APPENDICES

Appendix A Architectural Development Proposals

NOTES

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Ground Floor Plan @ 1:100

5 0 5 10

Scale Bar 1:100

N

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DRAWING TITLE
Ground Floor Plan
As Proposed

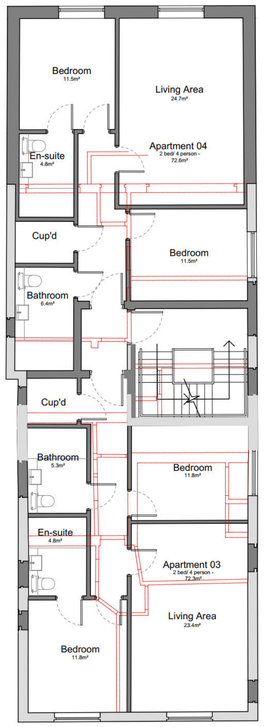
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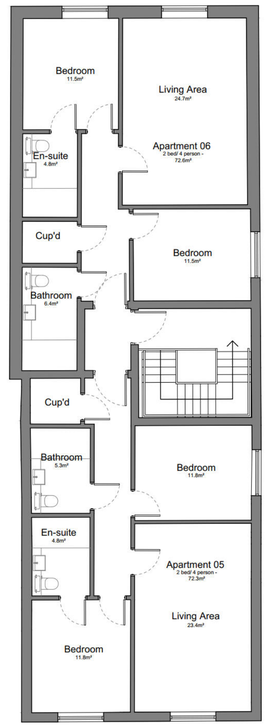
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26008	2.02	/

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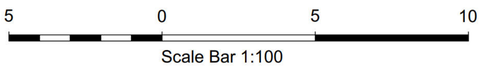
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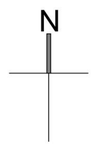
First Floor Plan @ 1:100



Second Floor Plan @ 1:100



Scale Bar 1:100



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DRAWING TITLE
First & Second Floor Plans
As Proposed

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South Elevation @ 1:100



East Elevation @ 1:100



West Elevation @ 1:100



North Elevation @ 1:100

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DRAWING TITLE
Elevations
As Proposed

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Appendix B Topographic Survey



NOTES

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DRAWING TITLE
Topographical Survey
As Existing

DATE	SCALE	DRAWN BY	CHECKED BY
Feb 2024	1:200 on A3	KD	MF

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24010	1.01	/

Appendix C Ashdown Site Investigation Reporting

ASHDOWN
SITE INVESTIGATION

GEOTECHNICAL ASSESSMENT AND QUANTITATIVE GROUND CONTAMINATION RISK ASSESSMENT REPORT

ARUNDEL COURT
47 ELMER ROAD
BOGNOR REGIS
WEST SUSSEX

PROJECT REFERENCE: P16949

REPORT REFERENCE: R16517

Report Beneficiary: Sussex Develop & Build Ltd

Document Control				
Issue No.	**Status**	**Issue Date**	**Notes**	
1	Final	8th January 2025		
Report Section			**Prepared By**	**Approved By**
Factual Section			Tom Hughes BA MA	Rebecca Webb BSc FGS
Geotechnical Assessment			Adam Cormack HNC FGS	Steven McSwiney BA mod Geol MSc FGS
Quantitative Ground Contamination Risk Assessment			Stuart Card BA (Hons)	Alex Minchell-Bewick BSc MSc DIC AIEMA MIEnvSc CEnv

Limitations

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This report is not intended to be either an ecological, archaeological or flood risk assessment. An appropriate specialist should be consulted about any concerns that may arise in this regard.

EXECUTIVE SUMMARY

The following presents a summary of the main findings of the report. It is emphasised that no reliance should be placed on any individual point until the whole of the report has been read as other sections of the report may put into context the information contained herein.

It is proposed to provide additional flats at the site by means of the construction an additional storey to the existing building and the provision of a three-storey rear extension. It is understood that the only soft landscaping to be provided are ancillary areas of planting around areas of car parking.

Reference to geological datasets indicates that the site is expected to be underlain by the River Terrace Deposits overlying the White Chalk Subgroup. The ground investigation confirmed the underlying soils to comprise a shallow thickness of made ground, overlying River Terrace Deposits and, in turn, White Chalk Subgroup deposits. Suspected asbestos material was encountered within the made ground soils.

The River Terrace Deposits are classed as a Secondary A Aquifer, whilst the White Chalk Subgroup is classed as a Principal Aquifer. The site does not lie within a SPZ. Groundwater was encountered at depths of between 1.00m and 1.90m during the ground investigation. Longer term groundwater monitoring is currently ongoing.

It is recommended that the design of precautions against shrinkage and heave for any new shallow foundation system should assume a medium volume change potential for the fine-grained River Terrace Deposits.

A net allowable bearing capacity of 100kN/m^2 may be assumed for spread (pad or strip) foundations up to 1.50m across bearing within the River Terrace Deposits of at least firm consistency (Minimum shear strength of 50kN/m^2). This figure may be increased to 150kN/m^2 where River Terrace Deposits possessing a shear strength of at least 65kN/m^2 are consistently present beneath foundation formation levels.

In consideration of the variable strength of the soils, particularly given firm soils were encountered beneath stiff soils in borehole WS04, it is recommended that all foundation excavations should be inspected prior to pouring of concrete to ensure that the shear strength of the soils at formation level comply with the soil shear strengths adopted in design.

A DS-1 Design Sulfate Class and an AC-1 ACEC classification should be assumed as a minimum for the design of concrete in contact with the ground.

Ground floors should be suspended unless the conditions set out within this report can be met.

The ground investigation has recorded concentrations of lead above screening values, the presence of chrysotile asbestos cement, and concentrations of PAH compounds above the threshold values for use of PE water supply pipe within the made ground. Remedial measures will be required to address these risks, the extent of which should be detailed in a separate remediation strategy report.

It is recommended that this report is submitted to the relevant regulator in relation to the relevant conditions with respect to contaminated land. The report should also be submitted to any other relevant warrantor for the development.

The conclusions drawn in this report should be considered as provisional until such time as the report has been accepted and the relevant conditions have been discharged, though a remediation strategy is likely to be required to satisfy any pre-commencement planning or warrantor conditions.

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FIGURES AND APPENDICES

FIGURES

Figure 1 Site Location Plan
Figure 2 Site Plan

APPENDIX A

Proposed Development Layout

APPENDIX B

Explanatory Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records

APPENDIX C

Geotechnical Laboratory Test Results
Contamination Laboratory Test Results

APPENDIX D

Classification of Probability, Consequence and Risk

APPENDIX E

Preliminary Conceptual Model

APPENDIX F

Quantitative Conceptual Model

1. INTRODUCTION

It is proposed to redevelop the site at Arundel Court, Elmer Road, Bognor Regis, West Sussex to provide additional flats by means of the construction an additional storey to the existing residential building and provision of a three-storey rear extension. It is understood that the only soft landscaping to be provided are ancillary areas of planting around areas of car parking. A copy of the proposed development layout is presented in Appendix A.

