0	39	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	39
21.5	66 43	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	<b>66</b> 43
22.5	27	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	27
23.0	20	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	20
23.5	23	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	23
24.0	31	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	31
25.0	29	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	29
25.5	27	100	83	50	9	42	Light Dark Brown Sand, Gravel, Clay	27
26.0	29	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk	29
20.0	30	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk	30
27.5	34	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk	34
28.0	30	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk	30
28.5	35 41	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk Pale Brown/ Off White Sandy Chalk	35 41
29.5	36	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk	36
30.0	38	100	83	50	9	42	Pale Brown/ Off White Sandy Chalk	38
30.5	46	100	83	50	9	42	White Chalk, flint parts	46
31.0	30	100	83	50	9	42	White Chalk, flint parts	30
32.0	41	100	83	50	9	42	White Chalk, flint parts	41
32.5	32	100	83	50	9	42	White Chalk, flint parts	32
33.0	35	100	83	50	9	42	White Chalk, flint parts	35
34.0	37	100	83	50	9	42	White Chalk, flint parts	37
34.5	51	100	83	50	9	42	White Chalk, flint parts	51
35.0	30	100	83	50	9	42	White Chalk, flint parts	30
35.5 36.0	23 22	100	83 83	50 50	9	42	White Chalk, flint parts	23
36.5	19	100	83	50	9	42	White Chalk, flint parts	19
37.0	17	100	83	50	9	42	White Chalk, flint parts	17
37.5	14	100	83	50	9	42	White Chalk, flint parts	14
38.5	21	100	83	50	9 9	42	White Chalk, flint parts	21
39.0	23	100	83	50	9	42	White Chalk, flint parts	23
39.5	27	100	83	50	9	42	White Chalk, flint parts	27
40.0	29	100	83	50 50	9	42	White Chalk, flint parts	29
41.0	20	100	83	50	9	42	White Chalk, flint parts	20
41.5	36	100	83	50	9	42	White Chalk, flint parts	36

#### Fontmell Close, St Albans

Borehole Number: BH222

Site Record of Rotary Borehole Investigations

	Driller	Forkers						
Rig Type								
Investigations	Casing dia (mm)	150						
	Drill Bit Size (mm)	110						
Date: 21/01/16	Vert/Inc (°)	14						

