Consulting Civil Engineers

Foul and Surface Water Drainage Report

Land Adjacent to the Meadow Little Park Farm, Hurstpierpoint

Planning Ref: DM/25/1549

For

Heathland Hurstpierpoint Ltd

Rev P1

Reference C3917

Date 24th October 2025

Revision	Date of Issue	Comments	Prepared By	Checked By
P-	24/10/2025	Initial Issue	MR	CS
P1	10/12/2025	Updated to new site plan	KCK	CS

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Contents

1 Introduction

1.1.1 CGS Civils Ltd has been appointed to undertake a drainage strategy report for a proposed development at Land Adjacent to the Meadow Little Park Farm, Hurstpierpoint

1.1.2 The purpose of this drainage strategy is to demonstrate how the development area can be satisfactorily drained without increasing flood risk onsite and elsewhere in order to clear Condition 1. The condition is in place on Decision Notice from **12th September 2025**, with the planning reference: **DM/25/1549.** The condition requires the Surface Water and Foul Sewage Assessment.

1.1.3 The existing site is currently occupied by storage buildings. The proposed development comprises the demolition of these buildings and the construction of a single new residential dwelling. The proposed development is located as OS Grid Reference **TQ 28492 16665** and has the post code **BN6 9UZ.**

1.1.4 The proposed site plan can be found in **Appendix A.**

Fig 1. Site Location

2 Executive Summary:

2.1.1 Surface water is proposed to be discharged into the existing ditch located to the north. The proposed storm water runoff will be attenuated on-site within a detention basin before being discharged into the ditch at a restricted flow rate of 1.5 l/s. The proposed surface water network has been designed to accommodate the critical 1 in 100-year storm event, including an additional 45% allowance for climate change.

2.1.2 The foul water will discharge to the existing combined manhole located on the neighbouring site within client's ownership. This connection is subject to Southern Water approval under a Section 106 agreement.

3 Site Geology

3.1 British Geological Survey information

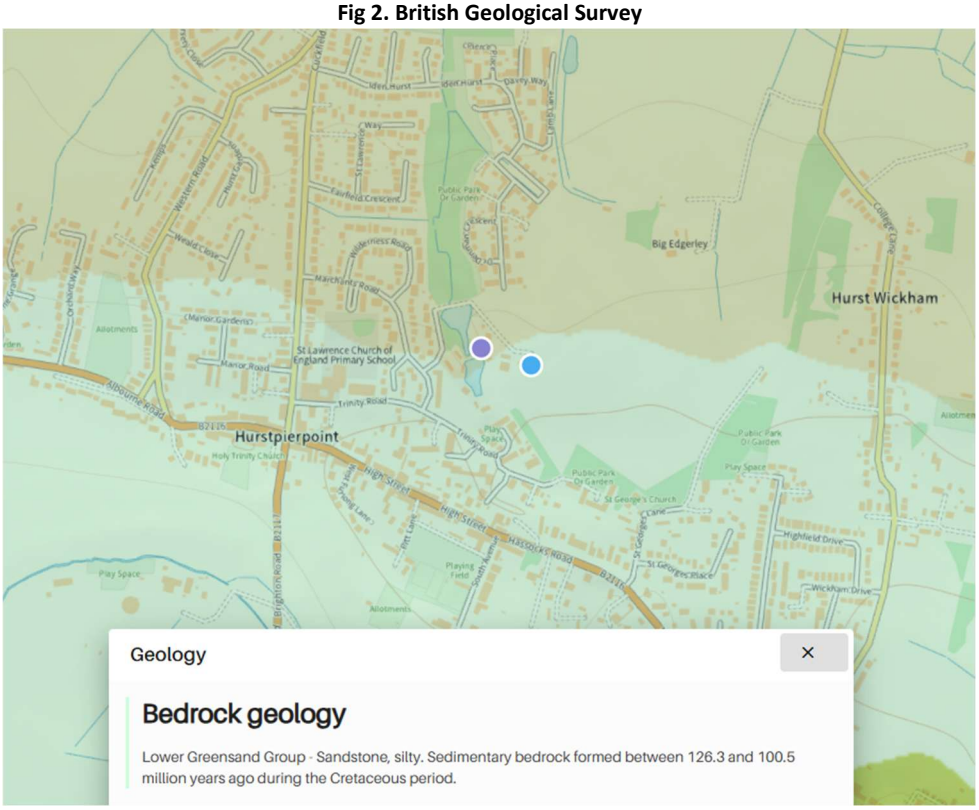
3.1.1 The British Geological Survey confirms the bedrock geology to be made up Lower Greensand Group- Sandstone, silty. At the time of writing the British Geological Survey website does not have any recorded information of the Superficial deposits on site.

3.1.2 The British Geological survey also holds records of historical boreholes near the site which give some insight into the ground geology.

- Borehole **TQ21NE18** (Located approx. 1200m South-East of the site) – Ground geology (Fine clayey sand)

3.1.3 The British Historical Borehole Log can be found in **Appendix B.**

Fig 2. British Geological Survey



Snippet from BGS Website showing Bedrock geology http://mapapps.bgs.ac.uk/geologyofbritain/home.html?

Fig 3. British Geological Survey

Snippet from BGS Website showing Historical Borehole Logs location

3.2 Geological Assessment

3.2.1 No intrusive ground investigation has been undertaken on the proposed development site. However, a subsoil investigation was carried out on the neighbouring site, which is also within the client's ownership.

3.2.2 The report undertaken by R.Caar Geotechnical Services (ref: 3903/21) confirmed that three trial pits were excavated and inspected on 4th October 2021. The soils encountered were summarised as follows: silty clay and sandy clay near the surface, underlain by a stiff, mottled silty sandy clay below approximately 0.7 m bgl.

3.2.3 The investigation recorded groundwater at an approximate depth of 2.0 mbgl.

3.2.4 The Ground Investigation report can be found in **Appendix C.**

4 Existing Drainage

4.1.1 The adjacent site, under the same client ownership, currently discharges surface water runoff to the existing ditch situated to the north through a combined manhole. The manhole functions as a combined outfall for both surface and foul flows due to the absence of a public foul sewer within the immediate vicinity of the site.

5 Proposed Drainage Strategy

5.1 SuDS Hierarchy

5.1.1 All options for the destination of run-off generated on site have been assessed in line with the SuDS hierarchy as set out in Building Regulations Part H document and DEFRA's Draft National Standards for SuDS.

Table 1. SuDS Hierarchy

Discharge Destination	
Rainwater Harvesting	**Yes**- Proposed rainwater harvesting tank to allow reuse of roof water for non-potable purposes and to reduce surface water runoff.
Discharge to Ground	**No**- No surface water infiltration proposed due to high groundwater levels and poor infiltration potential.
Discharge to Watercourse	**Yes**- Storm water runoff is to be discharged into the existing ditch located to the north of the site, with at restricted flow discharge rate of 1.5 l/s
Discharge to Surface Water Sewer	N/A
Discharge to Other Sewer	N/A

5.2 Proposed Hydraulic Calculation Specifications:

Table 2. SuDS Hierarchy

Hydraulic Calculations Settings:	
Rainfall Methodology	**FEH-22**
Volumetric Run-off Coefficient Cv	**1**
CV Winter and Summer	**1**
Additional Storage (m^3 / ha)	**0.0**
Maximum Rainfall (mm/hr)	**75**
Flow Control	**0.536m Head @ 1.5l/s discharge**
Detention Basin	Base Coefficient (m/hr): **0.00000**
	Side Coefficient (m/hr): **0.00000**
	Factor of Safety: **2**
	Porosity: **100%**
	Time to Half Empty (mins): **79**

5.3 Surface Water Drainage

5.3.1 Based on information obtained from the British Geological Survey, the existing drainage layout on the neighbouring site approved under planning application DM/22/1571, and the ground investigation report prepared for the client in October 2021, discharge to ground via infiltration is considered not viable. Therefore, it is proposed that all surface water runoff be discharged to the existing ditch located to the north, which forms the existing storm water drainage adjacent to the site.

5.3.2 Surface water runoff is to be discharged into the existing ditch at a restricted rate of 1.5 l/s, reflecting the greenfield runoff rate for the site corresponding to the 1 in 1-year event, as calculated using the FEH Statistical Method (2025).

Table 3. Greenfield Runoff Calculations FEH Statistical (2025)

Storm period	Greenfield runoff rate (l/s)	Proposed Discharge Rate (l/s)	Difference (l/s)
Q_{BAR}	1.7	1.5	+ 0.2
1	1.5	0.6	+ 0.9
2	1.5	0.6	+ 0.9
30	4.0	1.1	+ 2.9
100	5.5	**1.5**	+ 4.0

5.3.3 All roof runoff will be collected into a positive drainage network before discharge to the existing ditch. The network incorporates a detention basin, designed to accommodate the 1 in 100-year storm event, including a 45% allowance for climate change. The detention basin will be lined with an impermeable geomembrane to prevent groundwater ingress.

5.3.4 All hard-paved areas are to be constructed using a self-draining, permeable finish. The final running surface will be confirmed at the detailed design stage.

5.3.5 The rainwater harvesting tank is proposed to collect and reuse roof runoff for non-potable purposes, reducing overall runoff and promoting sustainable water use.

5.3.6 The proposed storm water connection is subject to Ordinary Watercourse Consent (OWC) approval. The connection to the ditch is currently routed through a series of trees. If it is determined that the proposed connection falls within the Tree Protection Area (TPA), the Arboriculturist will advise on necessary measures, and the drainage strategy will be revised accordingly. This may involve relocating the connection point along the ditch or alternatively connecting into the existing combined water manhole located within the client's ownership.

5.3.7 Proposed Drainage Strategy & Exceedance Flow Routes, Greenfield Runoff and Hydraulic calculations have been carried out which can be found at **Appendix D.**

5.4 Water Quality

5.4.1 A key requirement of any SuDS system is that it protects the receiving water body from the risk of pollution.

5.4.2 Frequent and short duration rainfall events are those that are most loaded with potential contaminants (silts, fines, heavy metals, and various organic and inorganic contaminants) Therefore the first 5-10mm of rainfall should be adequately treated with SuDS.