Ashdown Site Investigation Ltd was requested to undertake a ground investigation, provide advice to assist with the structural design and to undertake a quantitative ground contamination risk assessment to assist with the planning application.

The specific objectives of the works were to:

a) Establish the expected geology and hydrogeology at the site;
b) Investigate the shallow ground and groundwater conditions in the area of the proposed development;
c) Provide advice to assist others in undertaking design of spread foundations and ground floors;
d) Test for the presence of contaminants identified by the preliminary conceptual model; and
e) Develop a quantitative conceptual model of the site, refining the preliminary model to identify any pollutant linkages that may be present.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q14514, dated 17th September 2024. The instruction to proceed was received on behalf of the client, Sussex Develop and Build Ltd.

A Preliminary Ground Contamination Risk Assessment Report[1] has been prepared by Ashdown Site Investigation Ltd., the findings of which have been used to inform the quantitative risk assessment. An In Situ Infiltration Test Report[2] has also been prepared by Ashdown Site Investigation Ltd.

[1] Project Ref: P16949, Report Ref: R16514, dated 10th January 2025.
[2] Project Ref: P16949, Report Ref: R16515, dated 20th December 2024.

2. SITE CONTEXT

2.1 Site Description

The site is located on the northern side of Elmer Road, Elmer, West Sussex, and is centred on the approximate Ordnance Survey national grid reference 497569, 100423. A site location plan and a site plan are presented as Figure 1 and Figure 2, respectively.

The site comprises a rectangular shaped parcel of land with a two-storey block of flats at the southern end. One of the ground floor units appeared to have a private paved garden area. An access drive along the eastern side of the site leads to a parking area in the north, with two domestic garage units present at the northern end of the site.

The site is located within a largely residential area. The building to the east is currently in use as a café. However, historical street imagery shows it was formerly a vehicle sales and servicing garage and MOT centre.

2.2 Geological and Hydrogeological Data

The pertinent geological and hydrogeological data for the site is presented below. Further information as to the geological and hydrogeological setting of the site is presented within the preliminary ground contamination risk assessment report.

2.2.1 Expected Geology and Aquifer Designation

The stratigraphic succession that may be expected to underlie the site has been established by reference to British Geological Survey (BGS) mapping and the BGS Lexicon of Named Rock Units. The expected stratigraphy is presented in the following table.

Table 1. Expected Strata and Aquifer Designation

Type	Stratum	Aquifer Designation
Superficial	River Terrace Deposits	Secondary A Aquifer
Bedrock	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) (White Chalk Subgroup)	Principal Aquifer

The River Terrace Deposits generally comprise well graded sandy fine to coarse gravel. Locally sand or gravel strata may predominate. Lenses of clay, silt and localised peat may be present. Gravels normally include a high proportion of subangular flint and chert and Lower Greensand rock types.

Areas denoted as Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) are where the White Chalk Subgroup deposits cannot be differentiated into their various formations. In this area the White Chalk Subgroup comprises chalk with flints. The Subgroup contains discrete marl seams, nodular chalk and flint seams throughout. The formation is of Maastrichtian to Cenomanian age (66 to 100.5 million years old; Late Cretaceous). The subgroup is recorded by the BGS to range in thickness up to 470 to 515m in the Hampshire/Sussex Area.

2.2.2 Natural Ground and Mining Hazards

The chalk can be expected to have a deeply convoluted upper surface as a result of solution weathering and erosion. The presence of natural cavities in the chalk is very rare and solution features, if present, can be expected to be infilled with Quaternary Superficial Deposits. The infill material may be significantly weaker than the surrounding chalk. Solution features can comprise pipes extending to several metres deep into the chalk or conical depressions and basin shaped structures. The desk-based information contained with the preliminary ground contamination risk assessment report did not identify any natural cavities or sinkholes within 500m of the site and the hazard rating for ground dissolution was very low.

Historically, chalk deposits were often mined locally. Most commonly historical mines characteristically comprise a narrow shaft with a number of chambers radiating from the base. These structures are colloquially known as “deneholes”, “chalk-wells” or “chalkangles”.

The depth of the features reflects the depth to the underlying chalk bedrock. The shaft width was commonly in the order of 2m to 3m, widening out into galleries at depth. The chalk was extracted for soil improvement and was usually applied directly to fields though sometimes the chalk was processed, typically by burning in kilns where the chalk was used to produce quicklime (calcium oxide).

Once they had reached their limits the mines were commonly capped. Various capping techniques were used; examples include the use of upturned trees or brick arching. Records pertaining to the distribution of these localised mines are incomplete, usually being limited to features marked as shafts or the occurrence of circular depressions on historic Ordnance Survey maps. In the field they are most likely to be visible as shallow depressions, if at all.

The desk-based information did not record any significant mining features on or within the vicinity of the site. A search of the Chelsea Speleological Society records revealed no records within 1km of the site. The risk posed to the development is considered to be negligible to very low.

Further assessment of the natural ground and mining hazards can be undertaken, if required, to provide more detailed comment specific to the site.

2.2.3 Radon

Table 2. Radon

Section	Groundsure Comment
Radon Affected Areas	The site is reported to be within an area where less than 1% of properties are at or above the action level requiring radon gas protection measures to be installed in new buildings.
Radon Protection Measures	No radon protection measures are reported by the British Geological Survey to be necessary in the construction of new dwellings or extensions.

2.2.1 Groundwater Abstractions

The closest active groundwater abstraction licence is recorded to lie 1880m to the north-east of the site and is recorded as being for general farming and domestic purposes.

2.2.2 Surface Water Abstractions

The closest surface water abstraction licence is recorded to lie 1339m to the north-east of the site and is used for spray irrigation purposes.

2.2.3 Potable Abstractions

No potable abstraction licences are indicated within 2km of the site.

2.2.4 Groundwater Source Protection Zones (SPZ)

The Environment Agency defines SPZs as those areas where groundwater supplies are at risk from potentially polluting activities and accidental releases of pollutants. SPZs are primarily a policy tool used to control activities close to water supplies intended for human consumption.

The site does not lie within a SPZ.

3. SITE WORKS

3.1 Introduction

The intrusive site works comprised a series of dynamic sampler boreholes and a single hand dug trial pit, together with accompanying in-situ geotechnical testing. The intrusive work was carried out on 2nd December 2024. The exploratory hole locations are shown on Figure 2.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole records given in Appendix B, which also includes explanatory notes to assist in their interpretation.

3.2 Exploratory Holes

The following table summarises the intrusive works undertaken at the site.