Meterage	Pene	% Returns	Rotary Speed	Applied Load	Air Pressure	Casing	Geology	Provisional
(m)	Rate (s)	<i>i</i> i notalilo	(RPM)	(BAR)	(BAR)	(m)	coology	Analysis
0.0	PIT	0	83	50	9	40	Trial Pit	PIT
0.5	15	100	83	50	9	40	Sand Gravel	15
1.0	21	100	83	50	9	40	Sand Gravel	21
1.5	23	100	83	50	9	40	Sand Gravel	23
2.0	14	100	83	50	9	40	Sand Gravel	14
2.5	13	100	83	50	9	40	Sand Gravel	13
3.0	12	50	83	50	9	40	Black Ash Stoney Fill	12
3.5	17	50	83	50	à	40	Black Ash Stoney Fill	17
4.0	18	50	83	50	9	40	Black Ash Stoney Fill	18
4.0	22	50	00	50	0	40	Black Ash Stoney Fill	22
4.5	17	50	03	50	9	40	Black Ash Stoney Fill	47
5.0	17	50	63	50	9	40	Black ASH Stoney Fill	17
5.5	15	50	83	50	9	40	Black Ash Stoney Fill	15
6.0	14	50	83	50	y	40	Black Ash Stoney Fill	14
6.5	21	50	83	50	9	40	Black Ash Stoney Fill	21
7.0	22	50	83	50	9	40	Black Ash Stoney Fill	22
7.5	15	100	83	50	9	40	Light Dark Brown Sand Gravel	15
8.0	40	100	83	50	9	40	Light Dark Brown Sand Gravel	40
8.5	21	100	83	50	9	40	Light Dark Brown Sand Gravel	21
9.0	35	100	83	50	9	40	Light Dark Brown Sand Gravel	35
9.5	30	100	83	50	9	40	Light Dark Brown Sand Gravel	30
10.0	27	100	83	50	9	40	Light Dark Brown Sand Gravel	27
10.5	45	100	83	50	9	40	Light Dark Brown Sand Gravel	45
11.0	3	100	83	50	9	40	Light Dark Brown Sand Gravel	3
11.5	33	100	83	50	9	40	Light Dark Brown Sand Gravel	33
12.0	51	100	83	50	9	40	Light Dark Brown Sand Gravel	51
12.5	30	100	83	50	9	40	Light Dark Brown Sand Gravel	30
13.0	36	100	83	50	9	40	Light Dark Brown Sand Gravel	36
13.5	25	100	83	50	à	40	Light Dark Brown Sand Gravel	25
14.0	38	100	83	50	9	40	Light Dark Brown Sand Gravel	38
14.5	43	100	83	50	9	40	Light Dark Brown Sand Gravel	43
15.0	34	100	83	50	9	40	Light Dark Brown Sand Gravel	34
15.0	16	100	00	50	0	40	Light Dark Brown Sand Gravel	16
10.0	10	100	03	50	9	40	Light Dark Brown Sand Gravel	10
16.0	33	100	03	50	9	40	Light Dark Brown Sand Gravel	33
16.5	44	100	63	50	9	40	Light Dark Brown Sand Gravel	44
17.0	40	100	83	50	9	40	Light Dark Brown Sand Gravel	40
17.5	20	100	83	50	9	40	Light Dark Brown Sand Gravel	20
18.0	26	100	83	50	g	40	Light Dark Brown Sand Gravel	26
18.5	31	100	83	50	9	40	Stiff Sandy Clay	31
19.0	33	100	83	50	9	40	Stiff Sandy Clay	33
19.5	31	100	83	50	9	40	Stiff Sandy Clay	31
20.0	32	100	83	50	9	40	Stiff Sandy Clay	32
20.5	26	100	83	50	9	40	Stiff Sandy Clay	26
21.0	19	100	83	50	9	40	Stiff Sandy Clay	19
21.5	38	100	83	50	9	40	Stiff Sandy Clay	38
22.0	45	100	83	50	9	40	Stiff Sandy Clay	45
22.5	48	100	83	50	9	40	Stiff Sandy Clay	48
23.0	37	100	83	50	9	40	Stiff Sandy Clay	37
23.5	41	100	83	50	9	40	Stiff Sandy Clay	41
24.0	46	100	83	50	9	40	Pale Brown Sandy Chalk	46
24.5	27	100	83	50	9	40	Pale Brown Sandy Chalk	27
25.0	19	100	83	50	9	40	Pale Brown Sandy Chalk	19
25.5	26	100	83	50	9	40	Pale Brown Sandy Chalk	26
26.0	23	100	83	50	9	40	Pale Brown Sandy Chalk	23
26.5	26	100	83	50	9	40	White Chalk, Flint Parts, Sand Trace	26
27.0	22	100	83	50	9	40	White Chalk, Flint Parts, Sand Trace	22
27.5	32	100	83	50	9	40	White Chalk Flint Parts Sand Trace	32
28.0	27	100	83	50	9	40	White Chalk Flint	27
28.5	18	100	83	50	9	40	White Chalk Flint	18
29.0	36	100	83	50	9	40	White Chalk Flint	36
20.0	41	100	83	50	9	40	White Chalk Flint	41
29.0	41	100	00	50	3	40	White Chalk Flint	41
30.0	41	100	03	50	Э	40	White Chalk Flint	41
30.5	19	100	03	50	Э	40	White Chalk Flint	19
31.0	∠0 27	100	03	50	Э	40	White Chalk Flint	20
31.5	27	100	83	50	9	40	White Chaik Flint	27
32.0	17	100	83	50	g	40	White Chalk Flint	1/
32.5	21	100	83	50	9	40	White Chalk Flint	21
33.0	19	100	83	50	9	40	White Chalk Flint	19
33.5	20	100	83	50	9	40	White Chalk Flint	20
34.0	24	100	83	50	9	40	White Chalk Flint	24
34.5	21	100	83	50	9	40	White Chalk Flint	21
35.0	19	100	83	50	9	40	White Chalk Flint	19
35.5	24	100	83	50	9	40	White Chalk Flint	24
36.0	19	100	83	50	9	40	White Chalk Flint	19
36.5	22	100	83	50	9	40	White Chalk Flint	22
37.0	23	100	83	50	9	40	White Chalk Flint	23
37.5	20	100	83	50	9	40	White Chalk Flint	20
38.0	19	100	83	50	9	40	White Chalk Flint	19
38.5	24	100	83	50	9	40	White Chalk Flint	24
39.0	28	100	83	50	9	40	White Chalk Flint	28
39.5	20	100	83	50	9	40	White Chalk Flint	20
					-			

