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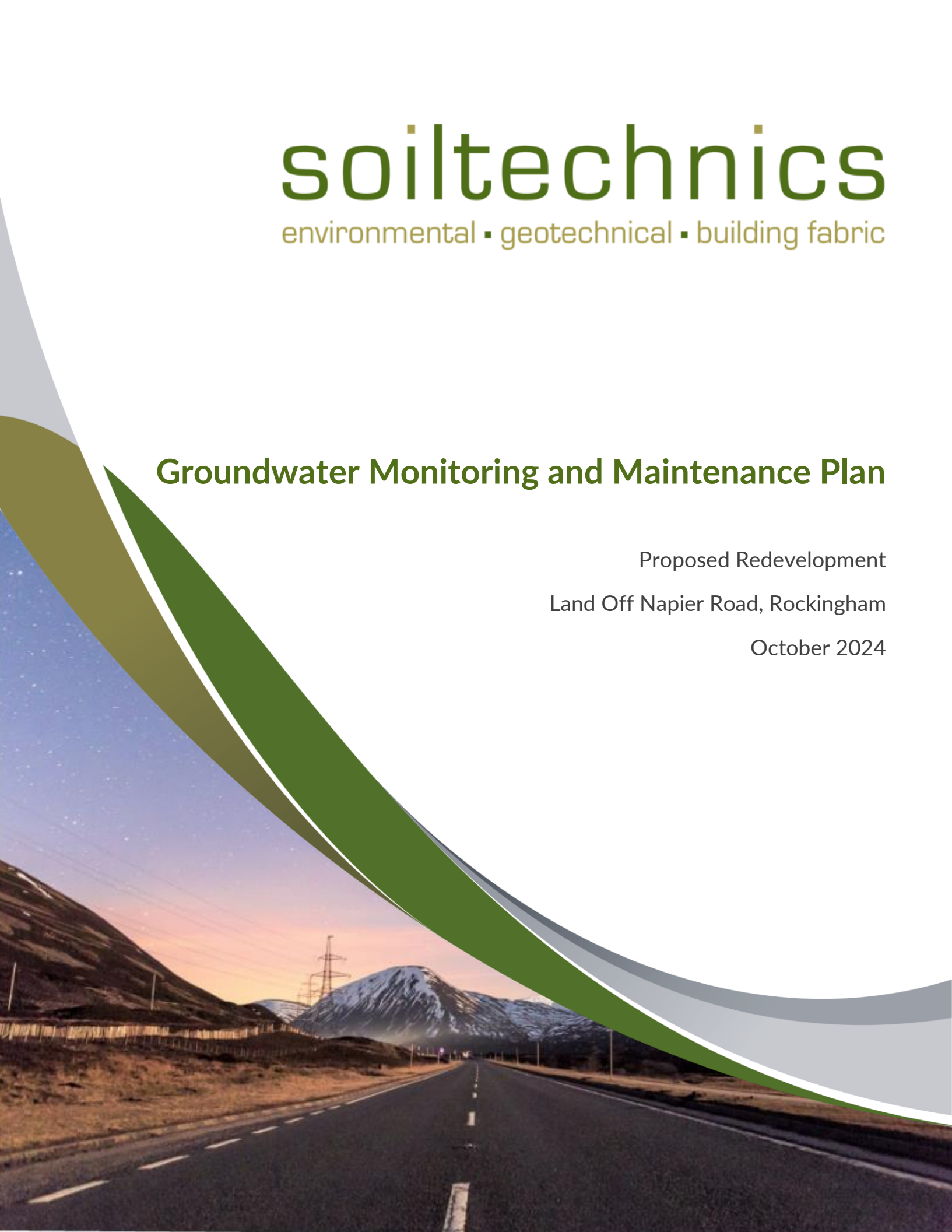
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Groundwater Monitoring and Maintenance Plan

Proposed Redevelopment

Land Off Napier Road, Rockingham

October 2024



Project Details

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1 Introduction

1.1 Scheme Outline

- 1.1.1 The development is controlled under the North Northamptonshire Council planning regime, under the planning application number NC/21/00072/OUT.
- 1.1.2 The project comprises the redevelopment of land off Napier Road, Rockingham Enterprise Area, Corby, NN17 5DP . Proposals are for the construction of an engineered platform to facilitate the development of a new employment park. The employment park will comprise 13 new commercial units with associated carparking, access roads, soft landscaping. An area along the southern boundary is to be retained as an open mosaic habitat and ecological habitat zone. Two proposed attenuation ponds are proposed in the southeast and southwest corners of the site respectively.
- 1.1.3 The site was formally a liquid waste treatment facility, for which the permit has been surrendered. Additionally, the site is also partially located on a landfill site, which is currently in formal closure. Prior to this, the site was quarried to remove material for use in the Corby Integrated Iron and Steel works.
- 1.1.4 A development platform is required to bring up ground levels to match the surrounding topography. It is estimated that the development platform will be constructed of approximately 686,000m³ of clay based waste and incinerator bottom ash (IBA) wastes from off-site sources.
- 1.1.5 A proposed layout is presented in Appendix A and an extract is shown below.

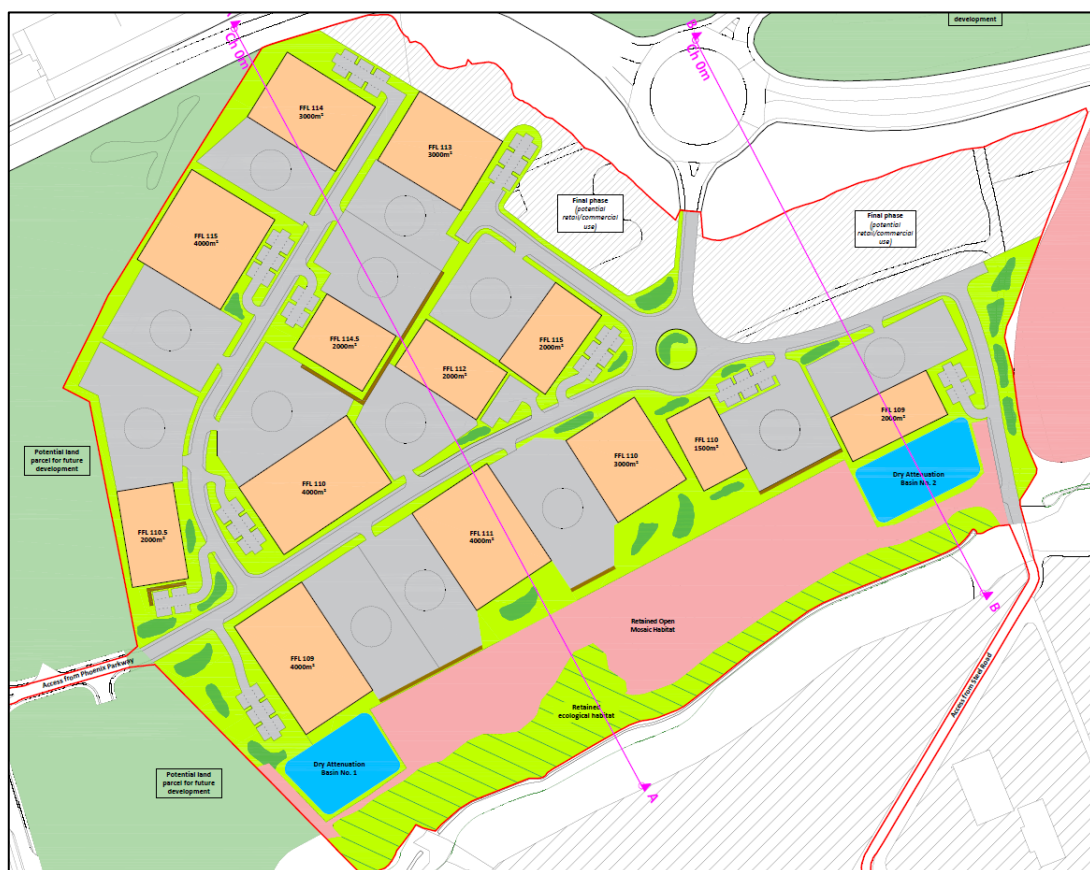


Figure 1-A: Proposed Development Plan

1.2 Brief

- 1.2.1 This report has been prepared following instructions received from Storefield Group Limited.
- 1.2.2 This report provides a Groundwater Monitoring and Maintenance Plan and details the proposed monitoring requirements prior to and following the installation of the engineered platform.
- 1.2.3 The report also includes a scheme for decommissioning existing boreholes prior to the placement of the engineered platform and for new boreholes upon completion of monitoring works.

1.3 Aims and Objectives

- 1.3.1 The principal aim of this report is to satisfy the brief and provide details of groundwater and surface water monitoring requirements to identify whether the placement of waste materials on site is having a detrimental effect on overall water quality. The scheme for decommissioning boreholes has also been produced.
- 1.3.2 The objectives of this report are outlined below:
- i) Provide a timetable for groundwater contamination monitoring.
 - ii) Provide a timetable for the submission of monitoring reports to the Local Authority during the Construction Period.
 - iii) Explain what and how the monitoring is to be carried out.
 - iv) Explain how the maintenance actions are to be carried out.
 - v) Provide details of any necessary contingency action(s) and long-term remediation measures that could arise from the monitoring and reports.
 - vi) Describe a scheme for decommissioning boreholes prior to commencement of the enabling works, and on completion of long term monitoring in the context of protecting groundwater.