5.4.3 The new SuDS Manual (Ciria C753, November 2015) introduces slightly different approach compared to the previous version for the water quality management of surface water. The Manual describes risks posed by the surface water runoff to the receiving environment as a function of:

- The pollution hazard at a particular site (i.e., the pollution source)
- The effectiveness of SuDS treatment components in reducing levels of pollutants to environmentally acceptable levels
- The sensitivity of the receiving environment

5.4.4 The recommended approaches for water quality risk management are given in the SuDS Manual Table 26.1.

Table 26.1 from SuDS manual. Approaches to Water Quality Risk Management

Table 26.1 Approaches to Water Quality Risk Management			
Design method	**Hazard Characterisation**	**Risk Reduction**	
		For Surface Water	**For Groundwater**
Simple Index Approach	Simple pollution hazard indices based on land use (Table 26.2)	Simple SuDS hazard mitigation indices (Table 26.3)	Simple SuDS hazard mitigation indices (Table 26.4)
Risk Screening	Factors characterising traffic density and extent of infiltration likely to occur (Table 26.5)	N/A	Factors characterising unsaturated soil depth and type, and predominant flow type through the soils (Table 26.5)
Detailed Risk Assessment	Site specific information used to define likely pollutants and their significance	More detailed, component specific performance information used to demonstrate that the proposed SuDS components reduce the hazard to acceptable levels	
Process-based treatment modelling	Time series rainfall used with generic pollution characteristics to determine statistical distributions of likely concentrations and loadings in the runoff	Models that represent the treatment processes in the proposed SuDS components give estimates of reductions in even mean discharge concentrations and total annual load reductions delivered by the system	

5.4.5 As per Table 26.1 Simple Index approach will be used as a design method for this site.

5.4.6 Table 26.2 will provide hazard classification of different land uses. The land uses for the surface water drainage for this site are.

- Residential Roofs
- Private driveway **(location to be confirmed)**

5.4.7 To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index for each contaminant type that equals or exceeds the pollution hazard index for each contaminant type. Therefore, the following must be achieved for the surface running off the site.

Total SuDS mitigation index >=pollution hazard index

5.4.8 Pollution Hazard Indices are given for different land uses in Table 26.2 of the SuDS manual;

Table 26.2 from SuDS manual. Pollution Hazard Indices for Different Land Use Classifications

Table 26.2 Pollution hazard indices for different land use classifications				
Land Use	**Pollution Hazard Level**	**Total Suspended solids (TSS)**	**Metals**	**Hydro-Carbons**
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (Typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g., cul-de-sacs, homezones and general access roads) and non-residential car parking with infrequent change (e.g., schools, offices) i.e., < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g., hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g., haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

5.4.9 From Table 26.2 the following information is tabulated in Table 1

Table 1: **Pollution hazard index and destination of runoff for the proposed site**

Table 3: Pollution Hazard Index and Destination of runoff for the proposed Site					
Land Use	**Destination of Runoff**	**Pollution Hazard Level**	**Total Suspended Solids**	**Metals**	**Hydrocarbons**
Residential Roof	Surface Water	Very Low	0.2	0.2	0.05
Individual driveways, residential car parks and low traffic roads	Ground water	Low	0.5	0.4	0.4

5.4.10 The SuDS mitigation index will be obtained from Table 26.4 (for groundwater) of the SuDS manual.

Table 26.3 from SuDS manual. Indicative SuDS Mitigation Indices for discharges to ground waters.

Table 26.4 Indicative SuDS mitigation indices for discharges to groundwater			
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates	**TSS**	**Metals**	**Hydrocarbons**
A layer of dense vegetation underlain by a soil with good containment attenuation potential of at least 300mm in depth	0.6	0.5	0.6
A soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, i.e., graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth.	0.4	0.4	0.4
Constructed permeable pavement (where a suitable filtration later is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

Table 26.3 from SuDS manual. Indicative SuDS Mitigation Indices for discharges to surface waters.

Table 26.4 Indicative SuDS mitigation indices for discharges to surface waters			
	Mitigation Indices		
Type of SuDS Components	**TSS**	**Metals**	**Hydrocarbons**
Filter Strip	0.4	0.4	0.5
Filter Drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention System	0.8	0.8	0.8
Permeable Pavement	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

5.4.11 SuDS mitigation indices are tabulated in Table 5 as follows:

Table 5: SuDS mitigation index

Table 4 Mitigation Indices						
Runoff Source	**Destination of Runoff**	**Mitigation Index Source**	**Type of SuDS Component**	**Total Suspended Solids (TSS)**	**Metals**	**Hydrocarbons**
Residential Rood	Surface Water	Table 26.4 (for surface waters)	Detention Basin	0.5	0.5	0.6
Individual driveways, residential car parks and low traffic roads (location to be confirmed)	Ground water	Table 26.3 (for ground waters)	Permeable Pavement	0.7	0.6	0.7

5.4.12 The above analysis demonstrates that the SuDS devices within the design will mitigate any pollution present within the surface water system.

5.5 Foul water drainage

5.5.1 The proposed foul water will discharge into the existing combined manhole located on the neighbouring site, which is within the client's ownership. Prior to connection, the foul water shall be treated onsite via a treatment plant. This is required because the discharge from the combined manhole ultimately outfalls to the existing watercourse, in accordance with the approved drainage arrangements on the neighbouring site under planning application reference DM/22/1571.

5.5.2 The proposed connection subject to Southern Water approval under S106 application.

5.6 Construction Phase Drainage

5.6.1 It is an offence to cause or knowingly permit the entry of any polluting, poisonous or noxious material in the water environment. If the pollution is serious enough to lower the ecological status of the water body as set out in terms by the Water Framework Directive (2000/60/EC) than prosecution may occur.

5.6.2 Remediation of any damage caused will not require the polluter to be prosecuted first. If the water pollution is serious enough to be classed an environmental damage, the damage will require to be remediated such that the area is returned to the condition it would have been in if the damage had not occurred.

5.6.3 If any pollution has not been reported or the polluter has not taken actions to prevent any further damage; they would then be causing an offence. Third parties (e.g., Private water supply users, landowners, recreation users and the public) who may be affected by possible damage may also report the risk of any environmental damage to the enforcing authority.

5.6.4 The principles of SuDS (Sustainable Drainage Systems) shall be applied to all components of design and construction regarding surface water management. Any design or site works that may impact on the site drainage or the water quality shall:

- Soakaway where soils allow
- Consider and manage erosion
- Remove pollutants in surface water
- Retain any silts on site and prevent silts from discharging to watercourses or drains
- Keep runoff rates at existing greenfield runoff
- Prevent accidental spillages reaching watercourse

5.6.5 As infiltration is not feasible due to stiff clay soils and high groundwater level potential, temporary surface water drainage during the construction phase will be managed by a system of land drains with runoff pumped into the existing ditch. The discharge will be controlled to prevent flooding and siltation, with appropriate pollution control measures (including silt traps and settlement tanks) installed in accordance with the CIRIA SuDS Manual (C753) and CIRIA C532 guidance. The discharge will consist of clean, treated water and will be subject to the Environment Agency's water discharge permitting regime.

5.6.6 Pollution will be controlled via the use of catchpit manholes and geotextiles.

5.6.7 Any potential hazardous substances will be within a controlled compound with a separate drainage system that will contain a penstock valve / containment kit in the event of a spillage.

6 Summary and Conclusions

6.1.1 CGS Civils has been instructed to produce a Drainage statement under National Planning Policy Framework (NPPF) to support the Planning Application for a construction of single residential dwelling.

6.1.2 The Surface Water will discharge into the existing ditch to the north with a restricted flow discharge rate of 1.5l/s, reflecting the greenfield runoff rate for the site corresponding to the 1 in 1-year event, as calculated using the FEH Statistical Method (2025). The network incorporates a detention basin, designed to accommodate the 1 in 100-year storm event, including a 45% allowance for climate change.

6.1.3 The Foul water will discharge into the existing combined manhole located on neighbouring site. The proposed connection is to be agreed under S106 application with Southern Water.

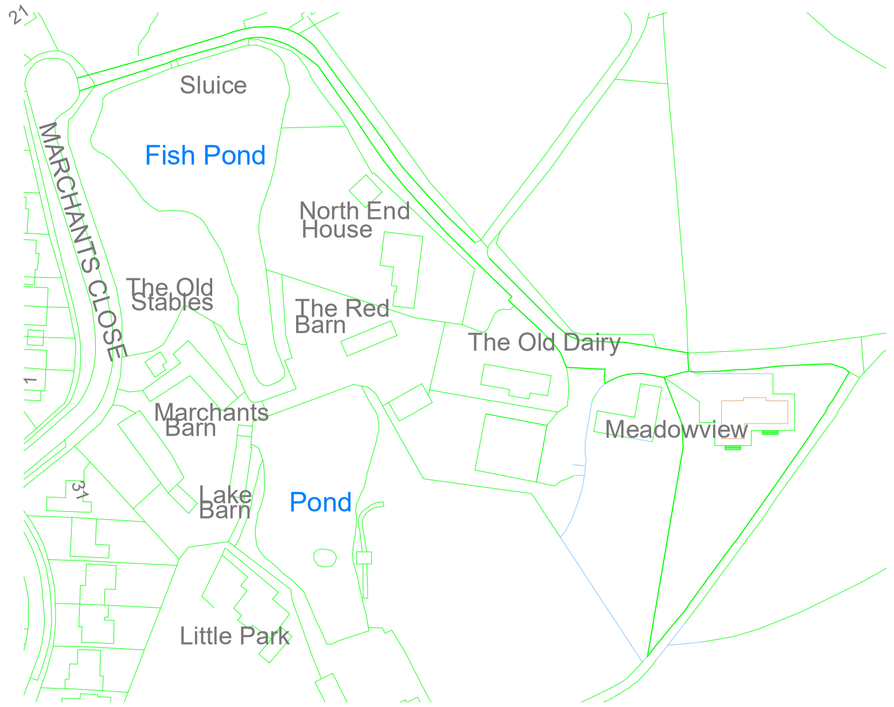
6.1.4 The report has demonstrated that the proposed drainage measures ensure that suitable means of surface water and foul drainage can be achieved for the proposed development.