Table 3. Summary of Intrusive Works Undertaken

Designation	Depth (m bgl)	Method
WS01	3.00	Dynamic Sampler
WS02	5.00	Dynamic Sampler
WS03	3.00	Dynamic Sampler
WS04	3.00	Dynamic Sampler
TP01	0.96*	Hand Dug Pit

Notes: * Average pit depth.

3.3 Sampling

Samples of soil were taken from the exploratory holes at the depths shown in the exploratory hole records. The types of samples taken are indicated on the exploratory hole records. Details on the sample types are provided in the explanatory notes.

Where appropriate, samples were stored in cool boxes with cooling blocks to maintain temperatures below 4°C until transferred to refrigerators upon return to the office and subsequently forwarded to the external accredited chemical testing laboratory.

3.4 In Situ Strength Testing

The types and depths of in situ testing, together with the test results, are either given on the exploratory hole records or are summarised separately in Appendix B. Further details on the in situ testing methods are provided in the explanatory notes.

3.5 In Situ Infiltration Testing

Falling head soakage testing was undertaken in trial pit TP01. The results of this testing are presented and discussed separately in the In Situ Infiltration Test Report[3].

[3] Project Ref: P16949, Report Ref: R16515, dated 20th December 2024.

3.6 Installations

A single groundwater monitoring standpipe was installed in borehole WS02 to a depth of 4.00m. A description of the installation is shown on the exploratory hole record.

A groundwater data logger was installed within the standpipe on 2nd December 2024. The data logger was programmed to collect readings at 60-minute intervals for the duration of 7 months. The results of the groundwater monitoring will be issued at the end of the scheduled monitoring period.

3.7 Laboratory Testing

Laboratory testing was scheduled by Ashdown Site Investigation Ltd. Results from the laboratory tests are provided in Appendix C.

Geotechnical testing was undertaken by Ashdown Site Investigation Ltd.

Chemical testing was undertaken by a laboratory with recognised (UKAS and MCERTS) accreditation for quality control.

4. GROUND CONDITIONS

4.1 Stratigraphy

4.1.1 Surface Covering

In general, each of the exploratory holes was excavated through a surface cover of either asphalt, asphalt overlying concrete or paving slabs over concrete, some 100mm to 200mm in total thickness.

4.1.2 Made Ground

Made ground, generally comprising gravelly to slightly gravelly slightly sandy clay and locally sandy gravel, was recorded to depths of between 0.30m and 0.90m below ground level. The gravel fraction comprised variable quantities of flint, crystalline rock, brick, concrete, chalk and ash-like material. Within borehole WS01, suspected asbestos cement fragments were also noted within the made ground soil between 0.35m and 0.70m depth.

4.1.3 River Terrace Deposits

Underlying the made ground, the investigation progressed into undisturbed slightly gravelly slightly sandy clay and slightly gravelly sandy clay deposits. The clay soils were generally recorded to be of firm consistency although locally soft soils were noted at depths of between 1.40m and 2.00m below ground level. In general, the soils became stiff at greater depth. The gravel fraction comprised variable quantities of flint and chalk, with ironstone gravel also noted at times.

These deposits, considered to represent the River Terrace Deposits indicated to underlie the site on BGS geological maps, continued to the full depth of most of the exploratory holes, and to a depth of 4.30m below ground level within borehole WS02.

4.1.4 White Chalk Subgroup

Beneath the River Terrace Deposits, borehole WS02 progressed into chalk deposits which continued to the full depth of 5.00m below ground level.

These deposits are considered to represent the White Chalk Subgroup indicated to underlie the River Terrace Deposits on BGS geological maps.

4.2 Stability

Instability was recorded locally within the soils encountered, likely exacerbated by the presence of groundwater.

4.3 Groundwater Conditions

Groundwater was recorded at depths of between 1.00m and 1.90m on completion of the exploratory holes.

Longer term groundwater monitoring is currently ongoing, and the results will be issued under separate cover.

5. GEOTECHNICAL ASSESSMENT

The geotechnical assessment has been prepared in connection with the development proposals shown on the drawings included in Appendix A.

In summary, the proposed development is to comprise the construction of an additional storey to the existing residential building, as well as the provision of a three-storey rear extension.

At the time of writing, no details were available concerning the specific loads likely to be applied to the foundations.

5.1 Foundations

5.1.1 Soil Shrinkage/Heave Potential

The fine-grained soils of the River Terrace Deposits have been classified as clays, and with plasticity indices in the range of 8% to 29%, the soils may be expected to exhibit up to a medium volume change potential.

It is recommended that the design of precautions against shrinkage and heave for any new foundation system (spread footings, and ground beams etc.) should assume a medium volume change potential for the fine-grained River Terrace Deposit soils and take into account current guidance such as that given by the Building Research Establishment (BRE)[4] or the National House Builders Council (NHBC)[5].

Whilst this report has been prepared to provide advice to assist designers in undertaking detailed design, the report itself does not represent a detailed design statement. Detailed foundation design, including assessment of foundation type, minimum founding depths for spread foundations, and requirements for placement of void formers et cetera, should take into account the findings of this report and the presence of existing trees and any proposed tree planting that may affect foundation design. It is recommended that the species and maturity of the existing trees in the areas of development should be confirmed prior to finalising the foundation design. Information on any proposed planting schemes that may affect foundation design should also be provided to the structural engineers responsible for the foundation design.

5.1.2 Spread Foundations

5.1.2.1 Foundation Depths for Spread Foundations

Foundations should be constructed to bear below soils that are likely to be affected by significant soil volume changes caused by seasonal changes in moisture content to avoid damage to foundations that could otherwise arise. In addition, all made ground and any soils disturbed by the construction or removal of any previously existing foundations or services should be regarded as being variable in nature and state of compaction and, as such, unsuitable as a founding medium for shallow footings. New footings should be constructed so as to bear below made ground/disturbed natural soils and soil subject to seasonal soil volume changes, whichever is the deeper, and onto undisturbed, competent, natural deposits. In this regard it is noted that locally soft soils were encountered to depths of between 1.70m and 2.00m below ground level in boreholes WS01 to WS03. These soils are not considered to be competent to carry the expected structural loads.

[4] www.bre.co.uk : BRE Digests 240, 241 and 242, Low rise buildings on shrinkable clay soils, parts 1, 2 and 3; and BRE Digest 298 , The influence of trees on house foundations in clay soils and BRE Digest 412, Desiccation in clay soils.
[5] http://www.nhbc.co.uk/ : NHBC Standards, Chapter 4.2.

Summary guidance on suitable minimum foundation depths to protect against the effects of seasonal soil volume changes is presented in the table below but designers undertaking detailed design of foundations should follow the detailed guidance such as that provided within Chapter 4.2 of the NHBC Standards.