1.4 Limitations

- 1.4.1 Soiltechnics disclaims any responsibility to our Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence in accordance with the terms of our contract, taking account of the resources, investigations and testing devoted to it by agreement with our Client. Soiltechnics accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

1.5 Previous reports

- 1.5.1 Reference has been made to the following reports in the preparation of this Monitoring and Maintenance Plan.

Author	Document Title	Date & Document Reference	Area of investigation
Soiltechnics Limited	Preliminary Investigation Report	R-STP3966D-P01 March 2019	Preliminary desk based investigation. Identifying the expected ground conditions and establishing potential pollutant linkages.
Soiltechnics Limited	Ground Investigation Report	R-STP3966D-G01 September 2020	Interpretive ground investigation report detailing ground conditions, identified pollutant linkages and geotechnical constraints.

Author	Document Title	Date & Document Reference	Area of investigation
Wardell Armstrong	Planning, Design and Access Statement	GM11841/REP-005 January 2021	A report providing a general overview of the scheme proposals, context and environmental setting.
Wardell Armstrong	Environmental Statement – Chapter 9: Drainage and Flood Risk Management	GM10604/REP-001 January 2021	The likely significant effects of the proposed development in terms of the drainage and flood risk in the context of the site and surrounding area.
Soiltechnics Limited	Ground Stability Report	R-STP3966D-S01 June 2023	Reporting providing geotechnical appraisal and comment on the geotechnical viability of the scheme.
Firth Consultants	Hydrogeological Risk Assessment	Report fc37266 June 2023	Qualitative hydrogeological risk assessment to assess the risk to controlled waters from the proposed use of inert waste and IBA to create a level development platform
Wardell Armstrong	Waste Recovery Plan	GM11841/REP-002 January 2024	Proposal for development platform to be constructed with waste materials to meet the EA's 'waste recovery test'
Wardell Armstrong	Operating Techniques	GM11841/REP-003 January 2024	A report providing management controls and designs for the site.
Soiltechnics Limited	Detailed Hydrogeological Risk Assessment	R-STP3966D-LQ-R01 October 2024	LandSim Analysis and detailed risk assessment to establish waste acceptance criteria.

Table 1-A: Summary of Previous Reports

2 The Site

2.1 Site Description

- 2.1.1 The proposed development lies within land off Napier Road in the Rockingham Enterprise Area, located in the northeast of Corby, Northamptonshire.
- 2.1.2 The postcode for the site is NN17 5DP and the site is accessed from Napier Road to the west. The site covers approximately 20.5 hectares. It is an unused parcel of land previously utilised as an extensive, former quarry and then closed landfill site.
- 2.1.3 The site is situated in the wider Rockingham Enterprise Area and as such, land to the north, east and west of the site is occupied by a mixture of commercial and industrial land use. Historic quarrying and infilling has resulted in a change in topographic levels both on and off site (further discussed in section 2.2).
- 2.1.4 The natural, local topography of the site and surrounding area generally falls to the east culminating at the low point of Willow Brook which forms the sites southern Boundary, as shown in the figure below.



Figure 2-A: Site Topography

2.2 Site History

- 2.2.1 A detailed site history is presented in the ground investigation report produced by Soiltechnics (ref. R-STP3966D-G01) and is summarised below.
- 2.2.2 The area was subject to opencast extraction of the iron rich deposits of the Northampton Sands (as a source of iron ore) in the 1940s / 1950s, forming part of Dene Quarry. Based on encountered ground conditions, the quarry was around 14m deep, and typically the 'overburden' soils (comprising Boulder Clays, Limestone and Estuarines) would have been used to backfill the excavation following removal of the iron ore.
- 2.2.3 Subsequent to quarrying activities, the southern part of the site was occupied by Candy filter sludge ponds, with North brook lagoons to the east, associated with adjacent steel works. These ponds / lagoons were licenced by the British Steel Corporation in the mid-1980s to receive industrial and special waste, and liquid sludge. It is understood that the lagoons were emptied by Tata Steel in recent years.
- 2.2.4 Records show the site was occupied by waste management facilities licenced to Corby Borough Council, Corus UK Ltd, and Tata Steel, between the mid-1980s until around 2010. These facilities included management of industrial and household wastes.

2.3 Geology

- 2.3.1 Broadly, the underlying geology comprises infilled ground overlying the Northampton Sand Formation (sandy ironstone) which in turn overlies the Whitby Mudstone Formation (mudstone and siltstone).
- 2.3.2 Landfill material was largely absent within the north of the site, encountered to a maximum depth of 0.80 m bgl and comprised suspected flue dusts, coke fines, slag and refractory rubble. Suspected blast furnace materials were encountered in the east from 2.0 m bgl. Reworked natural soils comprising a mixture of Glacial Till and Grantham Formation was encountered beneath the landfill material in the northern half of the site to depths of between 12.0 to 16.0 m bgl. Such Made Ground was recovered as grey, gravelly clay, creamish brown clayey, gravelly sand or gravelly clay or orange brown gravelly sands with frequent cobbles and boulders of sandstone.
- 2.3.3 Landfill material within the extent of the southern landfills extended to approx. 10 m depth and comprised sand, gravel and clay soils combined with variable content of limestone, concrete, brick, timber, metal, plastic, fabric, clinker and ash.
- 2.3.4 The Northampton Sand Formation was encountered from 10.50 m bgl with a thickness ranging from 0.6-2.9 m. The Whitby Mudstone was encountered at depths from 12.8-15.1 m bgl.
- 2.3.5 The figure below shows the approximate extent of the landfill cells on site.

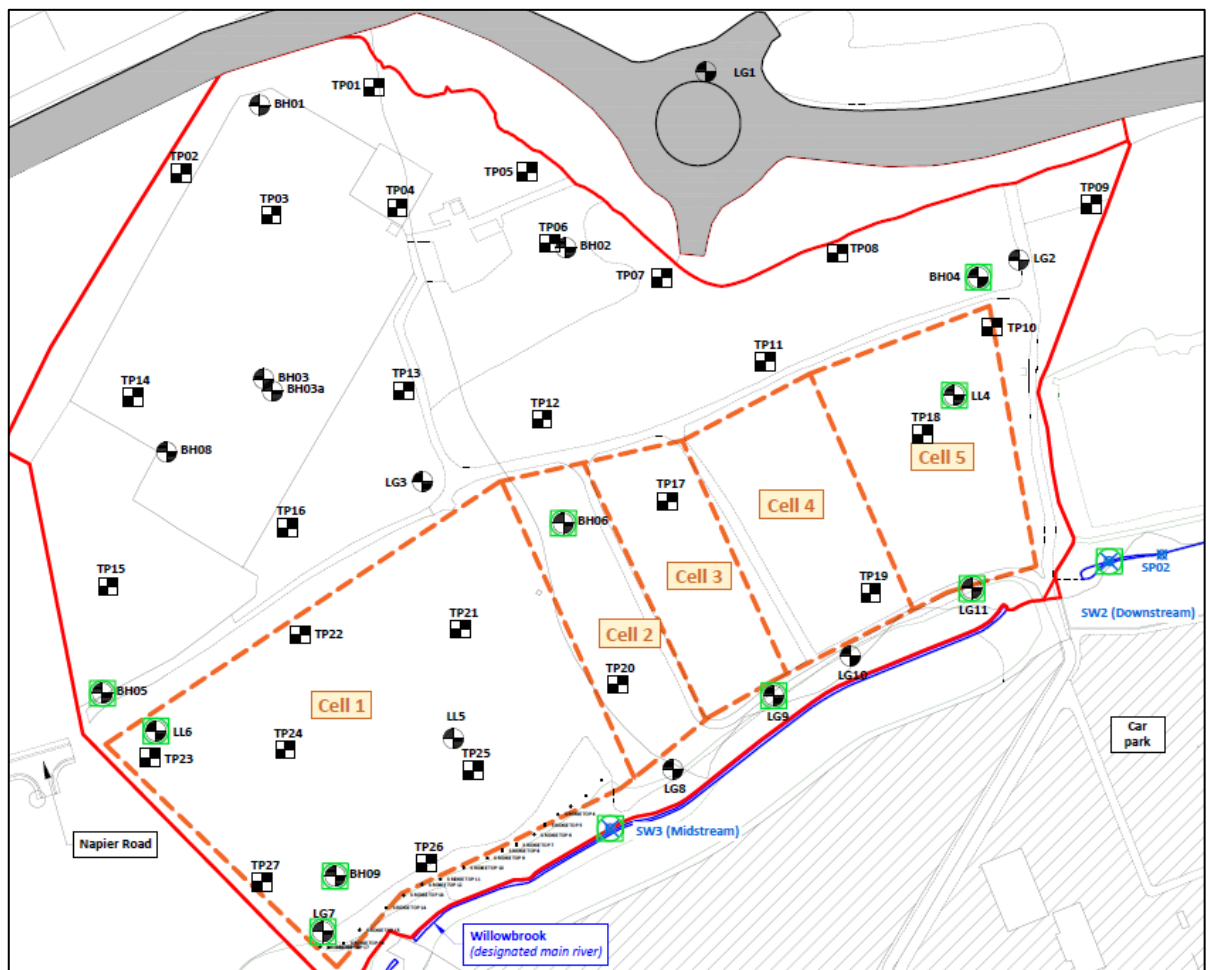


Figure 2-B: Landfill Extents, extracted from STP3966D-D09A.

2.3.6

A generalised geological cross section is presented within the qHRA, and extracted below for reference. However, it should be noted the section does not distinguish between existing landfill wastes and reworked natural soils, with both generically classified as Made Ground in the figure.