6.1.5 A maintenance schedule has been written up for the drainage network including the SuDS features and can be found within **Appendix E.**

7 Appendices

7.1 Appendix A – Site Plan

Site Plan 1:1250



Site Plan 1:500

Revisions

0.5 0 0.5 1 1.5 2 2.5
SCALE 50 m
1:

1 0 1 2 3 4 5
SCALE 100 m
1:

5 0 5 10 15 20 25
SCALE 500 m
1:

10 0 10 20 30 40 50
SCALE 1250 m
1:

Materials

Drawing Number	2025/208	Sheet	4 of 4
Size	A1	Scale	1:50, 1:100, 1:500, 1:1250

Project

Proposed details
November 2025

Job Title

Proposed dwelling
Little Park Farm
Hurstpierpoint
BN6 9UZ

Do Not scale from this drawing except for planning as photocopies will be subject to distortion
Drawings to be read in conjunction with all other Designers and structural engineers contract drawings and specifications: Any discrepancies must be brought to the attention of the Designer immediately.
The contractor must verify all dimensions by site measurement before ordering materials or manufacturing components
Substitute materials and products to those named will be acceptable if proven to be of equal or higher performance and not in conflict with other elements

M.J.Humphrey
Ltd

R:\Desktop\Drawings\Little Park Farm New House\Proposed\SVG\LittleParkFarm-L0025-403528.jpg

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7.2 Appendix B – Borehole Log

Date 1958

CONFIDENTIAL

BOREHOLE No. 9

TQ 21 NE/18

Land at HASSOCKS SAND PIT

Water Struck at _____ metres. Rest Water Level _____ metres. after _____ hours.

Ordnance Datum Level _____

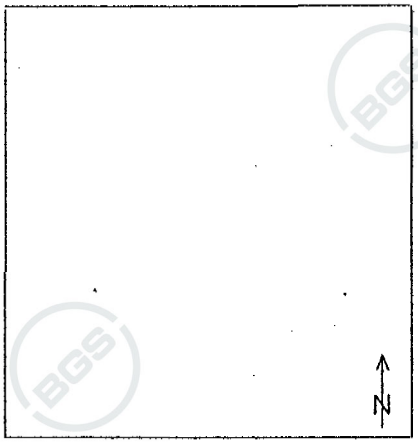
Description of Material	From (metres)	To (metres)	Depth of Seam metres	Total Depth metres	Bore Hole Section
Topsoil	0.0	0.6	0.6		
Fine clayey sand					

REMARKS:

Samples taken at

(1) _____ metres (2) _____ metres (3) _____ metres

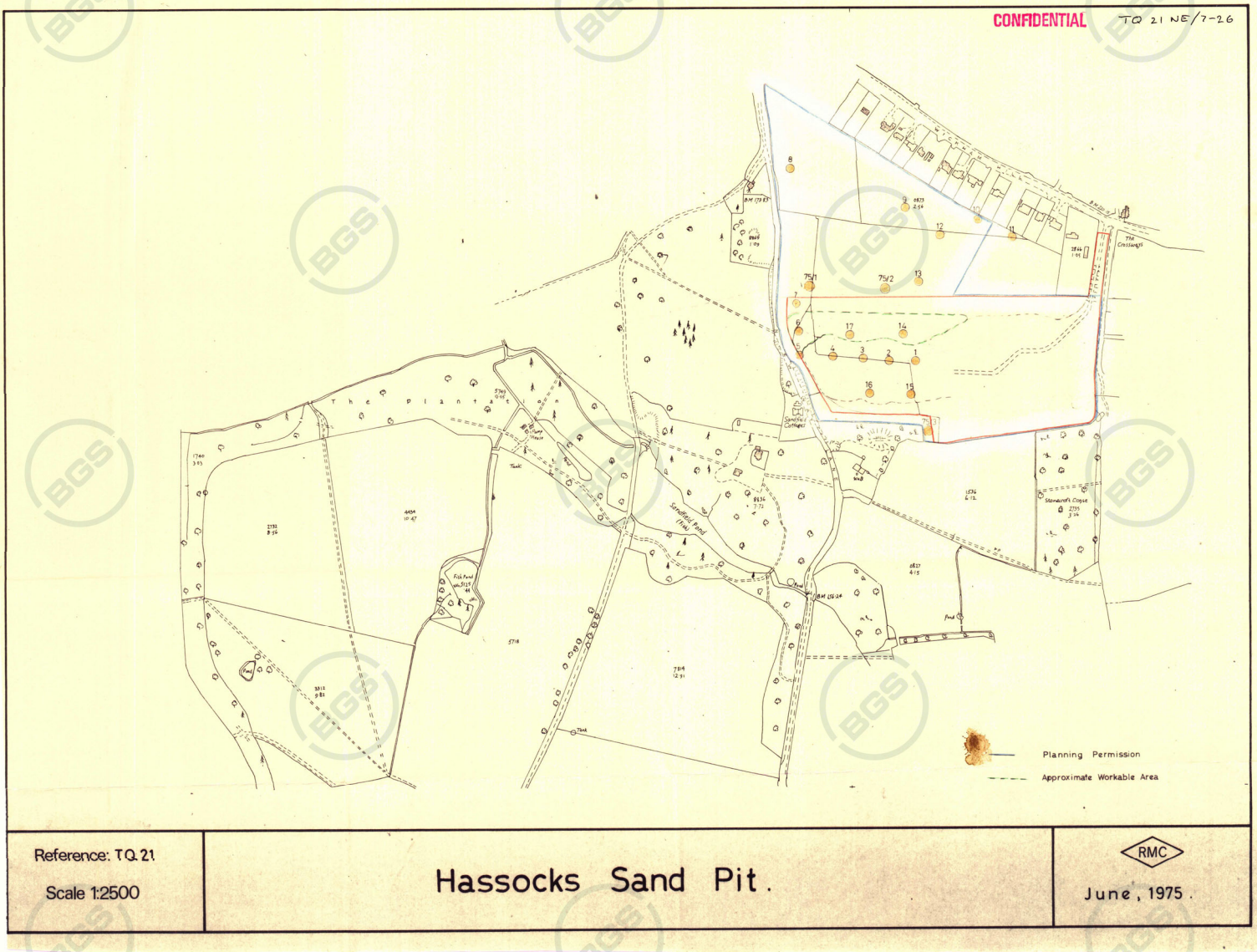
(4) _____ metres (5) _____ metres (6) _____ metres



Sketch Plan

BGS ID: 584226 : BGS Reference: TQ21NE18
British National Grid (27700) : 529070,115730

CONFIDENTIAL TQ 21 NE/7-26



Reference: TQ 21

Scale 1:2500

Hassocks Sand Pit.

RMC

June, 1975.

7.3 Appendix C – Ground Investigation Report

R. CARR GEOTECHNICAL SERVICES

Ref: 3903/21

PROPOSED REDEVELOPMENT AT LITTLE PARK FARM, MARCHANTS CLOSE, HURSTPIERPOINT, WEST SUSSEX BN6 9UZ.

PHASE 2 REPORT ON SUBSOIL INVESTIGATIONS

October 2021

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Contents

Little Park Farm, Marchants Close, Hurstpierpoint, West Sussex BN6 9UZ.

1. Introduction

1.1 This report has been prepared on behalf of Heathland Hurstpierpoint Ltd, prospective developers of the site located at Little Park Farm, Hurstpierpoint.

1.2 The proposed development comprises the construction of three detached dwellings and the conversion of an existing dairy building to residential use.

1.3 This report should be reviewed in conjunction with the Phase 1 Desk Study and Preliminary Risk Assessment previously undertaken for the site by R. Carr Geotechnical Services (report reference 3592/21 dated June 2018). Based upon the available information the site would appear to have supported an orchard which had been removed by 1976. The construction and removal of agricultural buildings had periodically occurred on the site. An inspection of the site undertaken during 2018 revealed it to be in a generally clean condition, a low to moderate risk being considered applicable to human health, plant life and groundwater from the following sources of potential contamination:

- Localised petroleum hydrocarbon contamination (TPH) resulting from leakages and spillages of fuel and lubricants from farm machinery and vehicles
- Residual lead arsenate and copper sulphate from pesticides historically used in orchards
- Metals, polynuclear aromatic hydrocarbons (PAH) and TPH possibly present within existing surfacing
- Asbestos possibly present within the fabric of the existing or demolished buildings

1.4 A low risk from off-site sources of potential contamination and migration of ground gases was identified to the site.

1.5 Contained within this report are the results of a Phase 2 intrusive investigation undertaken at the site, together with a revised risk assessment. This information has

been derived from trial pit investigations and subsequent laboratory testing of representative soil samples obtained from the site. The report has been compiled in general compliance with the following guidelines:

- Model Procedures for the Management of Land Contamination. Environment Agency Contaminated Land Report 11 (CLR 11)
- GPLC1 - Guiding Principles for Land Contamination. Environment Agency 2010
- National Planning Policy Framework (NPPF) (2012)
- NHBC Part 4 Foundations *4.1 Land Quality: Managing Ground Conditions*

2. Topography

2.1 The site comprises a roughly triangular parcel of land situated to the east of Marchants Close at OS Land Ranger map reference TQ 284 166. At this point ground level is sloping gently downhill from south to north.

2.2 The site is enclosed by deciduous trees consisting mainly of moderate water demand Ash and Sycamores. Little change had occurred to the site since the time of the original inspection in 2018.

3. Geology

3.1 Reference to the local Geological Survey sheet (no. 318/333: Brighton & Worthing) has indicated that the site is underlain by the undivided Lower Greensand formation with exposures of the underlying Weald Clay denoted in close proximity to the north.

3.2 The Lower Greensand typically comprises interbedded fine to medium grained sandstones, glauconitic mudstone and calcareous sandstones with seams of Fullers earth.

3.3 The Weald Clay consists of dark grey shales and mudstones with subordinate sandstones, shelly limestones and clay ironstones, which weather in their upper regions to form mottled yellow and brown clays.

4. Hydrology and Hydrogeology

4.1 A large ornamental pond is located adjacent to the west boundary of the site.

4.2 The Lower Greensand is classified as a Major Aquifer. A Major Aquifer is defined by the Environment Agency as a "highly permeable formation with known or possible presence of significant fracturing". These tend to be highly productive and capable of supporting public supply and other abstractions. Soil Classification: Soils of High Leaching Potential (U).

4.3 The Weald Clay is classified as a Non Aquifer.

5. Subsoil Investigations

5.1 Three trial pits excavated by the developer with a 360° tracked excavator were inspected on 4th October 2021, the locations of the pits being denoted on the accompanying site plan (TP1-TP3). The pits were positioned so as to target areas of proposed garden and to obtain an even coverage of the site. Disturbed samples of soil were retained in plastic containers and glass jars for contamination analysis and geotechnical tests at UKAS Accredited laboratories. The samples were transported to the respective laboratories immediately after completion of the site work.