	Fontm	nell Clo	ose, St	Albans		KEY Rate of		<	15 o 30													
	Drillin	a Sum	marvl	Record						p	penetation per 0.5m		30 t	o 60 50								
		gouin	inary i			1							1	1		<u> </u>						
From	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	H211	1212	1213	1214	1215	H216	1217	H218	1219	1220	1221	1222
Depth (m)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	(sec)	亩 (sec)	亩 (sec)
0.0	260 90	260 375	167 266	1300 630	393 544	125 241	195 112	330 270	150 260	166 201	343 266	375 262	210 73	320 137	<b>PIT</b> 21	PIT PIT	274 130	276 176	PIT PIT	PIT PIT	<b>PIT</b> 35	<b>PIT</b> 15
1.0	190 234	266 86					<mark>93</mark>						<b>87</b>		20	7	116		7	7	20	21
2.0	570		106		122	64 62	97	222	57				45	122	19	6	112	45	7	6	10	14
2.5	10	190	9	22	125	66 75	138	<b>104</b> 56			160	10	200 76	135 91	17	16	163	65 64	6	9 10	17	13
3.5 4.0	10 21	13 60	8	5 5	6 7	3	5 5	49 17	<mark>84</mark> 5	37 5	4	4	67 87	54 69	15 10	41 10	121 168	41 40	8	7 7	10 12	17 18
4.5	80 81	70 68	<b>279</b>	5	7	4	5	10	5	6	4	6	10	31	10	13	<b>120</b>	7	6	10	11	22
5.5	20	71	8	5	7	10	5	40	5	5	4	14	6	10	41	16	8	10	6	10	11	15
6.0 6.5	73 81	42 86	8	10	7	11 18	5	6 53	7	45 44	<b>91</b> 4	12	5	10 10		19 24	17	10 13	20	12	8	14 21
7.0 7.5	337 375		48 9	10 10	7	36 66	5	<b>70</b> 40	7	52 46	42	17 12	5 5	6 7		29 26	15 19	14 11	17 12	21 7	22 30	22 15
8.0	70		37	10	46 80		53	47	<b>70</b> 57	54	12	32	5	7	<b>63</b>	50 64	10	5	12	11 9	72 66	40
9.0	340		154	48			50	32	87 87	50	17	37	6	6	37	76	12	8	13	14	52	35
9.5 10.0	26			14	<b>64</b> 36	<b>95</b> 54	54 31	94 32	33	32	11	15 67	5	6	27	44 62	10	5 8	39 42	29	41 30	27
10.5 11.0	21 139			18 17	27 65	57 93	49 21	<mark>93</mark> 14	34 64	43 46	29 17	57 77	5 40	6 11	35 45	55 48	25 40	10 7	21 37	32 45	47 50	45 3
11.5	48		38	20	<b>130</b>	39	24	8	<b>82</b>	42	16	<b>157</b>	5	12	20	31	15	6	41	22	27	33
12.5	22	340	26		90	74	18	5	39	31	53	17	5	12	23	25	26	7	29	36	<mark>62</mark>	30
13.0 13.5	112 158	260 220	61 28	107 73		56 21	19 20	2	40 28	38 31	40	21 20	5	15 15	21 21	37 58	12 12	10	41 37	40 24	46 50	36 25
14.0 14.5	283 343	324 270		88 56	<b>134</b> 43	42 31	24 20	2	20 24	67 45	29 34	23 22	8	<u>30</u> 50	19 17	50 42	10 10	7	38 <b>137</b>	39 49	48 68	38 43
15.0	449			52	53	48	<mark>91</mark> 26	2	26	30	18	14	8	<b>70</b>	20	47	12	12	<b>133</b>	51	41	34
16.0	189	60	43	16	18	30	124	2	29	31	215	18	7	17	7	41	2	12	28	21	53	33
16.5 17.0	170 3655	30 36		42 43	21 24	51 150		2		<b>73</b> 59	<b>72</b> 57	14 18	7	15 17	6 9	46 <b>73</b>	10 10	13 14	27	19 16	33 29	44
17.5 18.0	1000 65	21 31	21 92	15 30	30 17	82 33	22 29	2	49 <b>109</b>	47 <b>70</b>	19 21	12	8	13 15	11 14	30 45	7	7	24 20	16 17	31 39	20 26
18.5	27	42	161	76	30	38	38	3	425		31	16	9	8	12	<b>77</b>	9	9	19	17	36	31
19.5	127	12	38	31	58	45	26	3	30	82	12	13	10	14	16	32	7	17	19	27	51	31