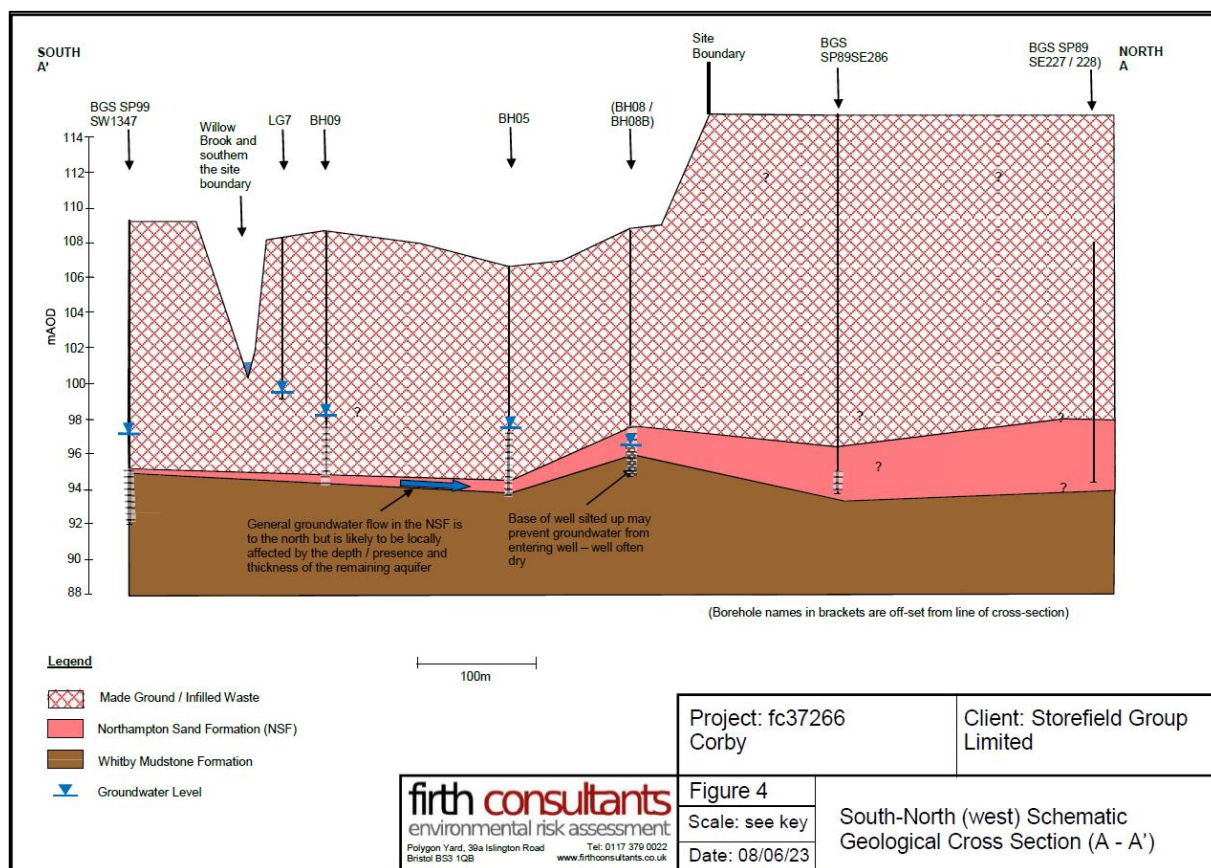


Figure 2-C: Geological Section (South-North)

2.4 Hydrogeology and Groundwater Sensitivity

- 2.4.1 The Northampton Sand Formation is designated as a Secondary A Aquifer. And the underlying Whitby Mudstone Formation is classified as unproductive strata.
- 2.4.2 The maximum proven thickness of the Northampton Sand Formation encountered on site is 2.90 m. Outside of the site's boundaries, the BGS records indicate the Northampton Sand Formation is typically less than 5.0 m in thickness.
- 2.4.3 The site is not located within a Source Protection Zone. There are no groundwater abstraction licenses held down-gradient of the site within 2km.
- 2.4.4 Willow Brook is located adjacent to the southern boundary of the site and flows easterly where it becomes the River Nene over 2km northeast of the site. The wider catchment area of the watercourse is classified as moderate for ecological and fail for chemical quality. There are no active licensed surface water abstractions within 2km of the site.
- 2.4.5 The groundwater flow direction is discussed in the qHRA, where flow direction is shown to be towards the north. The report also highlights that the elevation of the adjacent brook is higher than the underlying groundwater, indicating the groundwater does not discharge into the nearby watercourse, conversely the brook is likely to lose water to ground. The nearest plausible point of groundwater discharge was identified as being 1.3km northeast.

3 Well Selection

3.1 Summary of existing wells

- 3.1.1 Long term monitoring has been taking place at site for several years as part of the ongoing management and subsequent surrender of the former landfill permit.
- 3.1.2 Additional monitoring boreholes have also been installed as part of ground investigation works to enable the hydrogeological risk assessment to be completed for the planned development.
- 3.1.3 Locations of existing monitoring wells took into account topography, location of surface watercourses, site restrictions and the proposed development plans.
- 3.1.4 Throughout the monitoring period, three of the installed wells, BH01, BH02 and BH08 were found to be unserviceable due to them being backfilled/destroyed. As such three new boreholes, BH01B, BH02B and BH08B were drilled and installed adjacent to the unserviceable boreholes.
- 3.1.5 Existing monitoring well locations and the modelled groundwater flow direction are shown below.

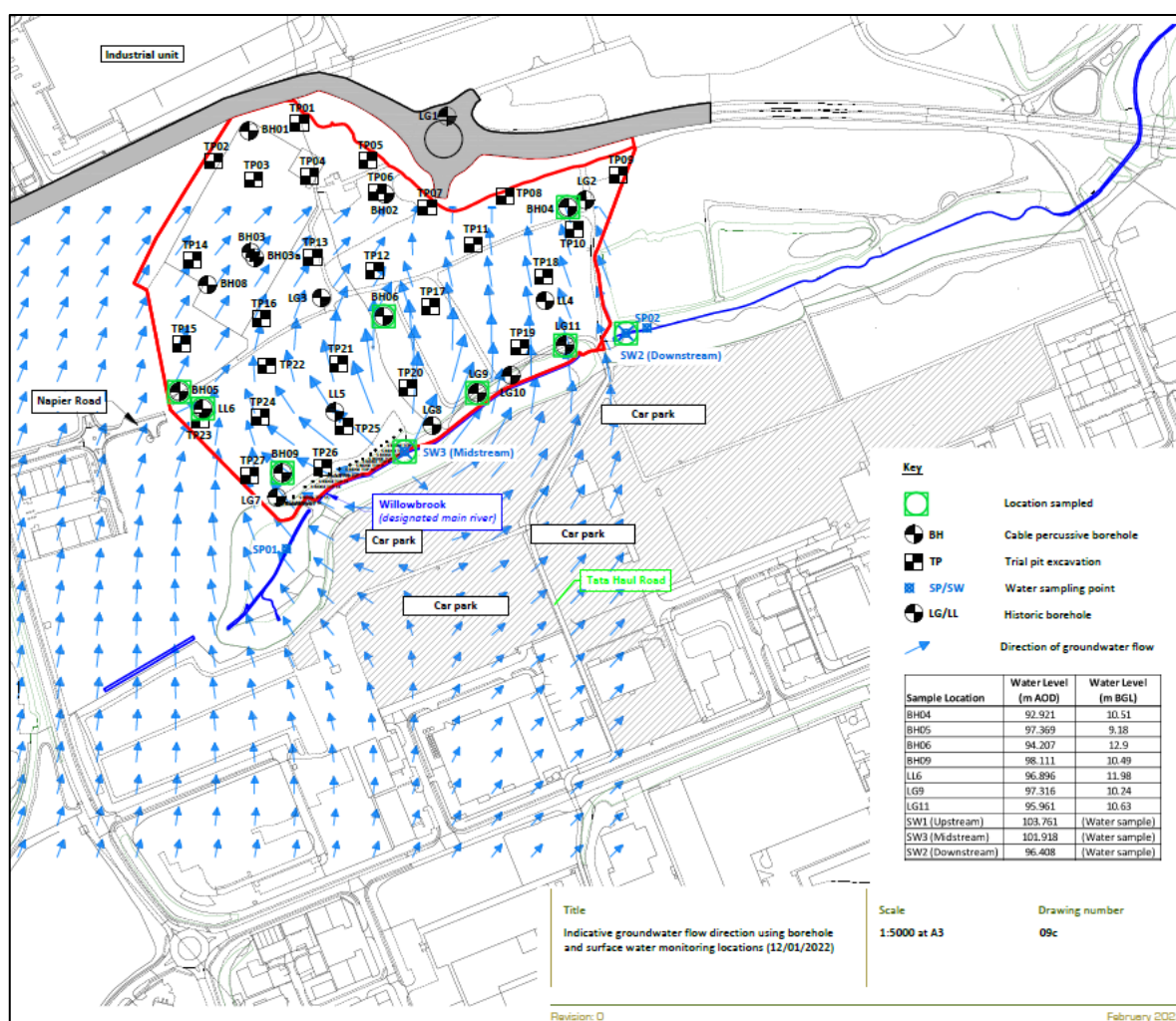


Figure 3-A: Existing Monitoring Well Locations

3.2 Well Requirements – Targeted Water Bodies

- 3.2.1 Whilst under construction, the proposed development platform is designed drain freely into the underlying soils, and the permeability is such that no build-up of leachate is anticipated. It is therefore not plausible to install leachate monitoring wells within the proposed imported waste materials and for it to be targeted as a distinct on site water body.
- 3.2.2 The existing underlying landfilled materials are also unlined and are considered to be in hydraulic continuity with the Secondary A Aquifer of the Northampton Sand Formation. As above, installing monitoring wells to distinguish between existing landfill leachate and groundwater is not plausible.
- 3.2.3 The monitoring strategy is therefore focussed on the groundwater aquifer only, with no specific leachate monitoring included.