Table 4. Indicative Minimum Foundation Depths

Tree Type	Water Demand of Tree	Tree Distance to Tree Height Ratio (D/H)									
		0.00	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.25
		Minimum Foundation Depth Required in Medium Volume Change Potential Soils (m)									
Broad Leaf	High	†			2.50	2.35	2.20	2.00	1.70	1.35	0.90*
	Moderate	2.00	1.85	1.70	1.60	1.45	1.30	1.15	0.90*	2.00	1.85
	Low	1.50	1.40	1.30	1.15	1.05	0.90*	0.90*	0.90*	1.50	1.40
Coniferous	High	†		2.30	1.95	1.60	1.25	0.90*	0.90*	0.90*	†
	Moderate	2.00	1.70	1.40	1.10	0.90*	0.90*	0.90	0.90*	2.00	1.70

* Minimum foundation depth required to protect against soil volume changes.
† Foundations deeper than 2.50m require specialist design to protect against soil volume changes.

Where specialist foundation design is required (foundation depths exceeding the maximum permitted by the guidance) then piled foundations are likely to be needed, though commercial considerations may also dictate that piled foundations may be more economic even in comparison with conventional spread foundations constructed to depths less than the maximum permitted by guidance. Further works including deep boreholes would be required if structural engineers or quantity surveyors decide that piled foundations should be adopted.

Details on the water demand and mature height of common trees is given within Table 3 of Chapter 4.2 of the NHBC standards which should be referred to when assessing minimum foundation depths required for the proposed development. A summary is provided in the table below.

Table 5. Indicative Summary of Water Demand and Mature Height of Common Trees

Tree Type	High Water Demand		Moderate Water Demand		Low Water Demand	
	Tree	Height (m)	Tree	Height (m)	Tree	Height (m)
Broad Leaf	Elm	18 – 24*	Acacia	18	Birch	14
	Oak	16 – 24*	Alder	18	Elder	10
	Poplar	15 – 28*	Apple	10	Fig	8
	Willow	16 – 24*	Ash	11 – 23*	Hazel	8
	Eucalyptus	18	Laurel	10	Holly	12
	Hawthorn	10	Beech	20	Honey Locust	14
			Blackthorn	8	Hornbeam	17
			Cherry	8 – 17*	Laburnum	12
			Chestnut	20 – 24*	Magnolia	9
			Lime	22	Mulberry	9
			Maple	8 – 18*	Tulip Tree	20
			Pear	12		

Tree Type	High Water Demand		Moderate Water Demand		Low Water Demand
			Plane	26	
			Plum	10	
			Sycamore	22	
			Tree of Heaven	20	
			Walnut	18	
			Whitebeam	12	
Coniferous	Cypress	18 – 20*	Cedar	20	
			Douglas Fir	20	
			Larch	20	
			Monkey Puzzle	18	
			Pine	20	
			Spruce	18	
			Wellingtonia	30	
			Yew	12	

* Dependent on particular species.

5.1.2.2 Bearing Capacity for Spread Foundations

For design purposes, a net allowable bearing capacity of 100kN/m^2 may be assumed for spread (pad or strip) foundations up to 1.50m across bearing within the River Terrace Deposits of at least firm consistency (Minimum shear strength of 50kN/m^2). This figure may be increased to 150kN/m^2 where River Terrace Deposits possessing a shear strength of at least 65kN/m^2 are consistently present beneath foundation formation levels. Such soils were encountered at depths of 2.0m, 2.1m, 1.8m and 1.3m within boreholes WS01, WS02, WS03 and WS04, respectively. The quoted bearing capacities are expected to limit settlement to less than 25mm.

In consideration of the variable strength of the soils, particularly given firm soils were encountered beneath stiff soils in borehole WS04, it is recommended that all foundation excavations should be inspected prior to pouring of concrete to ensure that the shear strength of the soils at formation level comply with the soil shear strengths adopted in design.

5.2 Ground Floors

In view of the variable thickness of made ground and the presence of soils of up to medium volume change potential, it is recommended that ground floors should be suspended.

Current guidance[6] suggests that ground bearing floor slabs may, however, be considered where:

1) All made ground is removed from beneath the building footprint;
2) The depth of foundations required to protect against seasonal soil volume changes close to trees is less than 1.5m; and
3) Further works demonstrate that close to the time of construction, no significant soil desiccation is present.

[6] http://www.nhbc.co.uk/ : NHBC Standards, Chapter 4.2.

Where the above criteria cannot be met ground floors should be suspended.

If ground bearing floors are adopted it is recommended that the potential for differential movement, both between the floor slab and walls and across the floor slab itself, should be anticipated. Such floors should be fully debonded from walls. Formations should be adequately proof rolled and any excessively soft materials excavated and replaced with a suitable, well graded granular fill. The depth of any fill should be limited to a maximum of 600mm unless placed to an engineering specification designed to limit internal settlement of the fill materials to a tolerance to be advised by the designer.

5.3 Groundwater

Groundwater was recorded between depths of 1.00m and 1.90m below ground level during the site works. It should be noted that water levels within the exploratory holes may not have equilibrated with the groundwater table at the time the readings were recorded and that groundwater levels should be expected to fluctuate seasonally. As previously mentioned, long term groundwater monitoring is currently ongoing, and the results will be issued under separate cover on completion of the monitoring period.

Given the depths at which soft soils were locally encountered, it should be expected that foundation excavations will extend below the groundwater table and that groundwater control will be required to maintain adequately dry working conditions and excavation stability.

The potential for perched groundwater to be present above the groundwater table, for example within the made ground etc, should not be overlooked. It is also possible that heavy precipitation during construction could lead to the ingress of perched groundwater or surface water run-off into excavations.

It is expected that pumping from sumps would be sufficient to control groundwater in excavations extending a shallow depth beneath the groundwater table, but it would be prudent to undertake trial pumping from proposed foundation depths to enable temporary dewatering systems to be appropriated designed.

5.4 Stability of Excavations

All made ground soils and soft natural soils exposed in excavations should be assumed to be unstable, even in the short term. Whilst firm, or better, fine-grained natural soils may remain stable for a short period of time if not subjected to surcharge loads (such as may be imposed by existing foundations, traffic or storage of materials), the stability of these deposits if left unsupported should be assumed to have the potential to deteriorate. All excavations should be suitably supported.

All excavations requiring human entry must be shored as necessary to conform to current best practice, as accepted by the Health and Safety Executive (HSE)[7]. Current legislation requires that where personnel access is required into any excavation a competent person must inspect excavation supports at the start of the working shift and at other specified times. No work should take place until the excavation is safe. Excavations should also be inspected after any event that may have affected their stability, such as a significant weather event, changes in surcharge loadings imposed by temporary storage of materials or changes in site traffic plans or alteration of support systems. Inspections should be formally recorded and any faults that are found should be corrected immediately.

Particular attention must be paid to ensuring the stability of the existing and nearby structures, services and neighbouring sites as well as the road frontages.

[7] Relevant guidance is given on the HSE website, www.hse.gov.uk

5.5 Aggressivity to Concrete

The aggressivity of the soils to concrete has been assessed in accordance with guidance published by the BRE[8].