20.0 20.5	55 100	29 32		36 22		53 49	27 23	3	33 32	58 73	14 15	19 17	15 20	26 17	21 32	37 36	9 10	31 32	28 23	31 21	<u>32</u> 53	32 26
21.0 21.5	157 72	42	95 25	42 68		<b>73</b> 48	28 27	3	20 24	<b>77</b> 34	11 10	23 25	10 10	29 31	31	26 20	11 9	12 18	28 31	35 37	39 66	19 38
22.0	<mark>80</mark>	62 135	55		<mark>62</mark>	37	31	5	20	71 80	11	30	25	50	34	31	10	15	22	27	43	45
22.5	50	66	132	44	33	87 87	29	5	37	57	10	18	20	39	20	20	21	12	25	37	20	37
23.5 24.0	40	57 96	95 55	80 30	21 20		26 20	5	33		18 17	24 31	30 32	13 20	18 19	20 46	59 23	12 15	26 25	34 22	23	41 46
24.5 25.0	45 45			18 14	37 35		26	3	65 25		16 19	18 18	18	27 26	18	62 64	17	30 24	33	21	31 29	27 19
25.5	48	<mark>61</mark>	95	21	27		35	3	24		13	20	21	20	19	42	43	23	29	20	27	26
26.0		74	135	15	32	33	35	11	23	94 104	19	47	30	20	23	36	34	20	47	18	35	23
27.0 27.5		<u>59</u> 51		23	41 34	46	38	20 13	20 29		26 18	30 19	14 14	28 23	21 19	21 20	29 19	14 30	34 22	19 24	30 34	32
28.0 28.5		47 54	5580 55		58 61	34 48	33 32	12	25 25		40	21	31	35 31	43	19 17	40	20 24	25 24	19 18	<u>30</u> 35	27
29.0		70	132	47	43	35	42	18	27		26	18	18	19	44	20	23	28	21	20	41	36
30.0		00	190	22	55	42	36	12	24		24	26	5	23	19	10	27	14	23	22	38	41
30.5 31.0				42 52	<u>58</u> 40	57 70	62 13	17	20 25		25 40	21 15	5	20 40	22 17	15 15	26 24	21 27	20	23 19	46 41	19 26
31.5			208	60 66	43	34 54	27	26	28	220 195	22	22	5	12	16	21	19	28	25 28	18	30	27
32.5				72	32	37	35	48	22		17	27	9	15	28	22	691	18	26	18	32	21
33.0 33.5				48 70	34 35	40 24	42 35	26	21		43 27	22	8 9	10	23	28 19	43 37	29 25	28 26	19	35 43	20
34.0 34.5						39 42	38 36	21 26	26 30	190 166	28 26	29 26	25 25	17 10	24 22	28 34	31 42	21 6	32 31	19 25	37 51	24 21
35.0						29	<b>70</b>	35	35		24	27	22	12	22	38	57	6	34	22	30	19
35.5						52	41	17	38		26	20	20	22	23	48	37	3	24	20	23	19
36.5 37.0						30 24	37	19 17	35 40		23	20	27	18	27	28	46	4	22	25	19 17	22
37.5						22	28	16	28	60	28	26	20	10	21	20	19	4	24	20	14	20
38.0 38.5						17 15	54 38	23 21	32 37		56 40	35 39	10 10	18 20	23 19	15 15	20 22	4 5	28 20	24 22	19 21	19 24
39.0						17	39	27	34	54	38	32	10	15	34	16	19	4	25	23	23	28
39.5 40.0		-				20	34	14 23	- 37	51 <mark>80</mark>	41	35	10 30	15 25	36	18 7	41	4	24	20	27	20
40.5								30					10	19		8	21	5			31	
41.0 41.5								10		57			7	20		8	145	5			36	
42.0								15 28		<b>70</b>			15 14	22		7	38 28	10 14				
43.0								51		77			14	16		7	21	12				
43.5 44.0	-							59 <b>153</b>					17	20 14		9 10	23 25	14				
44.5													14	22		16	40	27				
45.0 45.5								211 141					12	21 18		14 16	29	15 20				
46.0								59 105					12	22		16	1430	22				
46.5 47.0										187			13	13		19		19				
47.5 48.0								81					19			28		138				
48.5													24	17		26		24				
49.0													28	18		22		28				