3.3 Well Requirements – Placement

- 3.3.1 As the site levels are to be raised, by up to several metres, monitoring wells installed within the centre of the site must be protected, and extended during the works. It is recommended to use concrete rings to facilitate this.
- 3.3.2 To enable comparison with up-gradient fluctuations in groundwater quality, monitoring wells should be installed both up and down-gradient of the groundwater flow direction.
- 3.3.3 As boreholes installed to the base of the aquifer have been encountered as dry within the north of the site, selected monitoring wells must also include wells within the site and on all boundaries.

3.4 Replacement Monitoring Wells

- 3.4.1 Where construction works require the removal of a long term monitoring well, planned redundancy and well replacement must be undertaken. This includes the installation of a replacement borehole within the vicinity, and the undertaking of monitoring across both old and new wells for a minimum of two visits to allow for a new baseline to be established.
- 3.4.2 Any new monitoring wells installed for the long term monitoring of the aquifer should extend to the base of the Northampton Sand Formation and key into the underlying mudstone by 0.50m. Response zones should be 3m in length.

3.5 Selected Wells

3.5.1 The following wells and surface water monitoring points are proposed to be established as the long term monitoring locations for the development. Preference has been given to existing boreholes which have previously utilised to obtain groundwater quality data, to enable comparison with the extensive baseline dataset.

ID	Easting	Northing	Comment
BH01B	490020	291073	Existing well, installed to the base of the Northampton Sand Formation
BH02B	490191	290994	
BH04	490419	290979	Existing well, installed at the base of the Made Ground
BH05	489937	290749	
BH06	490191	290842	Existing well, installed to the base of the Northampton Sand Formation
BH08B	489972	290882	
LG7	490059	290615	Historic monitoring well, installed during former landfill operations
LG9	490307	290746	
LG11	490415	290808	
SW-U1	490092	290596	Upstream surface water sample
SW-D2	490491	290822	Downstream surface water sample

Table 3-A: Selected Long Term Monitoring Points

3.5.2 A site plan is provided below for reference.



Figure 3-B: Proposed Monitoring Locations

4 Monitoring Strategy

4.1 Monitoring Frequency

- 4.1.1 The establishment of a baseline is not considered necessary, as a significant dataset has already been established as part of the former landfill monitoring and subsequent ground investigation works.
- 4.1.2 Once works commence, the fill programme is expected to take between 4 to 7 years. It is recommended to undertake monitoring every 2 months during this period.
- 4.1.3 Once the filling period is complete, monitoring should continue on a quarterly basis up until the site's hardstanding, and drainage infrastructure is in place.
- 4.1.4 Following the completion of the works, two final rounds will be required, a minimum of one month apart.
- 4.1.5 All monitoring works will involve the sampling of surface and groundwaters along with a visual inspection of the adjacent brook to identify any visual or olfactory evidence of contamination, and a walkover around the perimeter of the site to identify any areas of leachate breakout.

4.2 Sampling Methodology

- 4.2.1 Groundwater sampling is to be through high-volume, high-flow techniques, such as through using a disposable grab-bailer, or inertial pump tubing.
- 4.2.2 Prior to sampling, the well is to be purged at 3 times the well volume to ensure the flushing of the well pack and clearance of any stale/stagnant water.
- 4.2.3 All instruments and monitoring equipment used during the collection of samples will be calibrated prior to use where required. Samples obtained from exploratory holes will be sent to independent accredited laboratories, with testing and analysis being undertaken following UKAS/MCERTS accredited procedures. Sampling containers used will be bespoke containers provided by the testing laboratory to ensure sample preservation is maintained.
- 4.2.4 All samples will be couriered to the testing laboratory within 48 hours.

4.3 Testing Suite

- 4.3.1 The Ground Investigation Report and hydrogeological risk assessments did not identify any significant VOC or SVOC contamination in total or leachable soil concentrations or within the groundwater. However, elevated levels of other inorganic, metal and organic (PAH) contaminants were detected.
- 4.3.2 The importing of IBA also presents a low risk from chloride, sulphate and antimony.
- 4.3.3 Ammonia has also been included as this can be an early indicator of excessive leachate release, along with pH, electrical conductivity, chemical oxygen demand and alkalinity, which can be generic indicators of groundwater contamination.

4.3.4 The testing suite for both surface and groundwater long term monitoring is to include:

- Banded Total Petroleum Hydrocarbons
- Polycyclic Aromatic Hydrocarbons (PAH) (USEPA 16 suite)
- Inorganics, including pH, sulphate, chloride, ammoniacal nitrogen, nitrate and nitrite, complex cyanide, pH, electrical conductivity, chemical oxygen demand and alkalinity.
- Metals, including antimony, manganese, zinc and boron.

4.4 Well Inspection and Maintenance

4.4.1 Wells are to be installed with protective concrete manhole rings at the commencement of filling works, and built up with levels during filling.

4.4.2 Potential pollutants (such as plant fuel) which could impact upon the condition of the well must be stored away from the well locations and the monitoring wells should not be blocked or covered at any time.

4.4.3 During the groundwater monitoring and programme, the physical condition of the well and the associated headworks are to be inspected during every sampling round to ensure that they are in a suitable physical condition to resist potential pollutant ingress and to obtain representative groundwater samples.

4.4.4 Where the headworks of a well have been damaged, all efforts should be made to repair the well. An additional spot groundwater sample should be obtained to ascertain whether the overall well construction has been compromised.

4.4.5 If any monitoring wells become damaged or compromised in any way during the course of the works that may affect their functioning, the default assumption is for the well to be re-drilled at a nearby location and prior to the next monitoring visit occurring. Where this is not possible, the regulator must be consulted.

4.5 Risk Assessment & Report Submissions

4.5.1 Soiltechnics will undertake a preliminary review of all laboratory and field data on completion of each monitoring round and provide a summary via e-mail to the developer.

4.5.2 If any significant deterioration of groundwater has been detected, Soiltechnics is to inform the regulator immediately, along with providing a report of all pertinent data collated to date.

4.5.3 Assuming favourable groundwater conditions are maintained, a formal monitoring report providing the data and an updated risk assessment will be submitted to the Local Authority every 12 months.

4.5.4 A final groundwater monitoring verification report will be submitted on completion of the groundwater monitoring phase and submitted to the Local Authority.

4.6 Monitoring Summary

4.6.1 A summary of the proposed monitoring strategy is presented below, with each visit comprising the sampling of 9 No. groundwater monitoring wells and 2 surface water monitoring points.

Aspect	Monitoring Frequency	Reporting
Baseline monitoring	N/A	Review and e-mail summary to the developer following every visit.
Construction works phase	Every two months, until completion of hardscaping and drainage.	
Completion	2 No. visits Minimum 1 month apart.	Formal monitoring report submitted to the Local Authority every 12 months, or upon detection of water quality deterioration.

Table 4-A: Monitoring Programme Summary

4.7 Contingency Measures

4.7.1 Localised fluctuations in groundwater quality may occur during and following significant filling periods. In the event of a single significant fall, or a consistent gradual fall in groundwater quality is detected, then Soiltechnics will advise the client to temporarily cease the related activities. Soiltechnics will then liaise with the regulators and establish a strategy for the progression of works to ensure groundwater quality is not compromised.

4.7.2 The outcome of deteriorating water quality being detected would be determined on a case specific basis, and could include any of the following:

- No action required.
- An increase in the monitoring frequency to obtain a better understanding of trends.
- The installation of additional monitoring wells to obtain a better resolution of conditions.
- A full review of the fill strategy and leachate management, with an options appraisal submitted to the regulator detailing feasible alternatives.

4.7.3 Any proposed amendments to the construction or remedial schemes must be submitted to the regulatory and agreed regulators ahead of any works.

5 Borehole Decommissioning

5.1 General

- 5.1.1 Prior to the placement of engineered fill to form the proposed development platform, all current wells not used within the monitoring programme are to be decommissioned. This includes:
- BH09,
 - LL4, LL5, LL6,
 - LG3, LG8, LG10
- 5.1.2 In the context of this site, the main considerations when designing the decommissioning of wells are to prevent the borehole acting as a conduit for contamination and to prevent the flow of groundwater from one geological horizon to another.
- 5.1.3 All obsolete wells within the landfill areas require decommissioning prior to the placement of the proposed development platform.

5.2 Decommissioning Phasing

- 5.2.1 Where possible, obsolete monitoring wells should be decommissioned ahead of the commencement of the enabling works phase.
- 5.2.2 Monitoring wells utilised for the long term groundwater monitoring programme should be decommissioned once the groundwater monitoring phase is complete and the verification report has been submitted to and approved by the regulator.

5.3 Unknown Monitoring Wells

- 5.3.1 Where construction works encounter previously unknown monitoring wells within the landfill area, works in the area should be temporarily halted, and Soiltechnics informed. The monitoring well should be decommissioned before works can recommence in that area.

5.4 Summary of Known Monitoring Wells

- 5.4.1 A plan showing the approximate location of all known monitoring wells is presented in Appendix A. Borehole logs from the recent phases of investigation are presented in Appendix B.