In consideration of the soils encountered beneath the site it is considered that 'natural ground conditions' may be assumed for the purpose of assessing the aggressivity of the chemical environment for concrete classification (ACEC class). Given the occurrence of groundwater, 'mobile groundwater' conditions should be assumed.

The following table summarises the characteristic values indicated from the chemical analysis of the soils present beneath the site.

Table 6. Assessment of the Chemical Analysis of the Soil

	Characteristic Value	Design Sulfate Class	ACEC Classification
pH	7.7	-	-
Water Soluble Sulphate (mg/l as SO4) *	100	DS-1	AC-1

Notes: * Characteristic value rounded to nearest 100.

In accordance with the guidance, a DS-1 Design Sulfate Class and an AC-1 ACEC classification should be assumed for the design of concrete in contact with the ground.

[8] BRE Special Digest 1:2005 Concrete in Aggressive Ground.

6. QUANTITATIVE CONTAMINATION ASSESSMENT

6.1 Introduction

The risk assessment for the site considers the sources of contamination identified, the receptors that may be present in view of the development proposals and the contaminant pathways by which these may be linked.

A complete pollutant linkage is only deemed to exist where all three are present and a site is considered suitable for use where no complete pollutant linkages are identified.

Where a complete pollutant linkage is considered to be present, an assessment of the level of risk associated with the pollutant linkage has been carried out in line with published guidance[9].

The level of risk is determined using the risk matrix presented in the following table. Classifications of probability, consequence and risk are presented in Appendix D.

Table 7. Risk Assessment Matrix

		Probability			
		Very Low	**Low**	**Moderate**	**High**
Consequence	**Very Minor**	Negligible	Very Low	Low	Low/Moderate
	Minor	Very Low	Low	Low/Moderate	Moderate
	Moderate	Low	Low/Moderate	Moderate	High
	Severe	Low/Moderate	Moderate	High	Very High

6.2 Preliminary Conceptual Model

A copy of the preliminary conceptual model is presented in Appendix E.

6.3 Assessment Strategy

The design of the ground investigation considered the potential contaminant sources identified by the preliminary ground contamination risk assessment. The investigation strategy employed to assess the potential sources is detailed in the following table.

Table 8. Investigation Works Carried Out

Contaminant source	Exploratory Positions
Made ground from historical development and hardstanding	Sampling of made ground from exploratory holes evenly spatially distributed across the site and testing of samples of made ground for contaminants of concern.
Petroleum hydrocarbon contamination from former garage to the east of the site	Boreholes WS01, WS03 and WS04 towards the eastern boundary of the site (where services permitted) and testing of samples for petroleum hydrocarbons.

[9] Contaminated Land Risk Assessment: A guide to good practice, CIRIA C552, 2001.

6.4 Analysis of Contamination Test Results

6.4.1 Method of Assessment

For the assessment of risk to end users, comparison of the results of the laboratory testing has been made against published soil screening values (SSV) comprising the 'Suitable For Use Levels' (S4UL)[10] or, in lieu of an S4UL being developed for lead, the Category 4 Screening Level (C4SL)[11].

In view of the development proposal, the SSV utilised in this assessment are those calculated for the generic "Residential without homegrown produce" land use.

For the assessment of risk to controlled waters a qualitative assessment has been undertaken based upon the concentrations of contaminants recorded within the soil samples and the information obtained about the sensitivity of the underlying strata or nearby surface water receptors.

6.4.2 Heavy Metals & Polycyclic Aromatic Hydrocarbon (PAH) Compounds

The following table summarises the SSV along with the maximum and minimum concentrations of the heavy metals and PAH compounds tested for.

Table 9. Summary of Test Results – Heavy Metals and PAH Compounds

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Arsenic	40	5	9	19	< 2	0
Water Soluble Boron	11000	5	<LOD	<LOD	< 1	0
Cadmium	85	5	0.2	0.6	< 0.2	0
Chromium	910	5	18	22	< 2	0
Hexavalent Chromium	6	5	<LOD	<LOD	< 2	0
Copper	7100	5	12	90	< 4	0
Lead	310	5	19	3470	< 3	1
Mercury	56	5	<LOD	<LOD	< 1	0
Nickel	180	5	14	24	< 3	0
Selenium	430	5	<LOD	<LOD	< 3	0
Zinc	40000	5	43	348	< 3	0
Naphthalene	2.3	5	<LOD	<LOD	< 0.1	0
Acenaphthylene	2900	5	<LOD	<LOD	< 0.1	0
Acenaphthene	3000	5	<LOD	<LOD	< 0.1	0
Fluorene	2800	5	<LOD	<LOD	< 0.1	0
Phenanthrene	1300	5	<LOD	0.29	< 0.1	0
Anthracene	31000	5	<LOD	<LOD	< 0.1	0

[10] Nathanail, C.P, et al., The LQM/CIEH S4ULs for Human Health Risk Assessment, 2015, Land Quality Press, Nottingham. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3071.
[11] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination. Final Project Report, published by DEFRA, 2014.

Contaminant	SSV (mg/kg)	No. of Samples	Minimum Concentration (mg/kg)	Maximum concentration (mg/kg)	Limit of Detection (mg/kg)	No of exceedances
Fluoranthene	1500	5	0.31	0.91	< 0.1	0
Pyrene	3700	5	0.29	0.85	< 0.1	0
Benz(a)anthracene	11	5	0.14	0.59	< 0.1	0
Chrysene	30	5	0.15	0.58	< 0.1	0
Benzo(b)fluoranthene	3.9	5	0.17	0.85	< 0.1	0
Benzo(k)fluoranthene	110	5	<LOD	0.35	< 0.1	0
Benzo(a)pyrene	3.2	5	0.17	0.8	< 0.1	0
Indeno(123-cd)pyrene	45	5	<LOD	0.38	< 0.1	0
Dibenz(ah)anthracene	0.31	5	<LOD	<LOD	< 0.1	0
Benzo(ghi)perylene	40	5	<LOD	0.32	< 0.1	0

One of the samples of made ground tested (from TP01) recorded concentrations of lead significantly above the SSV.

The made ground across the site was visually similar, contained similar gravel materials, and was recorded to similar depths across the site. The sampling carried out to date is not sufficient to determine whether the made ground soils at TP01 represent a contamination "hot spot", or an outlier, compared to made ground elsewhere on the site.

As there is the possibility that equally high concentrations of lead may be present in the made ground away from the sampling locations, at this stage the concentrations present should be considered to pose an unacceptable risk to end users and it should be assumed that remedial works will be necessary within any areas of proposed soft landscaping, although it is noted that these are expected to be limited only to ancillary planting around the car parking area.

At the concentrations recorded, none of the heavy metals or PAH compounds would be expected to exhibit significant mobility within the soils and are therefore not considered to pose an unacceptable risk to controlled waters beneath the site.