# Appendix 4: Trial Pit Sections



J:\36121 Fontmell Close, St Albans\03 Figures&Dwgs\Corel



J:\36121 Fontmell Close, St Albans\03 Figures&Dwgs\Corel





# Appendix 5: Laboratory Test Certificates

## SUMMARY OF GEOTECHNICAL TESTING

Sample details								n Tests	6	Densit	Density Tests		Undrained Triaxial Compression			nemical Te	sts	
Borehole / Trial Pit	Sample Ref	Depth (m)	Туре	Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 µm (%)	Bulk Mg/m³	Dry Mg/m³	Cell Pressure kPa	Deviator Stress kPa	Shear Stress kPa	рН	2:1 W/S SO4 (g/L)	W/S Mg (mg/L)	Other tests and comments
BH102		12.50-12.95	В	Yellow and orange brown silty clayey sandy flint GRAVEL											7.5	0.04		Particle Size Distribution
BH103		11.00-12.00	в	Brown silty clayey very sandy fine to cobble sized GRAVEL											7.5	0.59		Particle Size Distribution
BH103	Combined Sample	15.50-18.95	D	Yellow brown and grey silty clayey fine SAND											7.2	0.33		Particle Size Distribution
BH103		21.50-21.95	в	Yellow brown gravelly sandy SILT and CLAY											7.2	0.40		Particle Size Distribution

Sample type: B (Bulk disturb.) BLK (Block) C (Core) D (Disturbed) LB (Large Bulk dist.) U (Undisturbed)

Checked and Approved by Project Number:	
GEO / 23639	()®
7 DWKC Project Name:	GEOLABS
FONIMELL CLOSE, ST ALBANS	
S Burke - Senior Technician 10/02/2016 36121	

Test Report By GEOLABS Limited Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX

Client : Peter Brett Associates, Caversham Bridge House, Waterman Place, Reading, Berkshire





## BS1377 : Part 2 : Clause 9 : 1990

## PARTICLE SIZE DISTRIBUTION

BH/TP No: Sample Ref. Depth (m): Sample Type

BH103 Combined Sample 15.50-18.95 D Description: Yellow brown and grey silty clayey fine SAND