5.5 Decommissioning Methodology

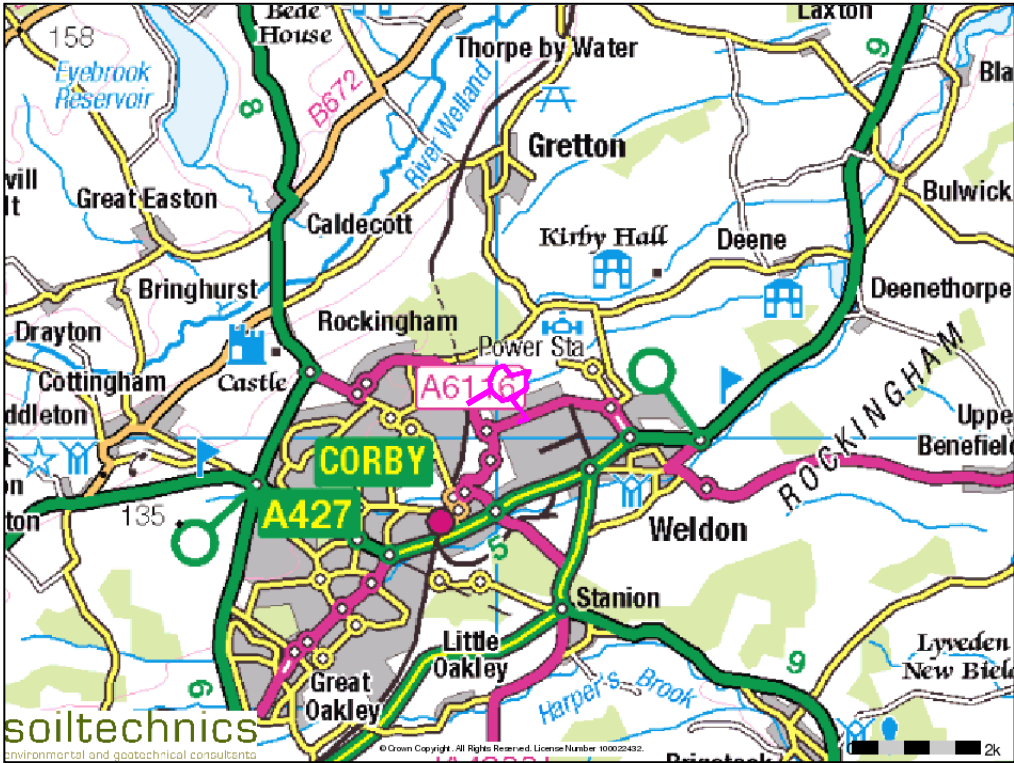
- 5.5.1 To minimise the likelihood of preferential pathways being established, utilising backfill materials with permeabilities as close to natural conditions as possible is not recommended.
- 5.5.2 Backfill materials should be of low permeability to reduce the potential for migration of contaminants and ground gases. Such as clay, bentonite-cement grout, or concrete.
- 5.5.3 As much of the shallow wells are in unsaturated conditions, backfilling with clay or bentonite pellets is not recommended. Concrete is not suitable due to the aggregate content increasing the likelihood of bridging. For this site, a bentonite-cement grout is recommended.

- 5.5.4 As the grout will be introduced in a liquid form, it should be introduced through an appropriate delivery pipe (e.g. tremie pipe), to ensure that voids do not form and to ensure the filling is complete below the water table..
- 5.5.5 The headworks and the top length of pipe (typically $\leq 1\text{m}$) should be removed during the decommissioning process. As the site is to undergo land raising, the installation of a concrete cap is not required, providing the bentonite-cement grout is placed up to surface.
- 5.5.6 Prior to decommissioning, an estimate of grout intake should be given based on the well construction, to enable a comparison within the field of estimate vs actual grout intake. This allows a field check to determine if bridging, or loss to the formation is occurring.
- 5.5.7 Voids may be present within the landfill and Made Ground soils, resulting in significant grout loss. Such occurrences should be documented.
- 5.5.8 All decommissioning should be undertaken by a competent geoenvironmental consultant, with records for each well maintained for inclusion into the Verification Report.

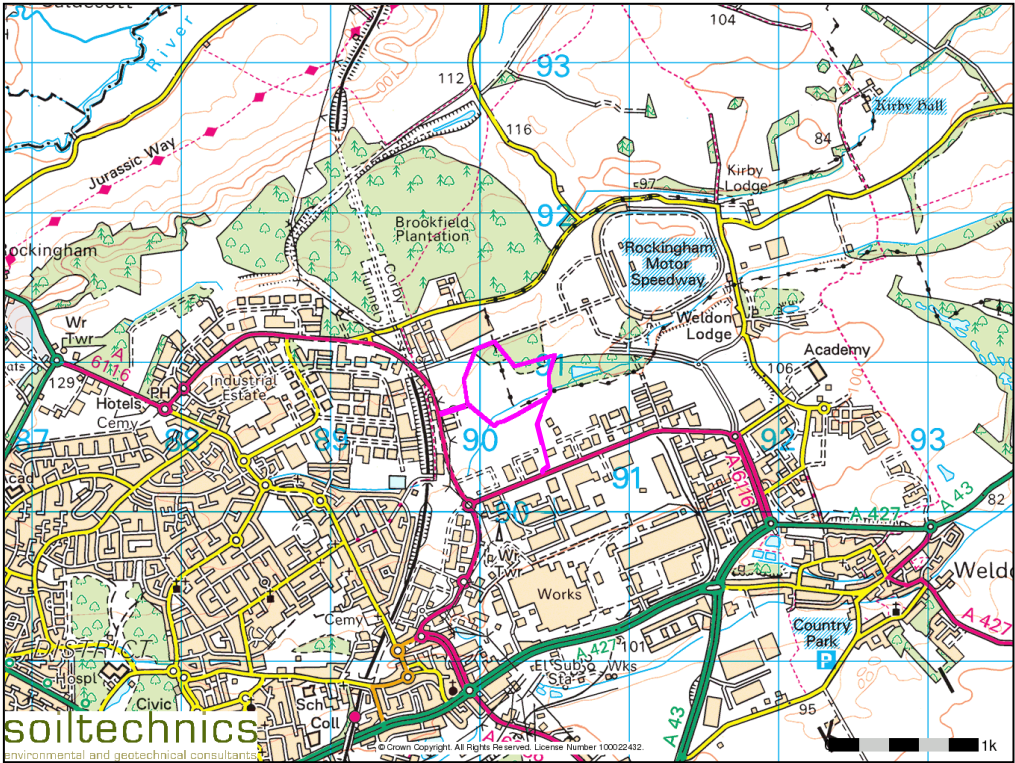
5.6 Verification Report

- 5.6.1 A decommissioning verification report will be required completion of the works, which include:
- The reasons for decommissioning.
 - Measurement of groundwater level prior to backfilling.
 - The depth and position of each layer of backfilling and sealing materials.
 - The type and quantity of backfilling and sealing materials used.
 - Any changes made to the borehole/well construction during the abandonment (for example casing and headworks removal).
 - Any problems encountered during the abandonment procedure
 - A comparison of estimated grout intake against actual grout intake