5.2 Details of the soils encountered by the intrusive investigation are provided within strata logs contained in Appendix A, but can be conveniently summarised as follows

Depth	Stratum
Ground level – 0.35m/0.4m	FILL – topsoil over silty clay with scattered fine to coarse chalk, flint and fine brick gravel
0.3m – 0.7m (TP3 only)	HEAD DEPOSITS – firm, silty slightly sandy CLAY with occasional fine to coarse subangular flint gravel
0.35m/0.7m – 2m+	LOWER GREENSAND – stiff, mottled silty slightly sandy CLAY

5.3 The trial pits had been excavated two days prior to the inspection, during which time heavy rain had fallen. Each pit contained water in its base, most of which was pumped out prior to the inspection of each excavation. No evidence of significant groundwater ingress was observed within the trial pits during the inspection and the sides of the pits had remained stable during the time that had elapsed since their excavation.

6. Laboratory Testing

Geotechnical Tests

6.1 Atterberg Classification tests carried out on five samples of soil obtained from the trial pits at depths between 1m and 2m have categorised the material as clay of high plasticity (CH). Such soils are susceptible to shrinkage and swelling following changes in moisture content.

6.2 Chemical testing undertaken on three representative soil samples recovered from the excavations at depths between 1m and 2m has determined soil pH level of 6.8 to 7.5, with water soluble sulphate of 0.03 to 0.13 g/L (Class DS-1).

Contamination Tests

6.3 Soil samples obtained from the trial pits at depths of 0.25m and 0.5m have been analysed for a suite of common contaminants including speciated PAH, petroleum hydrocarbon fractions (TPH/CWG) and presence of asbestos fibres. The results of the tests are provided in Appendix B, having been compared with the following soil screening criteria for residential development:

- Contaminated Land Exposure Assessment model (CLEA) 2015
- LQM/CIEH S4ULs for Human Health Risk Assessment 2015
- SP1010 Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document 2014

6.4 Concentrations of substances present in the samples were well within the utilised soil screening criteria. Quantities of TPH and BTEX were below laboratory detection levels and no traces of asbestos were detected in the samples.

7. Discussion/Recommendations

7.1 The investigation has confirmed the existence of the Lower Greensand beneath the site, overlain by a 0.35m to 0.4m thick layer of made ground (Fill). A 0.4m thick layer of Head Deposits was found to overlie the Lower Greensand at the location of TP3.

7.2 No significant groundwater table was evident within 2m of the site surface, though the hydrogeology of the site may be subject to seasonal variations and groundwater levels could rise during wetter, winter months.

Foundations

7.3 An acceptable bearing pressure of 120 kN/m² is generally applicable within the Lower Greensand at a depth of 1m, increasing to 150 kN/m² at 2m. Due to the presence of trees around the site reference should however be made to NHBC publication 4.2 with regard to the depth and design of foundations. The precise depth of the foundations will therefore be dictated by the proximity of trees to the proposed dwelling. NHBC Classification: Medium Volume Change Potential (i.e. plasticity index less than 40%).

7.4 The results of the sulphate determinations have categorised the subsoil as Class DS-1, therefore special precautions would not be necessary within sub-surface concrete placed on the site (see BS 8500-1:2015+A2:2019).

Revised Risk Assessment

7.5 Contaminant concentrations detected within the soil samples are well within currently available soil screening criteria. No pollutant linkages have been identified, therefore the site is considered to pose a low risk to human health, groundwater and plant life.

7.6 The risk posed by the development to the adjacent surface water feature could be reduced by appropriate mitigation in order to prevent leakages and spillages.

7.7 In the absence of TPH and BTEX contamination and low PAH levels, a low risk to

subterranean plastic services is also considered applicable. Polyethylene supply pipes could therefore be utilised within the development.

7.8 The following ground gas risk assessment has been undertaken in compliance with the methodology proposed by CL:AIRE research bulletin RB17 (2012):

1. No credible sources of gas migration were identified to the site by the desk study.
2. No radon protection measures are required within the development.
3. The average depth of made ground beneath the site does not exceed 0.4m.
4. The Fill material comprises re-worked natural soils which do not produce methane and can only produce carbon dioxide.
5. The total organic carbon content of the Fill material is less than 2.5%.
6. No evidence of TPH which could produce vapours was detected within the soil samples.

It is therefore considered that the risk to the site posed by emissions of ground gas is low.

Remediation Method Statement

7.9 As excessive contamination has not been discovered beneath the site no remediation is considered necessary other than the removal and appropriate disposal of demolition materials and site surfacing. **Haulage transfer notes should be retained as evidence that material removed from the site has been disposed of at an appropriately licensed waste facility and for inclusion within a Closure Report for the site.**

7.10 Any topsoil imported onto the site for use in garden areas should be tested in order to ensure that it is free from contamination and suitable for its proposed use.

7.11 If asbestos-containing material is discovered within the fabric of the existing buildings it should be dismantled by an experienced contractor and removed from the site to an appropriately licensed depository.

7.12 Potable water supply pipes should be laid in trenches and surrounded with clean material. The advice of the local water authority should be sought in the event that

doubt arises over the suitability of materials.

7.13 A low risk from ground gases and contaminant vapours has been identified to the site therefore gas protection measures are not considered necessary within the design of the development.

7.14 Site workers should be provided with appropriate protective clothing and washing facilities. Dust emissions should be minimised as far as possible in order to safeguard both site workers and the occupants of adjacent houses.

7.15 A sensitive receptor in the form of a large pond is located on adjacent land to the west of the site. It is therefore recommended that in order to prevent the escape and subsequent migration of pollutants into the nearby surface water feature fuel and/or lubricants utilised by contractors' plant should be stored in a secure, preferably bunded area of the site remote from the waterbody.

7.16 In the event that contamination not detected by the intrusive investigations is encountered during the course of the development, the nature of the contamination must be adequately assessed and dealt with in an appropriate manner. Evidence of contamination may include discoloured or malodorous soil and/or the presence of ash, clinker or asbestos fragments.

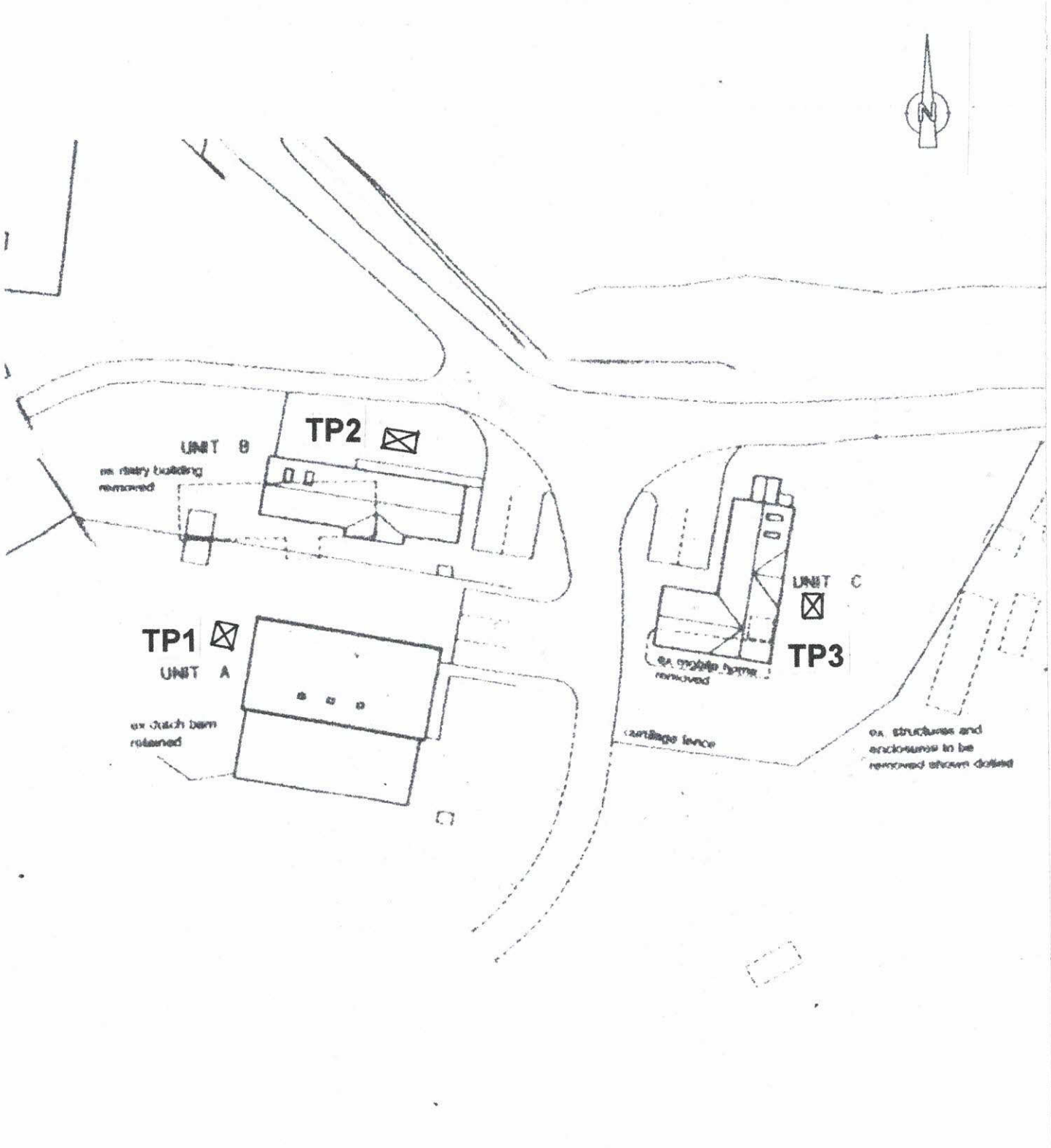
7.17 The findings and recommendations contained within this report should be made available to the Contaminated Land Officer of the Local Planning Authority prior to the commencement of the development.

7.18 This report has been prepared from information obtained at representative locations of the site. Although significant variations in ground conditions are considered unlikely, no responsibility can be accepted for any such variations that may exist beneath the site in hitherto uninvestigated areas.

R. Carr BA (Hons) FGS
October 2021

Appendix A

Subsoil Investigations



Little Park Farm, Marchants Close, Hurstpierpoint.

Plan showing locations of trial pits.