6.4.3 Asbestos

Suspected asbestos cement materials were noted within the matrix of the made ground soils in borehole WS01. Screening of this material confirmed it to be fragments of chrysotile asbestos cement.

None of the other samples of the made ground that were screened recorded the presence of any asbestos materials.

The presence of asbestos within the made ground soils is considered to pose an unacceptable risk to end users and would also drive a requirement for remedial works within the areas of proposed soft landscaping.

6.4.4 Petroleum Hydrocarbons

The following table lists the SSV for petroleum hydrocarbon equivalent carbon weight fractions and BTEX compounds calculated for 1% organic content.

Table 10. SSV for petroleum hydrocarbon equivalent carbon weight fractions

Petroleum Hydrocarbon Fraction	SSV (mg/kg)	Petroleum Hydrocarbon Fraction	SSV (mg/kg)
Aliphatic EC 5-6	42	**Aromatic EC 5-7**	370
Aliphatic EC >6-8	100	**Aromatic EC >7-8**	560
Aliphatic EC >8-10	27	**Aromatic EC >8-10**	47
Aliphatic EC >10-12	130	**Aromatic EC >10-12**	250
Aliphatic EC >12-16	1100	**Aromatic EC >12-16**	1800
Aliphatic EC >16-35	65000	**Aromatic EC >16-21**	1900
Aliphatic EC >35-44	65000	**Aromatic EC >21-35**	1900
		Aromatic EC >35-44	1900

Whilst full speciation of the concentrations of petroleum hydrocarbons by aromatic and aliphatic fractions was not undertaken, the results of the testing undertaken can still be compared with the more stringent of the screening values for the respective equivalent carbon weight fraction and, where the concentration recorded is found to be lower, it can be reasonably concluded that no significant risk is present.

Five of the six samples tested for petroleum hydrocarbons did not record any detectable concentrations of petroleum hydrocarbons and the sixth sample, from WS03 at 0.50m, recorded petroleum hydrocarbons only in the non-volatile >C16 fractions and at concentrations significantly below the more conservative SSV for each equivalent carbon weight fraction.

The concentrations of petroleum hydrocarbons present are not considered to pose an unacceptable risk to end users or controlled waters.

6.4.5 Water Supply Pipework

Comparison of the test results for petroleum hydrocarbons and PAH compounds have been undertaken with the threshold value for PE water supply pipework[12].

Concentrations of individual PAH compounds above the threshold value of 0.5mg/kg were recorded in two of the samples of made ground. Protective pipework (e.g. barrier pipe) may therefore be required by the local water supply company.

It is strongly recommended that designers consult with the local water supply company to determine the specific water supply pipe material required to be used, or whether they require further laboratory testing and assessment specific to proposed routes of services.

6.5 Quantitative Contamination Risk Assessment

6.5.1 Contaminant Pathways Identified

The development is to comprise residential buildings together with ancillary areas of soft landscaping, around areas of car parking.

[12] Set out within Portsmouth Water Screening Criteria for the USE of PE Pipes, 18 November 2015

Pathways associated with gas and vapour intrusion into new buildings are considered to be valid, along with direct contact and dust related pathways. However, pathways associated with the consumption of home grown produce are not considered to be valid.

Should the proposed development plans be altered, a revised risk assessment may be required.

It is noted that an asbestos survey of existing structures and infrastructure[13] was beyond the brief of this report. The risk assessment assumes that, should asbestos be identified within buildings or infrastructure, any such materials will be managed in accordance with current legislation and guidance, to ensure this does not represent an ongoing risk to end users and, specifically, to ensure that further asbestos materials are not introduced into the underlying soils.

The site is underlain by River Terrace Deposits overlying the White Chalk Subgroup which are classed as a Secondary A Aquifer and Principal Aquifer, respectively. Although the site is not located within a SPZ, and is located within an urban area, pathways relating to controlled waters may be reasonably considered to be present.

6.5.2 Contamination Source Identified

The following source of contamination has been identified by the quantitative contamination risk assessment:

- Made ground soils containing asbestos cement fragments and concentrations of lead above screening values, and concentrations of PAH compounds exceeding the threshold value for PE water supply pipework.

6.5.3 Quantitative Conceptual Model

The quantitative conceptual model for the proposed development is presented in Appendix F.

[13] As defined under Section 5(a) of the Control of Asbestos Regulations, 2012.

6.6 Risks to Other Potential Receptors

All construction workers must undertake their own risk assessment, based upon the works to be carried out and the proposed method by which this will be achieved, in accordance with current health and safety legislation. Their assessment should take into account all available information about the site, including that present within this report.

Appropriate working procedures and PPE should be adopted to ensure the health and safety of the site operatives. Instruction should be given in the recognition of potentially hazardous materials. All site personnel should be appropriately briefed on the discovery strategy, presented below, and what actions they must take in the event that further evidence of contamination is identified or suspected.

6.7 Recommendations

As a complete pollutant linkage relating to end users has been identified at the site, it is considered that remedial measures will be required as part of the proposed development.

The remediation works to be adopted should be detailed within a separate remediation strategy, along with a verification plan. This should be produced once this risk assessment report has been reviewed and approved by the appropriate authority.