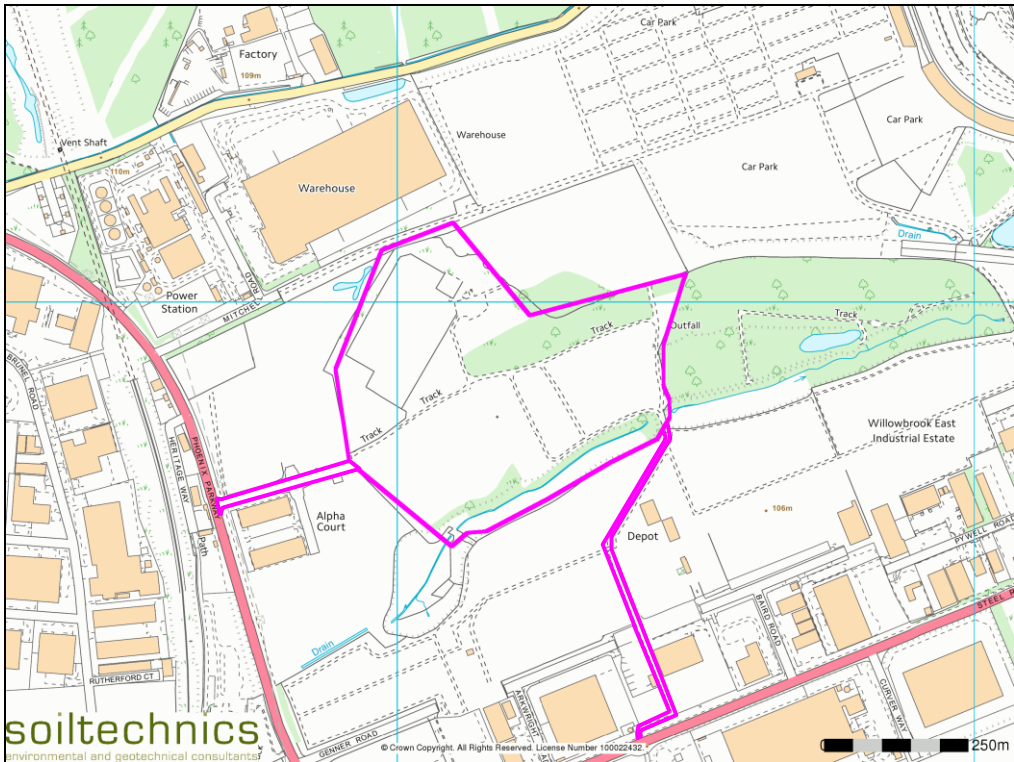
Appendix A Drawings



Neighbourhood extract from Ordnance Survey map

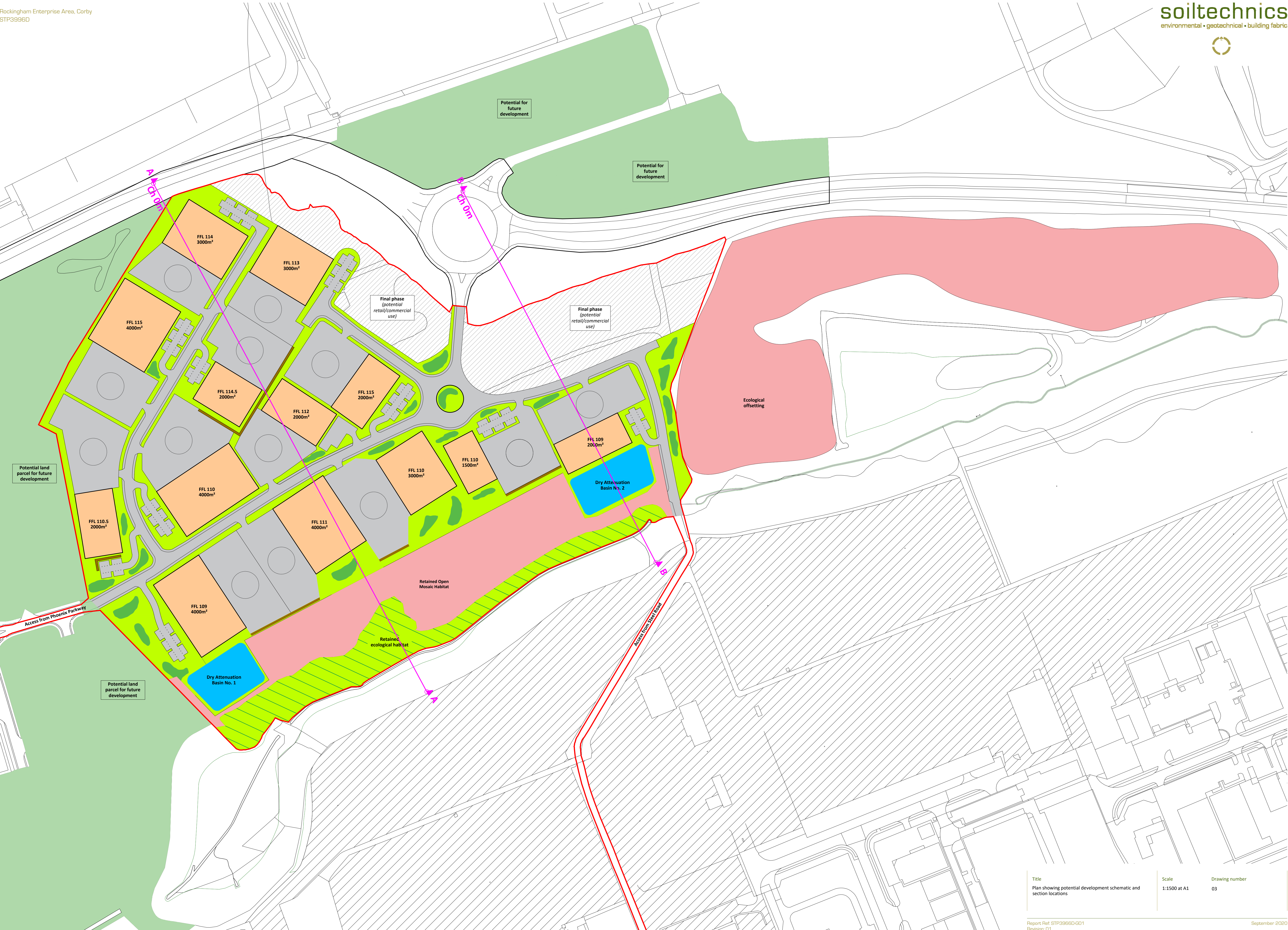


Town extract from Ordnance Survey map



Detail extract from Ordnance Survey map

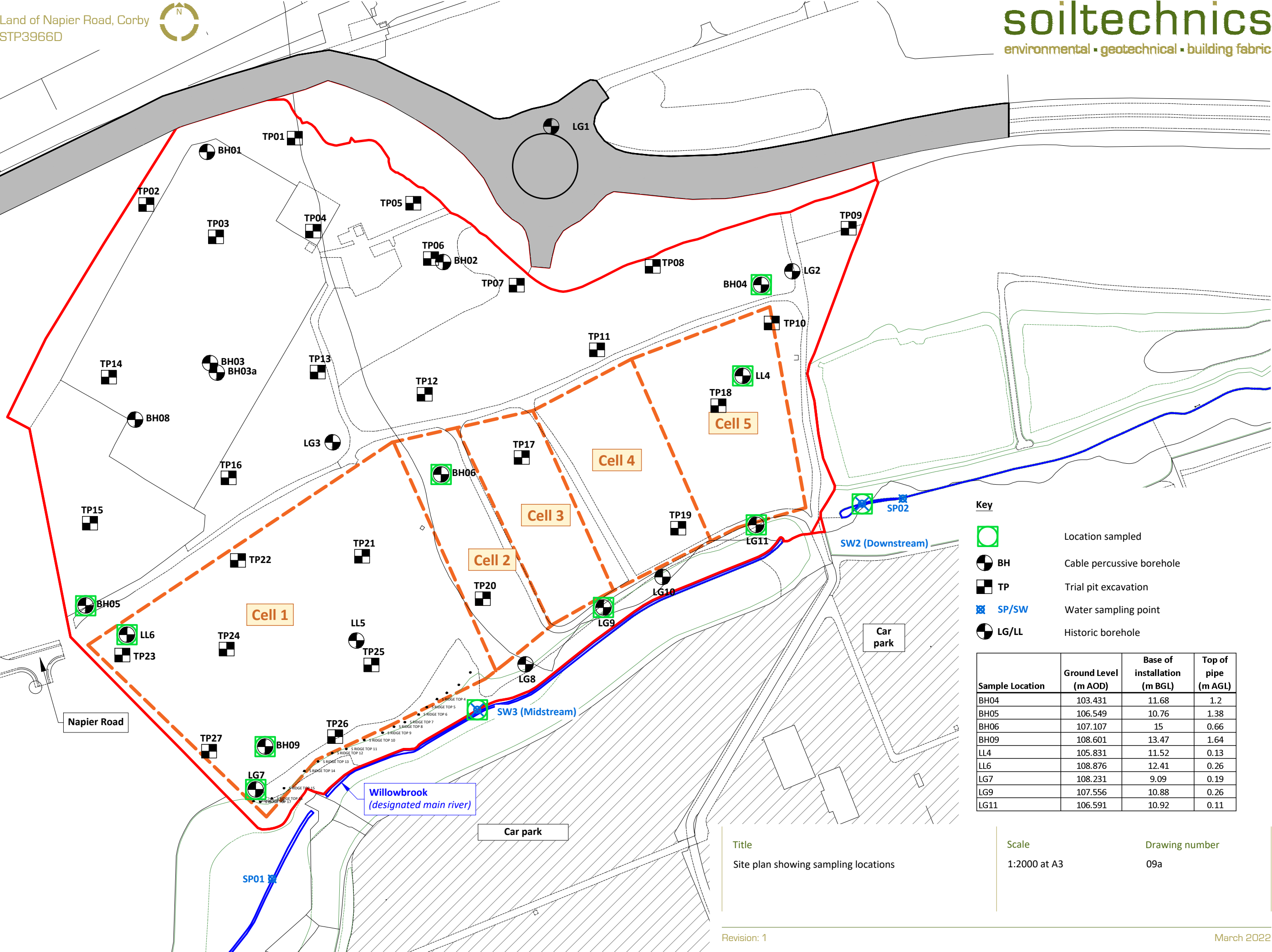
Title	Scale	Drawing number
Site location plan	Not to scale	01



Title
Plan showing potential development schematic and
section locations

Scale
1:1500 at A1

Drawing number
03



Appendix B Exploratory Hole Logs

Key to legends

Composite materials, soils and lithology					
	Topsoil		Made Ground		Boulders
	Clay		Coal		Cobbles
	Gravel		Limestone		Mudstone
	Sand		Sandstone		Silt
					Siltstone
					Peat
					Concrete
					Chalk

Note: Composite soil types are signified by combined symbols.

Key to 'test results' and 'sampling' columns

Test result		From (m) To (m)	Records depth of sampling	
Depth	Records depth that the test was carried out (i.e.: at 2.10m or between 2.10m and 2.55m)		D	Disturbed sample
			B	Bulk disturbed sample
			ES	Environmental sample
			SPTLS	SPT liner sample
		Type	W	Water sample
			U	Undisturbed thick-walled sample 100mm diameter sampler
			UT	Undisturbed thin walled sample 100mm diameter sampler
			UTF	Failed undisturbed sample
Result	PP – Pocket penetrometer result reported as an equivalent undrained shear strength (kN/m²) by applying a factor of 50. SV – Hand held shear vane result reported as an undrained shear strength (kN/m²). Where multiple readings are taken at the same level the average value is shown on the log. * Signifies that instrument limit reached. SPT – Standard Penetration Test result (N value uncorrected)^{1,2,3} SPT(c) – Standard Penetration Test result (solid cone) (N value) (uncorrected)^{1,2,3} * Signifies that the test was terminated before full penetration was achieved. UT – Undisturbed sample 100mm diameter sampler with number of blows of driving equipment required to obtain sample			
Sampling				

Note 1: Total seating blows recorded in brackets.