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: **LITTLE PARK FARM, HURSTPIERPOINT** No. TP1

Method of excavation: **360^0 Excavator** Date: 04.10.21

SAMPLE	DEPTH m.	G.L.	DESCRIPTION OF SOIL
	0.10		Topsoil with abundant roots up to 20mm diameter
●	0.25		Grey-brown silty clay with scattered fine to coarse chalk gravel, scarce fine brick gravel and roots up to 5mm diameter
	0.40		(FILL)
●	0.50	0.50	Stiff orange-mottled buff, silty slightly sandy CLAY with abundant roots up to 5mm present to around 0.9mm and fine rootlets evident to 1.3m
●	1.00	1.00	(? LOWER GREENSAND)
●	1.50	1.50	
●	2.00	2.00 ▼	
		End	50mm water present in base of pit
	2.50		● = Disturbed sample
	3.00		
	3.50		
	4.00		
	4.50		

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STRATA LOG

Job: **LITTLE PARK FARM, HURSTPIERPOINT** No. TP2

Method of excavation: **360^0 Excavator** Date: 04.10.21

SAMPLE	DEPTH m.	G.L.	DESCRIPTION OF SOIL
	0.15		Topsoil with abundant roots up to 20mm diameter
●	0.25		Grey-brown silty clay with occasional fine to coarse flint gravel, scarce fine brick gravel and roots up to 5mm diameter (FILL)
	0.35		
●	0.50	0.50	Stiff orange-mottled buff, silty slightly sandy CLAY with abundant roots up to 15mm diameter present to 0.7m, scarce fine rootlets evident to 1.1m
●	1.00	1.00	(? LOWER GREENSAND)
●	1.50	1.50	
●	2.00	2.00	
		2.10	50mm water present in base of pit
		End	● = Disturbed sample
		2.50	
		3.00	
		3.50	
		4.00	
		4.50	

R. CARR GEOTECHNICAL SERVICES

STRATA LOG

Job: **LITTLE PARK FARM, HURSTPIERPOINT** No. TP3

Method of excavation: **360^0 Excavator** Date: 04.10.21

SAMPLE	DEPTH m.		G.L.	DESCRIPTION OF SOIL
		0.14		Compact granular surfacing
●	0.25			Grey-brown silty clay with scattered fine to coarse flint gravel and abundant roots up to 5mm diameter (FILL)
		0.30		
●	0.50	0.50		Firm brown silty slightly sandy CLAY with occasional fine to coarse subangular flint gravel (HEAD DEPOSITS)
		0.70		
●	1.00	1.00		Stiff orange-mottled buff, silty slightly sandy CLAY with occasional fine rootlets evident to 1.8m
●	1.50	1.50		(? LOWER GREENSAND)
●	2.00	2.00		
			End	50mm water present in base of pit
		2.50		● = Disturbed sample
		3.00		
		3.50		
		4.00		
		4.50		

Appendix B

Laboratory Test Results

Peter Baxter Associates Laboratories
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UKAS TESTING 4295

Summary of Classification Test Results

Project No. 1370/54	Project Name: Little Park Farm, Hurstpierpoint
Client Ref N/A	Client: Ron Carr Geotechnical Services
	Sampled by: Client
	Date received: 05/10/2021
	Date Tested: 05/10/2021

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Density bulk Mg/m³	Density dry Mg/m³	w %	Pass 425µm %	LL %	PL %	PI %	Particle density Mg/m³	Remarks
TP1	1	1.00		D	Orange brown mottled grey CLAY with occasional sandstone pieces and rootlets			30	90	51	28	23		Washed
TP1	3	2.00		D	Orange brown mottled grey CLAY with occasional sandstone pieces and rootlets			34	90	57	27	30		Washed
TP2	4	1.50		D	Orange brown mottled grey CLAY with occasional sandstone pieces and rootlets			28	88	52	27	25		Washed
TP3	6	1.00		D	Orange brown mottled grey CLAY with occasional rootlets			34	100	64	27	37		Natural
TP3	8	2.00		D	Orange brown mottled grey CLAY with occasional rootlets			38	100	55	29	26		Natural

All tests performed in accordance with BS1377:1990 unless specified otherwise

Key			Date Printed	Approved By	Table
Density test	Liquid Limit	Particle density	12/10/2021	kb	sheet
Linear measurement unless :	4pt cone unless :	sp - small pyknometer			
wd - water displacement	cas - Casagrande method	gj - gas jar			
wi - immersion in water	1pt - single point test				

Peter Baxter Associates Laboratories
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UKAS TESTING 4295

Summary of Geotechnical Chemical Test Results

Project No.	Project Name		
1370/54	Little Park Farm, Hurstpierpoint		
Client Ref	Client	Sampled by	Client
N/A	Ron Carr Geotechnical Services	Date received	05-10-21
		Date tested	07-10-21

Hole No.	Sample Ref	Top	Base	Type	Soil Description	Org %	LOI %	pH	Sulphate as SO_4 Total acid sol. %	Sulphate as SO_4 2:1 water :soil g/l	Sulphate as SO_4 ground water g/l	Chloride, Cl water sol. %	Chloride, Cl acid sol. %	CO_2 %	TDS mg/l	<2mm %	Remarks
TP1	2	1.50		D	Orange brown CLAY with rootlets and occasional gravel			7.5		0.07						82	
TP2	5	2.00		D	Orange brown CLAY with occasional gravel			7.3		0.13						89	
TP3	7	1.50		D	Orange brown CLAY with rootlets			6.8		0.03						100	

Remarks
The results relate only to the items tested

Key	Date Printed	Approved By	Table
Tests performed in accordance with BS 1377-3:2018 unless annotated otherwise Org Organic matter content LOI Mass loss on ignition at 440°C Cl Chloride content CO_2 Carbonate content (rapid titration) TDS Total Dissolved Solids	08/10/2021	kb	sheet

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UKAS TESTING
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Ron Carr
R Carr Geotechnical Services
9 The Mallows
Maidstone
Kent
ME14 2PX

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 21-11980

Site Reference:	Little Park Farm, Hurstpierpoint
Project / Job Ref:	3903
Order No:	3903
Sample Receipt Date:	05/10/2021
Sample Scheduled Date:	05/10/2021
Report Issue Number:	1
Reporting Date:	13/10/2021

Authorised by:

Dave Ashworth
Technical Manager

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

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Soil Analysis Certificate						
DETS Report No: 21-11980	Date Sampled	04/10/21	04/10/21	04/10/21	04/10/21	04/10/21
R Carr Geotechnical Services	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP1	TP2	TP3	TP1	TP2
Project / Job Ref: 3903	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 3903	Depth (m)	0.25	0.25	0.25	0.50	0.50
Reporting Date: 13/10/2021	DETS Sample No	567271	567272	567273	567274	567275

Determinand	Unit	RL	Accreditation			(n)		
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	MCERTS	7.8	6.0	7.0	7.2	6.0
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	506	245	307	< 200	< 200
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.05	0.02	0.03	< 0.02	< 0.02
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
Organic Matter (SOM)	%	< 0.1	NONE	4.2	1.9	2	0.9	2
TOC (Total Organic Carbon)	%	< 0.1	NONE	2.4	1.1	1.2	0.5	1.2
Arsenic (As)	mg/kg	< 2	MCERTS	13	13	9	14	20
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3	< 0.2	0.3	< 0.2	< 0.2
Chromium (Cr)	mg/kg	< 2	MCERTS	10	9	9	10	12
Copper (Cu)	mg/kg	< 4	MCERTS	24	10	12	15	15
Lead (Pb)	mg/kg	< 3	MCERTS	51	24	31	13	9
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	16	13	7	24	30
Selenium (Se)	mg/kg	< 2	MCERTS	< 3	< 3	< 3	< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	78	54	95	326	55
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
EPH (C10 - C40)	mg/kg	< 6	MCERTS	8	34	< 6	< 6	< 6

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion

Subcontracted analysis (S)

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate						
DETS Report No: 21-11980	Date Sampled	04/10/21				
R Carr Geotechnical Services	Time Sampled	None Supplied				
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP3				
Project / Job Ref: 3903	Additional Refs	None Supplied				
Order No: 3903	Depth (m)	0.50				
Reporting Date: 13/10/2021	DETS Sample No	567276				

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected				
pH	pH Units	N/a	MCERTS	6.9				
Total Cyanide	mg/kg	< 2	NONE	< 2				
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	< 200				
Total Sulphate as SO_4	%	< 0.02	MCERTS	< 0.02				
Sulphide	mg/kg	< 5	NONE	< 5				
Organic Matter (SOM)	%	< 0.1	NONE	0.8				
TOC (Total Organic Carbon)	%	< 0.1	NONE	0.5				
Arsenic (As)	mg/kg	< 2	MCERTS	8				
W/S Boron	mg/kg	< 1	NONE	< 1				
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	< 0.2				
Chromium (Cr)	mg/kg	< 2	MCERTS	10				
Copper (Cu)	mg/kg	< 4	MCERTS	9				
Lead (Pb)	mg/kg	< 3	MCERTS	11				
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1				
Nickel (Ni)	mg/kg	< 3	MCERTS	12				
Selenium (Se)	mg/kg	< 2	MCERTS	< 3				
Zinc (Zn)	mg/kg	< 3	MCERTS	45				
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2				
EPH (C10 - C40)	mg/kg	< 6	MCERTS	< 6				

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 21-11980	Date Sampled	04/10/21	04/10/21	04/10/21	04/10/21	04/10/21
R Carr Geotechnical Services	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP1	TP2	TP3	TP1	TP2
Project / Job Ref: 3903	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 3903	Depth (m)	0.25	0.25	0.25	0.50	0.50
Reporting Date: 13/10/2021	DETS Sample No	567271	567272	567273	567274	567275

Determinand	Unit	RL	Accreditation					
				(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.60	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	0.18	1.06	0.16	< 0.1	< 0.1
Pyrene	mg/kg	< 0.1	MCERTS	0.20	0.91	0.19	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.29	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.39	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.40	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.24	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.16	< 0.1	< 0.1	< 0.1
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.15	< 0.1	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	4.3	< 1.6	< 1.6	< 1.6

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 21-11980	Date Sampled	04/10/21				
R Carr Geotechnical Services	Time Sampled	None Supplied				
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP3				
Project / Job Ref: 3903	Additional Refs	None Supplied				
Order No: 3903	Depth (m)	0.50				
Reporting Date: 13/10/2021	DETS Sample No	567276				

Determinand	Unit	RL	Accreditation				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6			

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 21-11980	Date Sampled	04/10/21	04/10/21	04/10/21	04/10/21	04/10/21
R Carr Geotechnical Services	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP1	TP2	TP3	TP1	TP2
Project / Job Ref: 3903	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 3903	Depth (m)	0.25	0.25	0.25	0.50	0.50
Reporting Date: 13/10/2021	DETS Sample No	567271	567272	567273	567274	567275