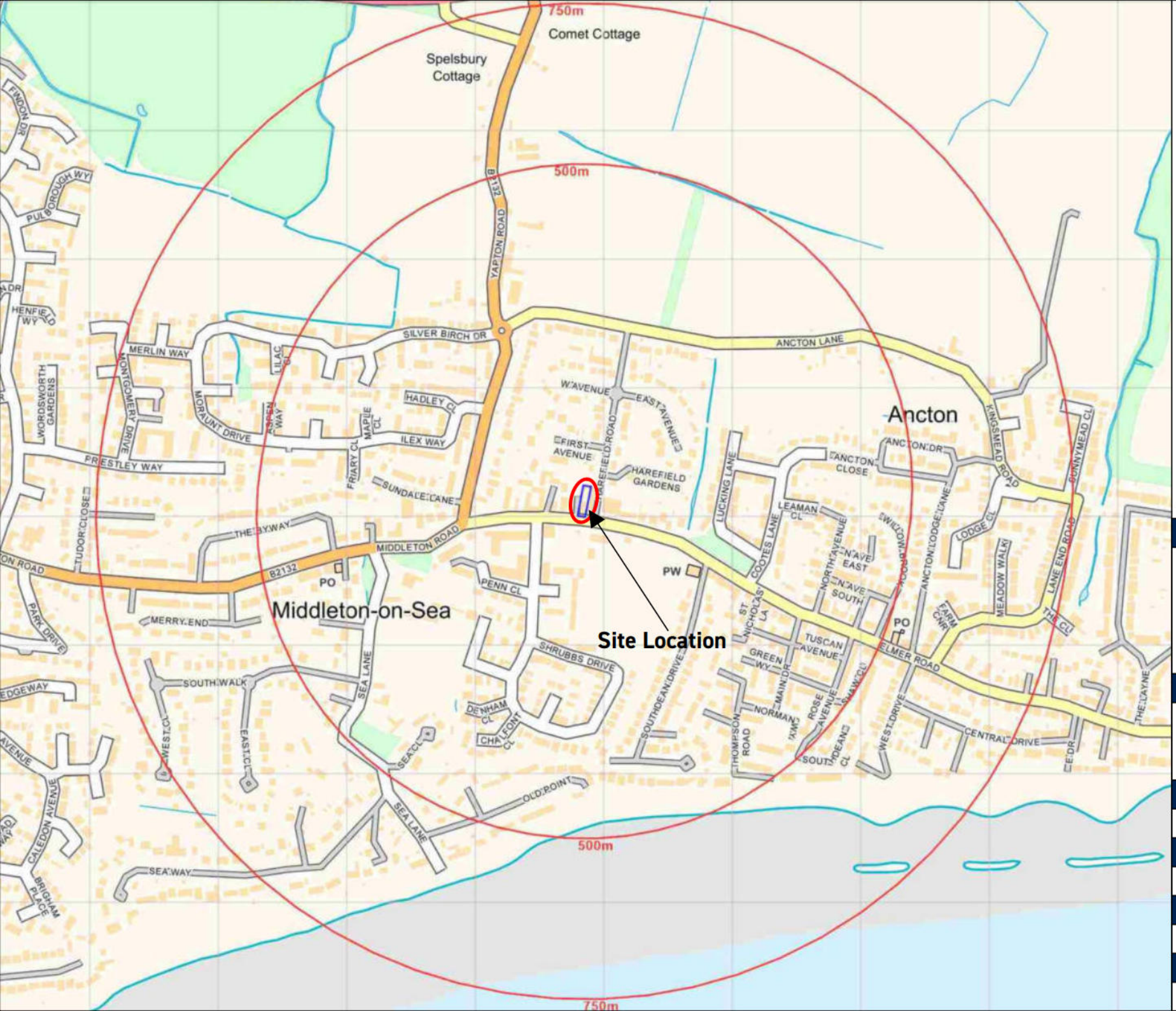
6.8 Regulatory Approval

It is recommended that this report is submitted to the relevant regulator in relation to the relevant conditions with respect to contaminated land. The report should also be submitted to any other relevant warrantor for the development.

The conclusions drawn in this report should be considered as provisional until such time as the report has been accepted and the relevant conditions have been discharged, though a remediation strategy is likely to be required to satisfy any pre-commencement panning or warrantor conditions.

FIGURES

Figure 1 Site Location Plan
Figure 2 Site Plan



N

ASHDOWN SITE INVESTIGATION

Head Office

Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG
contact@ashdownsi.co.uk

Site

Arundel Court
47 Elmer Road
Bognor Regis
West Sussex

Project Ref

P16949

Figure No

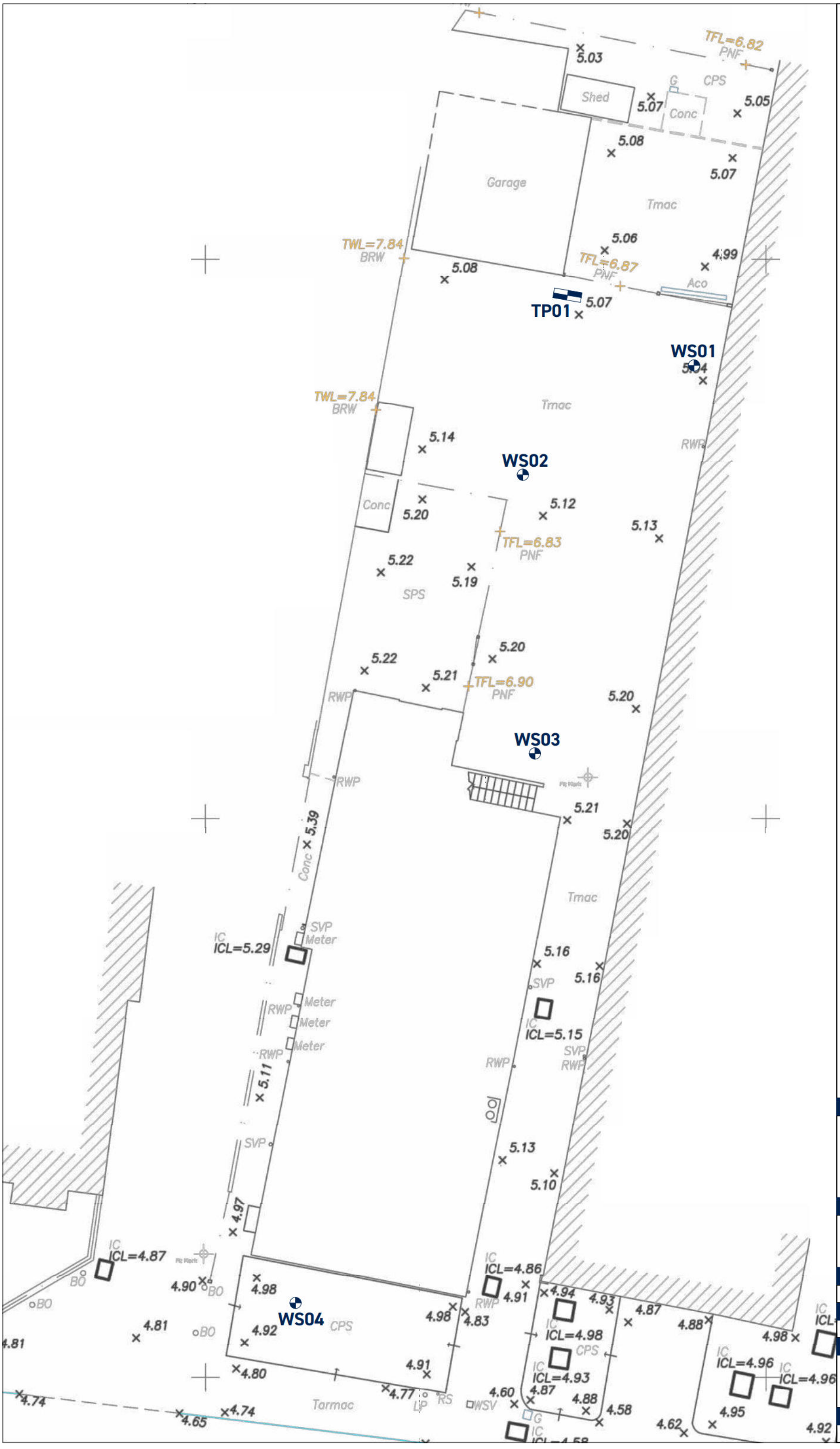
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Drawing Title