Note 2: Casing depth records depth of casing when SPT or SPT(c) was carried out.

Note 3: Water depth records depth of water when SPT or SPT(c) was carried out.

Water observations

Described at foot of log and shown in the 'water strike' column.

▼ Water level observed after specified delay in drilling

▽ Water strike

Density

Density recorded in brackets determined by qualitative field assessment or inferred from density testing and soil descriptions from across the site (i.e.: [Medium dense]).

Installation details

	Gravel filter		Bentonite
	Slotted pipe		Unslotted pipe
	Arisings		Grout
	Extensometer magnet		Vibrating wire piezometer

[illegible]

Notes 	Title Borehole record		Date(s) 11/05/2022
	Method Rotary core	Logged by NI	Sheet number Sheet 1 of 2
Groundwater observations No groundwater encountered.	Level (m OD) 109.00	Compiled by SA	Revision 0
	Co-ordinates 490019mE, 291070mN	Checked by AW	BH01B

[illegible]

Notes 	Title Borehole record		Date(s) 11/05/2022
	Method Rotary core	Logged by NI	Sheet number Sheet 2 of 2
Groundwater observations No groundwater encountered.	Level (m OD) 109.00	Compiled by SA	Revision 0
	Co-ordinates 490019mE, 291070mN	Checked by AW	BH01B

[illegible]

Notes 	Title Borehole record		Date(s) 11/05/2022
	Method Rotary core	Logged by NI	Sheet number Sheet 1 of 2
Groundwater observations No groundwater encountered.	Level (m OD) 106.98	Compiled by SA	Revision 0
	Co-ordinates 490181mE, 290993mN	Checked by AW	BH02B

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Soft slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular brick and concrete. (MADE GROUND)	10.00	96.98			10.00 - 11.50	67	0	0										
	[Loose] yellowish orange fine SAND. (NORTHAMPTON SAND FORMATION)	11.40	95.58			11.50 - 13.00	73	0	0										
						13.00 - 13.50	100	0	0										
	Stiff grey CLAY. (SUSPECTED WEATHERED WHITBY MUDSTONE) BOREHOLE TERMINATED AT 13.51m	13.50 13.51	93.48 93.47																

Notes	Title Borehole record		Date(s) 11/05/2022
	Method Rotary core	Logged by NI	Sheet number Sheet 2 of 2
Groundwater observations No groundwater encountered.	Level (m OD) 106.98	Compiled by SA	Revision 0
	Co-ordinates 490181mE, 290993mN	Checked by AW	BH02B

[illegible]

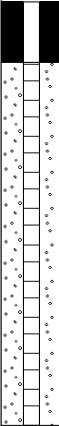
Notes 	Title Borehole record		Date(s) 11/05/2022
	Method Rotary core	Logged by NI	Sheet number Sheet 1 of 2
Groundwater observations No groundwater encountered.	Level (m OD) 108.90	Compiled by SA	Revision 0
	Co-ordinates 489966mE, 290877mN	Checked by AW	BH08B

INSTALL	STRATA				WATER STRIKES	CORING					SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		DEPTH (m)	TCR (%)	SCR (%)	RQD (%)	FI	TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Soft slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular brick and concrete. (MADE GROUND)	10.00	98.90			10.00 - 11.50	67	0	0										
	[Loose] yellowish orange fine SAND. (NORTHAMPTON SAND FORMATION)	11.40	97.50			11.50 - 13.00	67	0	0										
	Stiff grey CLAY. (WEATHERED WHITBY MUDSTONE)	12.90	96.00			13.00 - 14.00	50	0	0										
	BOREHOLE TERMINATED AT 14.00m	14.00	94.90																

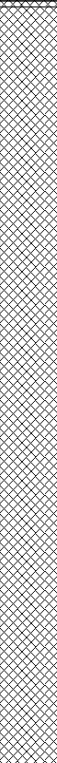
Notes	Title Borehole record		Date(s) 11/05/2022
	Method Rotary core	Logged by NI	Sheet number Sheet 2 of 2
Groundwater observations No groundwater encountered.	Level (m OD) 108.90	Compiled by SA	Revision 0
	Co-ordinates 489966mE, 290877mN	Checked by AW	BH08B

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Brown gravelly fine to medium SAND. Gravel consists of sandstone and limestone. (MADE GROUND)	0.10	109.03									0.10		ES
	Soft to firm grey mottled creamish brown slightly sandy slightly gravelly CLAY. Gravel consists of limestone and sandstone. (MADE GROUND)											0.50		ES
												1.00		ES
												2.00		ES
												3.00		ES
												4.00		ES
												5.00		ES
												6.00		ES
												7.00		ES
												8.00		ES
												9.00		ES
												10.00		ES
												11.00		ES
	BOREHOLE TERMINATED AT 12.00m	12.00	97.13											

Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to sandstone obstruction.	Chiselling details		Drilling details		Title Borehole record		Date(s) 23/07/2020
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Method Cable tool percussion	Logged by RT	Sheet number Sheet 1 of 1
	8.70 - 8.90 11.70 - 11.80	01:00 00:45	220	12.00			
Groundwater observations No groundwater encountered.	Water added details		Casing details		Level (m OD) 109.13	Compiled by KD	Revision 0
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	Co-ordinates -	Checked by SD	BH01
			220	6.00			

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto creamish brown slightly clayey gravelly fine to medium SAND. Gravel consists of limestone and slag. (MADE GROUND)	0.10	106.89									0.50		ES
	Firm brownish grey slightly sandy slightly gravelly CLAY. Gravel consists of sandstone. (MADE GROUND)											1.00		ES
												2.00		ES
												3.00		ES
												4.00		ES
												5.00		ES
												6.00		ES
												7.00		ES
	BOREHOLE TERMINATED AT 7.00m	7.00	99.99											

Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to sandstone obstruction.	Chiselling details		Drilling details		Title Borehole record		Date(s) 21/07/2020	
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Method Cable tool percussion	Logged by RT	Sheet number Sheet 1 of 1	
			220	7.00				
Groundwater observations No groundwater encountered.	Water added details		Casing details		Level (m OD) 106.99		Compiled by KD	Revision 0
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	Co-ordinates -	Checked by SD	BH02	
			220	6.00				

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto creamish brown slightly clayey gravelly fine to medium SAND. Gravel consists of limestone and slag. (MADE GROUND)	0.10	105.16									0.50		ES
	Firm grey mottled brown slightly sandy slightly gravelly CLAY. Gravel consists of limestone and brick. (MADE GROUND)											1.00		ES
												2.00		ES
												3.00		ES
												4.00		ES
												5.00		ES
												6.00		ES
												7.00		ES
												8.00		ES
												9.00		ES
												10.00		ES
												11.00		ES
												12.00		ES
	Weak dark grey SANDSTONE. (PROBABLE NORTHAMPTON SAND FORMATION)	12.70	92.56									13.00		ES
	BOREHOLE TERMINATED AT 14.10m	14.10	91.16									14.00		ES

Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to cable snapping and tools stuck in ground.	Chiselling details		Drilling details		Title Borehole record		Date(s) 14/07/2020 - 15/07/2020
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Method Cable tool percussion	Logged by RT	Sheet number Sheet 1 of 1
	13.70 - 14.10	02:00	220	14.00			
Groundwater observations No groundwater encountered.	Water added details		Casing details		Level (m OD) 105.26	Compiled by KD	Revision 0
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	Co-ordinates -	Checked by SD	BH03
			220	3.00			

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto creamish brown slightly clayey gravelly fine to medium SAND. Gravel consists of limestone and slag. (MADE GROUND)	0.10	105.20											
	Firm grey mottled brown slightly sandy slightly gravelly CLAY. Gravel consists of limestone and brick. (MADE GROUND)													
	Weak dark grey SANDSTONE. (PROBABLE NORTHAMPTON SAND FORMATION)	12.70	92.60											
	BOREHOLE TERMINATED AT 14.00m	14.00	91.30											

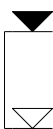
Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to sandstone obstruction.	Chiselling details		Drilling details		Title Borehole record		Date(s) 16/07/2020 - 21/07/2020	
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Method Cable tool percussion	Logged by RT	Sheet number Sheet 1 of 1	
			220	14.00				
Groundwater observations No groundwater encountered.	Water added details		Casing details		Level (m OD) 105.30		Compiled by KD	Revision 0
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	Co-ordinates -	Checked by SD	BH03a	
			220	14.00				

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Dark brown slightly clayey gravelly fine to medium SAND. Gravel consists of slag. (MADE GROUND) <i>...from 0m depth, organic odour observed.</i>	0.60	102.79									0.50		ES
	Creamish brown mottled grey very clayey gravelly fine to coarse SAND. Gravel consists of sandstone. (MADE GROUND) <i>...from 0.6m depth, pockets of firm grey clay.</i>											1.00		ES
												2.00		ES
												3.00		ES
												4.00		ES
												5.00		ES
												6.00		ES
												7.00		ES
												8.00		ES
												9.00		ES
												10.00		ES
												10.10		W
												11.00		ES
												12.00		ES
	Brown clayey gravelly fine to coarse SAND. Gravel consists of sandstone. (PROBABLE NORTHAMPTON SAND FORMATION) BOREHOLE TERMINATED AT 12.30m	11.90 12.30	91.49 91.09											