Determinand	Unit	RL	Accreditation	(n)				
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	< 3	< 3	< 3	< 3
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2	4	< 2	< 2	< 2
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3	4	< 3	< 3	< 3
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21	< 21	< 21
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42	< 42	< 42

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 21-11980	Date Sampled	04/10/21				
R Carr Geotechnical Services	Time Sampled	None Supplied				
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP3				
Project / Job Ref: 3903	Additional Refs	None Supplied				
Order No: 3903	Depth (m)	0.50				
Reporting Date: 13/10/2021	DETS Sample No	567276				

Determinand	Unit	RL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01				
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aliphatic >C8 - C10	mg/kg	< 2	MCERTS	< 2				
Aliphatic >C10 - C12	mg/kg	< 2	MCERTS	< 2				
Aliphatic >C12 - C16	mg/kg	< 3	MCERTS	< 3				
Aliphatic >C16 - C21	mg/kg	< 3	MCERTS	< 3				
Aliphatic >C21 - C34	mg/kg	< 10	MCERTS	< 10				
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21				
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01				
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05				
Aromatic >C8 - C10	mg/kg	< 2	MCERTS	< 2				
Aromatic >C10 - C12	mg/kg	< 2	MCERTS	< 2				
Aromatic >C12 - C16	mg/kg	< 2	MCERTS	< 2				
Aromatic >C16 - C21	mg/kg	< 3	MCERTS	< 3				
Aromatic >C21 - C35	mg/kg	< 10	MCERTS	< 10				
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21				
Total >C5 - C35	mg/kg	< 42	NONE	< 42				

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Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 21-11980	Date Sampled	04/10/21	04/10/21	04/10/21	04/10/21	04/10/21
R Carr Geotechnical Services	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP1	TP2	TP3	TP1	TP2
Project / Job Ref: 3903	Additional Refs	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 3903	Depth (m)	0.25	0.25	0.25	0.50	0.50
Reporting Date: 13/10/2021	DETS Sample No	567271	567272	567273	567274	567275

Determinand	Unit	RL	Accreditation	(n)				
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

(n) Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation

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Soil Analysis Certificate - BTEX / MTBE							
DETS Report No: 21-11980	Date Sampled	04/10/21					
R Carr Geotechnical Services	Time Sampled	None Supplied					
Site Reference: Little Park Farm, Hurstpierpoint	TP / BH No	TP3					
Project / Job Ref: 3903	Additional Refs	None Supplied					
Order No: 3903	Depth (m)	0.50					
Reporting Date: 13/10/2021	DETS Sample No	567276					

Determinand	Unit	RL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2				
Toluene	ug/kg	< 5	MCERTS	< 5				
Ethylbenzene	ug/kg	< 2	MCERTS	< 2				
p & m-xylene	ug/kg	< 2	MCERTS	< 2				
o-xylene	ug/kg	< 2	MCERTS	< 2				
MTBE	ug/kg	< 5	MCERTS	< 5				

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mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

UKAS TESTING

Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 21-11980	
R Carr Geotechnical Services	
Site Reference: Little Park Farm, Hurstpierpoint	
Project / Job Ref: 3903	
Order No: 3903	
Reporting Date: 13/10/2021	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
567271	TP1	None Supplied	0.25	21.8	Brown sandy clay with stones and brick
567272	TP2	None Supplied	0.25	17.9	Light brown clay with stones
567273	TP3	None Supplied	0.25	19.5	Brown sandy clay
567274	TP1	None Supplied	0.50	18.4	Light brown sandy clay
567275	TP2	None Supplied	0.50	19.9	Light brown sandy clay
567276	TP3	None Supplied	0.50	18.3	Brown sandy clay

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information
DETS Report No: 21-11980
R Carr Geotechnical Services
Site Reference: Little Park Farm, Hurstpierpoint
Project / Job Ref: 3903
Order No: 3903
Reporting Date: 13/10/2021

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

7.4 **Appendix D – Proposed Drainage Strategy & Exceedance Flow Routes, Greenfield Runoff and Hydraulic Calculations**

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

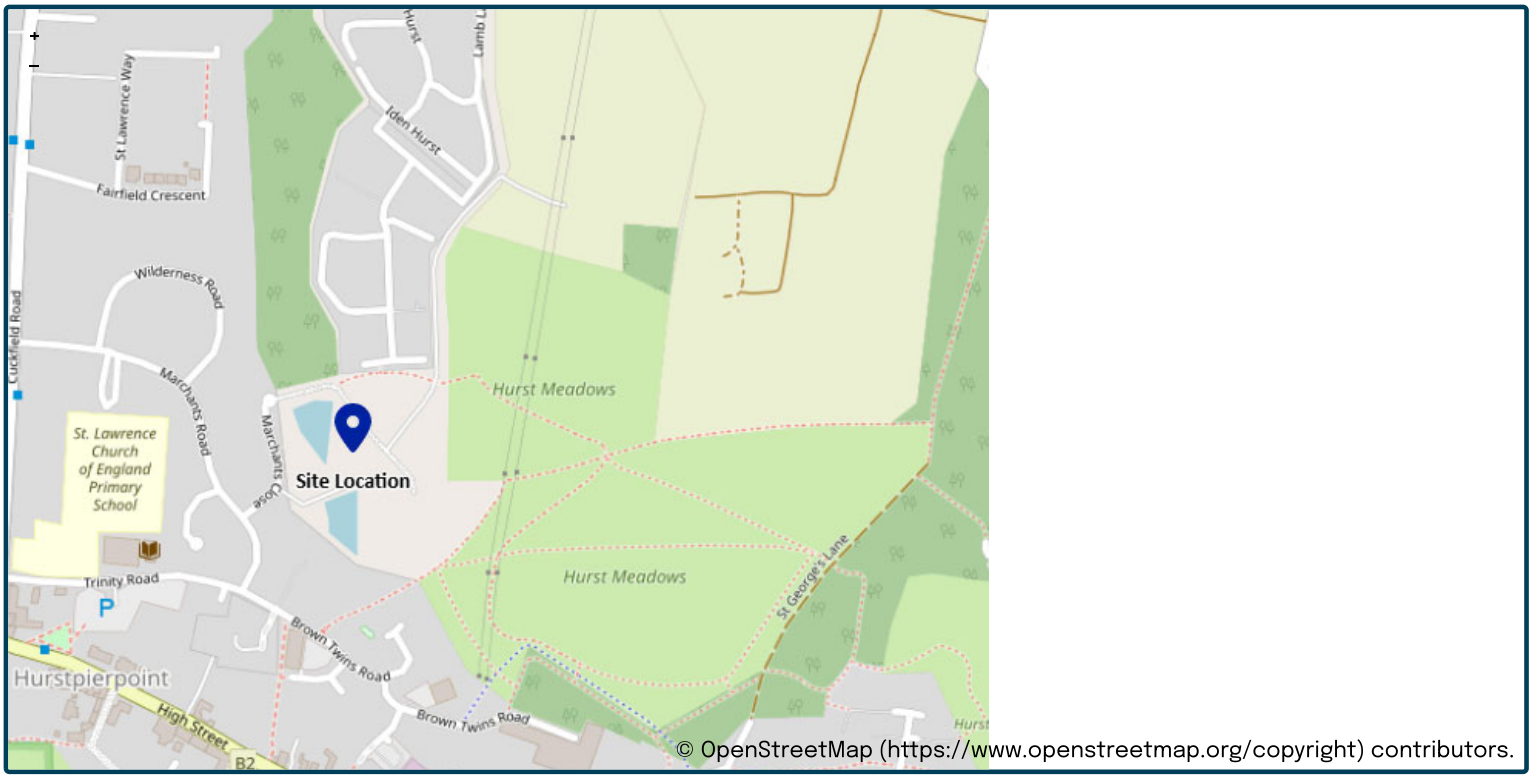
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	10/10/2025
Calculated by	
Reference	
Model version	2.2.1

Location

Site name	
Site location	



Site easting (British National Grid)	528376
Site northing (British National Grid)	116680

Site details

Total site area (ha)	0.208 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	912 mm		
BFIHOST19scaled	0.36		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	1.5 l/s		
QBar (FEH statistical 2025) (l/s)	1.7 l/s		

Growth curve factors

	My value		Map value
Hydrological region	7		7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

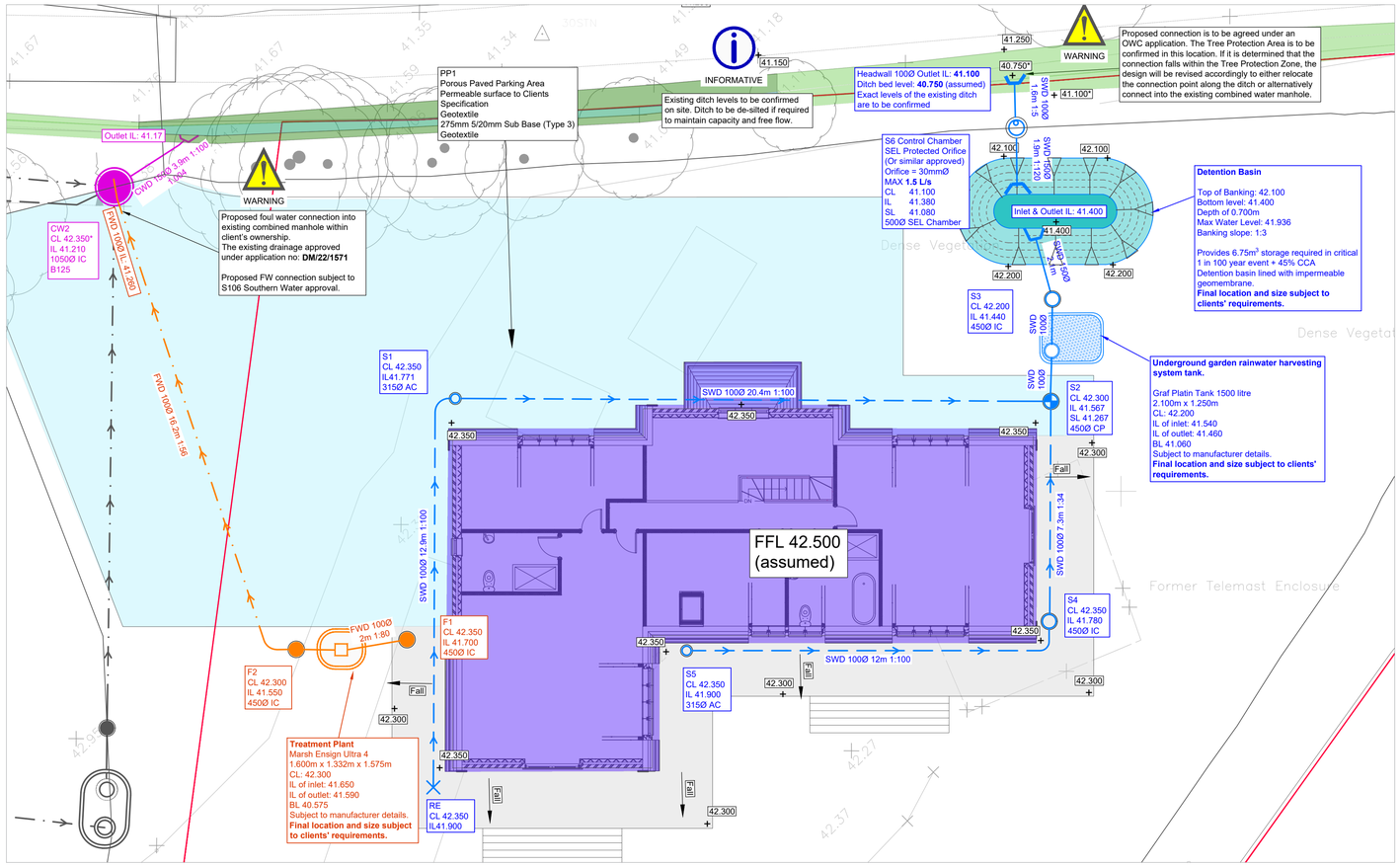
Results

Method	FEH statistical (2025)
Flow rate 1 year (l/s)	1.5 l/s
Flow rate 2 year (l/s)	1.5 l/s
Flow rate 10 years (l/s)	2.8 l/s
Flow rate 30 years (l/s)	4.0 l/s
Flow rate 100 years (l/s)	5.5 l/s
Flow rate 200 years (l/s)	6.5 l/s

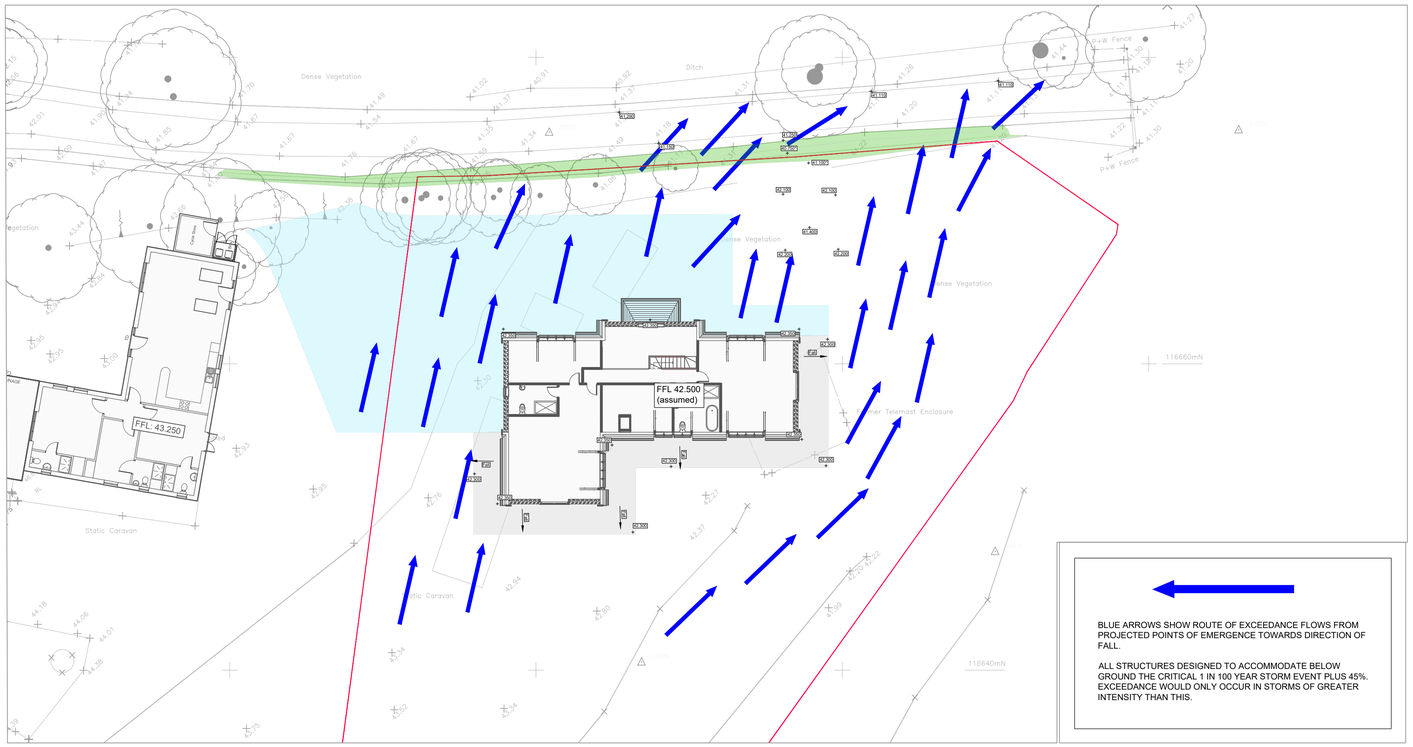
Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.1) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.



PROPOSED DRAINAGE STRATEGY (scale 1:100)



EXCEEDANCE FLOW ROUTES (scale 1:200)

DRAINAGE LEGEND

EXISTING FEATURES

- Existing foul/ storm water 'as built' drainage from neighboring site
- Existing combined water manhole from neighboring site

PROPOSED FEATURES

- SWD — Surface Water Drainage
- Storm water access chamber (300Ø)
- Storm water inspection chamber (450Ø)
- Storm water catchpit chamber (450Ø)
- Storm water rodding eye
- Storm water orifice flow control chamber (500Ø)
- 41.250 + — Proposed surface level (shown indicatively only for drainage purposes)
- 41.340* + — Assumed surface level of the ditch-tbc (shown indicatively only for drainage purposes)
- 00.000 — Finished floor level- assumed, tbc by the Architect
- 100Ø 4.5m 1:100 Z BED — Pipe info - diameter, length, gradient, bedding type

ABBREVIATIONS

MH	- MANHOLE
IC	- INSPECTION CHAMBER
AC	- ACCESS CHAMBER
CP	- CATCHPIT
BC	- BRAKE CHAMBER
RE	- RODDING EYE
IL	- INVERT LEVEL
SL	- SUMP LEVEL
RA	- RESTRICTED ACCESS COVER
CL	- COVER LEVEL
TL	- TOP OF CELLULAR SA
BL	- BASE OF CELLULAR SA
FL	- FORMATION LEVEL

- Site Boundary (as taken from M.J. Humphrey Ltd 'Site Plan February 2025' draw no: 2025/20)
- Proposed roof area **0.018 ha**
- Extent of permeable paving with porous sub-base
- Proposed Footpath

Site Specific Notes

1. Proposed surface and foul water drainage strategy has been designed based on available data from the BGS Map Viewer and the existing drainage design approved under application reference: DM/22/1571
2. Proposed detention basin storage volume and flow control are designed to the critical 1 in 100 year storm event plus an allowance of 45% for the predicted effects of climate change.
3. Surface water flow discharge rate from the new development area has been restricted to 1.5 l/s, reflecting the greenfield runoff rate for the site for the 1-in-1-year rainfall event
4. Proposed storm water connection into the existing ditch is to be agreed under OWC application.
5. Proposed foul water connection is to be agreed under S106 application with Southern Water.

STANDARD DRAINAGE NOTES

1. DO NOT SCALE FROM THIS DRAWING, REFER TO FIGURED DIMENSIONS ONLY. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
2. ALL DIMENSIONS IN MILLIMETRES AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECT AND ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
4. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT AND/OR ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
5. BEFORE COMMENCING CONSTRUCTION THE CONTRACTOR MUST CHECK THE INVERT LEVELS OF EXISTING SEWERS TO WHICH CONNECTIONS ARE MADE. IN ADDITION THE CONTRACTOR MUST LOCATE AND DETERMINE INVERT LEVELS OF THE EXISTING SPURS TO WHICH CONNECTIONS ARE PROPOSED. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER IMMEDIATELY, PRIOR TO CONSTRUCTION.
6. ALL DRAINAGE WORKS SHOULD COMMENCE AT THE PROPOSED DOWNSTREAM CONNECTION POINT, THE WORKS CONTINUING UPSTREAM FOLLOWING CONFIRMATION OF THE TIE-IN INVERT LEVELS TO THE ENGINEER. CONNECTIONS TO MANHOLES OR LARGER SIZED PIPES ETC. SHOULD BE SOFFIT TO SOFFIT UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER, IF THIS IS NOT POSSIBLE INFORM THE ENGINEER IMMEDIATELY.
7. COVER LEVELS SHOWN ARE APPROXIMATE. COVERS AND FRAMES SHALL BE SET TO FINISHED GROUND LEVELS AND FALLS.
8. ALL UN-REFERENCED PIPES ARE TO BE 100mm DIA
9. ALL PIPES TO BE ADOPTED, OR CONNECTING TO ADOPTED SEWERS, TO BE VITRIFIED CLAY TO BS EN 295 AND BS65 (SWS ONLY), OR CONCRETE PIPES TO BE EN 1916 AND BS5911:PART 1.
10. ROAD GULLY OUTLET PIPES ARE TO BE 150mm DIA. WITH CONCRETE SURROUND AND FLEXIBLE JOINTS. ALL GULLIES SHALL BE FITTED WITH GRADE D400 GRATINGS AND FRAMES TO BS EN124, UNLESS OTHERWISE STATED.
11. ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS AND SPECIFICATION LAID DOWN DOWN IN 'SEWERS FOR ADOPTION' 6th EDITION, WITH A VIEW TO ADOPTION UPON COMPLETION OF WORKS.
12. ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT PART-H, AND TO THE SATISFACTION OF THE BUILDING CONTROL INSPECTOR.
13. THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
14. STUB CONNECTIONS TO ADOPTABLE MANHOLES SHALL BE MADE FROM VITRIFIED CLAY AND CONSIST OF TWO ROCKER PIPES LAID AT THE SAME GRADIENT AS THE UP OR DOWNSTREAM PIPE.
15. IF ANY SUB SOIL DRAINAGE SYSTEMS ARE UNCOVERED DURING THE WORKS CONTACT THE ENGINEER FOR INSTRUCTIONS. SUB SOIL DRAINS ARE TO BE DIVERTED AROUND NEW WORKS AND CONNECTED INTO THE SURFACE WATER.
16. NO PRIVATE AREAS ARE TO DRAIN ONTO ADOPTABLE AREAS AND VICE VERSA.
17. ALL EXISTING MANHOLE COVER'S, GULLIES, ETC, ARE TO BE RAISED/LOWERED TO SUIT NEW LEVELS.
18. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE LOCATION AND DEPTH OF ALL EXISTING SERVICES AND UTILITIES THAT MAY BE PRESENT
19. UPON COMPLETION BUT PRIOR TO HANDOVER, CONTRACTOR TO CARRY OUT FULL CCTV SURVEY OF DRAINAGE SYSTEM WHICH IS TO BE REVIEWED BY ENGINEER TO ENSURE SATISFACTORY INSTALLATION
20. PROPRIETARY PRODUCTS TO BE INSTALLED IN FULL ACCORDANCE WITH MANUFACTURER'S GUIDANCE.
21. MANHOLE AND CHAMBER COVER GRADES:
    - 'A15' IN ALL LANDSCAPED AREAS AND ON FOOTPATHS
    - 'B125' IN ALL DRIVEWAYS
    - 'C250' IN PRIVATE PARKING AREAS
    - 'D400' IN CARRIAGEWAY/ACCESS ROAD