Notes Inspection pit excavated to 1.2m depth. Borehole terminated due to sandstone obstruction.	Chiselling details		Drilling details		Title Borehole record		Date(s) 23/07/2020
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Method Cable tool percussion	Logged by RT	Sheet number Sheet 1 of 1
	8.20 - 8.40 12.20 - 12.30	01:00 01:00	220 170	7.00 12.30			
Groundwater observations Groundwater strike at 11m depth, filling borehole to 11.6m in 5 minutes, 11.4m in 10 minutes, 11.2m in 15 minutes and 11.2m in 20 minutes.	Water added details		Casing details		Level (m OD) 103.39	Compiled by KD	Revision 0
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	Co-ordinates -	Checked by SD	BH04
			220 170	6.00 12.00			

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto brown gravelly fine to medium SAND. Gravel consists of concrete and brick. (MADE GROUND)											0.10		ES
												0.50		ES
												1.00		ES
	CONCRETE. (MADE GROUND)	1.30	105.30											
	Soft brownish grey slightly sandy slightly gravelly CLAY. Gravel consists of concrete, brick and plastic. (MADE GROUND)	1.50	105.10											
												2.00		ES
												3.00		ES
	Brownish grey clayey gravelly fine to medium SAND. Gravel consists of concrete and brick. (MADE GROUND)	3.20	103.40									4.00		ES
												5.00		ES
												6.00		ES
												7.00		ES
												8.00		ES
												9.00		ES
												10.00		ES
												11.00		ES
	Firm to stiff red brown slightly sandy CLAY. (MADE GROUND)	11.80	94.80									12.00		ES
		12.20	94.40									12.50		ES
	Orangish brown gravelly medium to coarse SAND. Gravel consists of ferruginous sandstone and ironstone. (PROBABLE NORTHAMPTON SAND FORMATION)	12.80	93.80									13.00		D
	Stiff grey silty CLAY. (WHITBY MUDSTONE FORMATION)	13.00	93.60											
BOREHOLE TERMINATED AT 13.00m														

Notes	Chiselling details		Drilling details		Title		Date(s)
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Borehole record		09/07/2020 - 13/07/2020
					Method	Logged by	Sheet number
Inspection pit excavated to 1.2m depth.	1.30 - 1.50	01:00	220 170	12.00 13.00	Cable tool percussion	RT	Sheet 1 of 1
Groundwater observations	Water added details		Casing details		Level (m OD)	Compiled by	Revision
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	106.60	KD	0
					Co-ordinates	Checked by	BH05
Groundwater strike at 12.2m depth, filling borehole to m in 5 minutes, m in 10 minutes, m in 15 minutes and 11m in 20 minutes. Sealed off with casing at 13.2m.			220 170	6.00 12.80	-	SD	

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING				
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE		
	Grass onto gravelly fine to medium SAND with many rootlets throughout. Gravel consists of slag. (MADE GROUND)	0.10	106.89									0.50		ES		
	CONCRETE. (MADE GROUND)	0.40	106.59										1.00		ES	
	Brownish grey gravelly SAND. Gravel consists of concrete, brick, tile, glass, metal, voids and paper. (MADE GROUND)												2.00		ES	
													3.00		ES	
	CONCRETE. (MADE GROUND)	3.90	103.09										4.00		ES	
	Soft grey slightly sandy slightly gravelly CLAY. Gravel consists of brick and slag. (MADE GROUND)	4.20	102.79										5.00		ES	
													6.00		ES	
													7.00		ES	
													8.00		ES	
	Grey gravelly fine to medium SAND. Gravel consists of brick. (MADE GROUND)	8.80	98.19										9.00		ES	
	Soft grey slightly sandy CLAY. (MADE GROUND)	10.00	96.99										10.00		ES	
													11.00		ES	
													12.00		ES	
	Orangish brown clayey gravelly medium to coarse SAND. Gravel consists of ironstone and ferruginous sandstone. (PROBABLE NORTHAMPTON SAND FORMATION)	12.20	94.79										12.50		ES	
													12.94		W	
		14.50	92.49													

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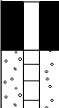
Notes	Chiselling details		Drilling details		Title		Date(s)
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Borehole record		13/07/2020 - 14/07/2020
					Method	Logged by	Sheet number
Groundwater observations Groundwater strike at 13.2m filling borehole to 12m in 5 minutes, 11.9m in 10 minutes, 11.8m in 15 minutes and 11.6m after 20 minutes. Borehole sealed off at 15.5m.			220	12.00	Cable tool percussion	RT	Sheet 1 of 2
			170	16.00			
	Water added details		Casing details		Level (m OD)	Compiled by	Revision
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	106.99	KD	0
			220	6.00	Co-ordinates -	Checked by SD	BH06
		170	15.00				

[illegible]

Notes	Chiselling details		Drilling details		Title		Date(s)
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Borehole record		13/07/2020 - 14/07/2020
	14.80 - 15.10	01:00	220 170	12.00 16.00	Method	Logged by	Sheet number
					Cable tool percussion	RT	Sheet 2 of 2
Groundwater observations	Water added details		Casing details		Level (m OD)	Compiled by	Revision
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	106.99	KD	0
			220 170	6.00 15.00	Co-ordinates	Checked by	BH06
Groundwater strike at 13.2m filling borehole to 12m in 5 minutes, 11.9m in 10 minutes, 11.8m in 15 minutes and 11.6m after 20 minutes. Borehole sealed off at 15.5m.				-	SD		

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Grass onto dark brown clayey gravelly fine to medium SAND. Gravel consists of brick and slag. (MADE GROUND)	0.60	108.33								0.50		ES	
	Soft to firm grey mottled creamish brown slightly sandy slightly gravelly CLAY. Gravel consists of sandstone. (MADE GROUND)										1.00		ES	
											2.00		ES	
											3.00		ES	
											4.00		ES	
											5.00		ES	
											6.00		ES	
											7.00		ES	
											8.00		ES	
											9.00		ES	
											10.00		ES	
											11.00		ES	
											12.00		ES	
											13.00		ES	
											14.00		ES	
		14.41	W											

Notes Inspection pit excavated to 1.2m depth.	Chiselling details		Drilling details		Title Borehole record		Date(s) 24/07/2020
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Method Cable tool percussion	Logged by RT	Sheet number Sheet 1 of 2
	10.20 - 10.40 13.70 - 14.00	01:00 01:00	220 170	14.00 16.50			
Groundwater observations Groundwater strike at 15.2m depth, filling borehole to 15m in 5 minutes, 14.8m in 10 minutes, 14.8m in 15 minutes and 14.7m in 20 minutes.	Water added details		Casing details		Level (m OD) 108.93	Compiled by KD	Revision 0
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	Co-ordinates -	Checked by SD	BH08
			220 170	6.00 16.00			

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
	Soft to firm grey sandy CLAY. (MADE GROUND)	15.20	93.73									15.00		ES
		16.50	92.43									16.00		ES
	BOREHOLE TERMINATED AT 16.50m													

Notes Inspection pit excavated to 1.2m depth.	Chiselling details		Drilling details		Title		Date(s)	
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Borehole record		24/07/2020	
			220 170	14.00 16.50	Method Cable tool percussion	Logged by RT	Sheet number Sheet 2 of 2	
Groundwater observations Groundwater strike at 15.2m depth, filling borehole to 15m in 5 minutes, 14.8m in 10 minutes, 14.8m in 15 minutes and 14.7m in 20 minutes.	Water added details		Casing details		Level (m OD)		Compiled by	
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	108.93		KD	
			220 170	6.00 16.00	Co-ordinates -	Checked by SD	Revision 0	
							BH08	

INSTALL	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE

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Notes Inspection pit excavated to 1.2m depth.	Chiselling details		Drilling details		Title Borehole record		Date(s) 08/07/2020 - 10/07/2020	
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)				
	2.10 - 2.30	01:00	220	13.00	Method		Logged by	Sheet number
	10.80 - 11.10	01:00	170	15.00	Cable tool percussion		RT	Sheet 1 of 2
Groundwater observations Groundwater strike at 13.1m depth, filling borehole to 11.2m in 5 minutes, 10.7m in 10 minutes, 9.2m in 15 minutes and 9.1m in 20 minutes. Sealed off with casing at 13.1m.	Water added details		Casing details		Level (m OD)		Compiled by	Revision
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	108.55		KD	0
			220 170	10.50 14.50	Co-ordinates -		Checked by SD	BH09

INSTALL + - + -	STRATA				WATER STRIKES	SPT TESTING				OTHER IN SITU TESTING		SAMPLING		
	DESCRIPTION	DEPTH (m)	REDUCED LVL (m OD)	LEGEND		TYPE / DEPTH (m)	RESULT	CASING DEPTH (m)	WATER LEVEL (m)	TYPE / DEPTH (m)	RESULT	FROM (m)	TO (m)	TYPE
+ - + -	(WHITBY MUDSTONE FORMATION)	15.00	93.55	— —							15.00		D	
	BOREHOLE TERMINATED AT 15.00m													

Notes Inspection pit excavated to 1.2m depth.	Chiselling details		Drilling details		Title		Date(s)
	Depth (m)	Duration (hh:mm)	Diameter	Base depth (m)	Borehole record		08/07/2020 - 10/07/2020
			220 170	13.00 15.00	Method Cable tool percussion	Logged by RT	Sheet number Sheet 2 of 2
Groundwater observations Groundwater strike at 13.1m depth, filling borehole to 11.2m in 5 minutes, 10.7m in 10 minutes, 9.2m in 15 minutes and 9.1m in 20 minutes. Sealed off with casing at 13.1m.	Water added details		Casing details		Level (m OD)		Compiled by
	Depth (m)	Water Added (l)	Diameter	Base depth (m)	108.55		KD
			220 170	10.50 14.50	Co-ordinates -	Checked by SD	BH09