Prefixed to drawing numbers shall signify the following:-

PL = PLANNING	**Shall not be used for contract or construction purposes**
P = PRELIMINARY	**Shall not be used for contract or construction purposes**
T = TENDER	**Shall not be used for construction purposes**
C = CONSTRUCTION	These are the only drawings that shall be used for construction purposes
R = RECORD	Record of actual completed work

DESIGN SUBJECT TO THE APPROVAL OF:
PLANNING AUTHORITY
BUILDING CONTROL
WATER AUTHORITY

DESIGN SUBJECT TO THE CONFIRMATION OF:
EXTERNAL LEVELS DESIGN
GROUNDWATER DEPTH
ORDINARY WATERCOURSE APPROVAL
LOCATION AND DEPTH OF EXISTING UTILITIES
ROOT PROTECTION AREAS

FOR PLANNING ONLY

REV	DATE	DESCRIPTION	BY	CHK	APP
PL1	10.12.25	UPDATED TO NEW SITE PLAN	KCK	CS	CS
P-	24.10.25	PRELIMINARY ISSUE	MR	CS	CS

cgs civils
Consulting Civil Engineers

CLIENT: HEATHLAND HURSTPIERPOINT LTD
ARCHITECT: M.J. HUMPHREY LTD
JOB TITLE: LAND ADJACENT TO THE MEADOW LITTLE PARK LANE , HURSTPIERPOINT
DRAWING TITLE: PROPOSED DRAINAGE STRATEGY & EXCEEDANCE FLOW ROUTES

DRAWN	ENGINEER	CHECKED	APPROVED
MR	CS	CS	CS

DATE	SCALE @ A1
OCTOBER 2025	AS SHOWN

JOB No.	STATUS	DRAWING No.	REV.
C1900A	PL	101	PL1

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	4.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	75.0		

Nodes

Name	Area (ha)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
Detention Basin	0.018	42.100	450	528479.103	116663.534	0.700

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
10	0	0	0
30	0	0	0
30	45	0	0
100	0	0	0
100	45	0	0

Node Detention Basin Online Orifice Control

Flap Valve	x	Design Depth (m)	0.600	Discharge Coefficient	0.600
Replaces Downstream Link	x	Design Flow (l/s)	1.5		
Invert Level (m)	41.400	Diameter (m)	0.030		

Node Detention Basin Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	41.400
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	89

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	4.0	0.0	0.200	9.4	0.0	0.400	17.0	0.0	0.600	26.9	0.0
0.100	6.4	0.0	0.300	12.9	0.0	0.500	21.7	0.0	0.700	32.7	0.0

Results for 1 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute summer	Detention Basin	74	41.534	0.134	1.3	0.7753	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
120 minute summer	Detention Basin	Orifice	0.6	2.5

Results for 10 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Detention Basin	43	41.712	0.312	4.5	2.6307	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute summer	Detention Basin	Orifice	1.0	4.6

Results for 30 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Detention Basin	44	41.782	0.382	6.0	3.6823	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute summer	Detention Basin	Orifice	1.1	6.1

Results for 30 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Detention Basin	49	41.893	0.493	6.1	5.7815	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	Detention Basin	Orifice	1.3	8.8

Results for 100 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	Detention Basin	46	41.853	0.453	7.6	4.9503	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute summer	Detention Basin	Orifice	1.2	7.8

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Detention Basin	52	41.977	0.577	7.8	7.7842	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
60 minute winter	Detention Basin	Orifice	1.4	11.3

7.5 Appendix E – Maintenance Schedule

Consulting Civil Engineers

SuDS Maintenance Schedule

Land Adjacent to the Meadow Little Park Farm, Hurstpierpoint

Planning Ref: DM/25/1549

For

Heathland Hurstpierpoint Ltd

Rev – P-

Reference C3917

Date 24th October 2025

Revision	Date of Issue	Comments	Prepared By	Checked By
P-	24/10/2025	Initial Issue	MR	CS

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1 Maintenance

1.1 Introduction

1.1.1 During construction, the Contractor will be responsible for maintaining the drainage and SuDS (Sustainable Drainage Systems). Upon handover, the occupier will take on the responsibility of these duties as laid out in this report.

1.1.2 The maintenance schedule for the proposed development will be split down into two separate categories; SuDS features and regular private drainage.

1.2 SuDS at Land Adjacent to the Meadows Little Park Farm, Hurstpierpoint

1.2.1 As listed above, in section 5.1.2, the SuDS features used on site will be **Rainwater Harvesting Tank, Detention Basin, Permeable Paving (awaiting confirmation of driveway location)**

1.2.2 The SuDS features have been designed for easy maintenance and comprise:

- Regular Day-to-Day care – litter collection, regular gardening to control vegetation growth and checking inlets where water enters the SuDS features
- Occasional tasks – checking the SuDS features and removing any silt that builds up in the SuDS feature
- Remedial work – repairing damage where necessary

1.3 SuDS Drainage Maintenance Specification

1.3.1 Rainwater Harvesting Tank

In order to maintain the functioning of the rainwater harvesting tanks, the following maintenance requirements should be adhered to:

Operation and maintenance requirements for rainwater harvesting tanks		
Maintenance Schedule	**Required Action**	**Typical Frequency**
Regular Maintenance	Ensure that all inlets and outlets are clear of debris and blockage	Weekly
	Remove debris inlets and outlets	Weekly
	Inspect first flush diverter to ensure it is working correctly and not clogged	Weekly – Clean if necessary
	Clean Filter screens	Monthly – Replace if damaged
	Inspect the tank for sediment build-up and any signs of algae	Monthly
	Inspect roof and gutters and clear of all debris	Every 3 months
	Inspect pump for any signs of wear or damage and test to ensure it is functioning correctly	Every 3 months
	Check bottom of the tank for sediment build-up and clear if necessary	Every 6 months
	Ensure all downpipes are clear and functioning correctly and clear if necessary	Every 6 months
	Test water	Every 6 months
	Thorough tank cleaning – drain tank, scrub interior and rinse	Annually or as required
	Service the pump and filtration system and replace any worn parts	Annually
	Inspect overflow to ensure it is working correctly and clear any obstructions	Annually
Monitoring	Monitor Water levels	Annually
	Inspect for pests e.g mosquitoes and take measures to prevent	As required

1.3.2 Permeable Paving

In order to maintain the functioning of the permeable paving, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for permeable paving

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required take remedial action	Three-monthly, 48h after large storms in first six months
	Inspect silt accumulation rate and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

1.3.3 Detention Basin

In order to maintain the functioning of the Detention Basin, the following maintenance requirements should be adhered to:

Table 21.3 Operation and maintenance requirements for Infiltration Basins

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Remove litter, debris, and trash	Monthly
	Cut the grass – for landscaped areas	Monthly (during growing season) or as required
	Cut the meadow grass in and around basin	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetations and remove nuisance plants (for the first 3 years)	Monthly (at start, then as required)
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseeding or re-turfing	As required
	Realign the rip-rap	As required
	Repair / rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surface and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages and clean if required	Monthly
	Inspect banksides, structure, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half Yearly
	Inspect infiltration surface for compaction and ponding	Monthly

1.4 General Drainage Maintenance Specification

1.4.1 Inlet Structures and Inspection Chambers

- Inlet structures such as rainwater downpipes, road gullies and channel drains should be free from obstruction at all times to all free flow through the SuDS
- Inspection Chambers and Rodding Eyes are used on bends or where pipes come together. They allow access and cleaning to the system if necessary.

Inlet Structures and Inspection Chambers	
Regular Maintenance	**Frequency**
Inlet Structures **Inspect rainwater downpipes, channel drains and road gullies, removing obstructions and silt as necessary. Check that there is no physical damage.** **Strim vegetation 1m min surround to structures and keep area free from silt and debris**	Monthly
Inspections Chambers and below ground control chambers. **Remove cover and inspect, ensuring that the water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.** **Undertake inspection after leaf fall in Autumn**	Annually
Occasional Maintenance **Check topsoil levels are 20mm above edges of chambers to avoid mower damage.**	As necessary
Remedial Work **Repair physical damage if necessary**	As required

1.4.2 Below ground drainage pipes

- Below ground drainage pipes convey water to the SuDS system. They should always be free from obstruction to allow free flow.

Below Ground Drainage Pipes	
Regular Maintenance	**Frequency**
Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months then annually
Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
Remove sediment from pre-treatment inlet structures and inspection chambers.	Annually or as required
Maintain vegetation to designed limits within the vicinity of below ground drainage pipes and tanks.	Monthly or as required
Remedial Work **Repair physical damage if necessary**	As required
Monitoring **Inspect all inlets, outlets and vents to ensure that they are in good conditions and operating as designed.**	Annually
Survey inside of pipe runs for sediment build up and remove if necessary.	Every 5 years or as required