Site Location Plan

Scale

Not To Scale



ASHDOWN SITE INVESTIGATION

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47 Elmer Road
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West Sussex

Project Ref

P16949

Figure No

2

Drawing Title

Site Plan

Scale

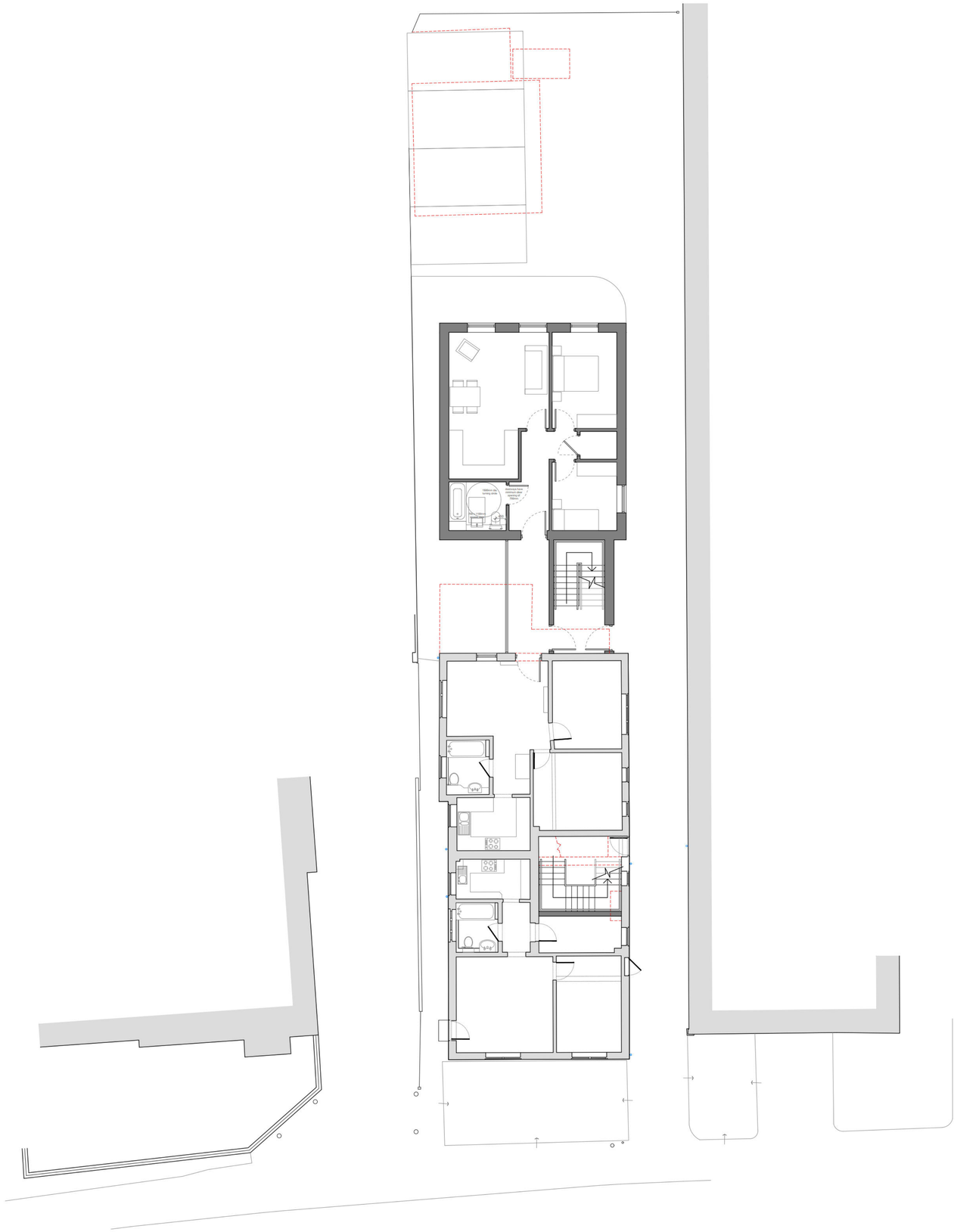
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APPENDIX A

Proposed Development Layout

NOTES

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DRAWING TITLE
Ground Floor Plan
As Proposed

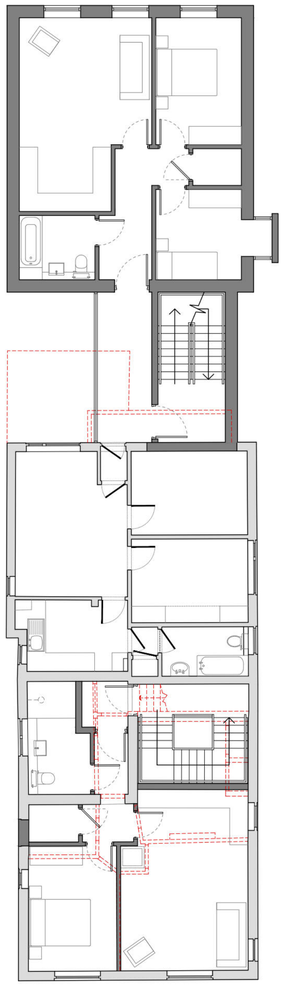
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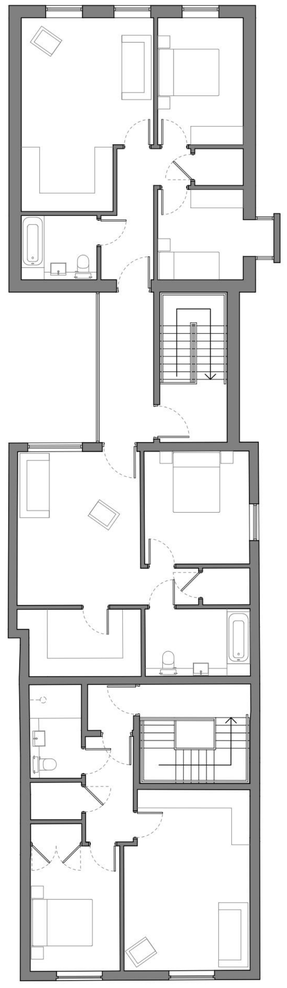
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24010	2.02	/

NOTES

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DRAWING TITLE
First & Second Floor Plans
As Proposed

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APPENDIX B

Explanatory Notes
Exploratory Hole Records
DPSH-B Dynamic Probe Records

ASHDOWN
SITE INVESTIGATION

EXPLANATORY NOTES

Symbols and abbreviations on Exploratory Hole Records

Samples

U	'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
Pi	Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D	Disturbed Sample
R	Root Sample
B	Bulk Disturbed Sample
W	Water Sample
ES	Environmental Suite (on older records may be referenced J T)

In Situ Testing

S	Standard penetration test (SPT): Using the split spoon sampler.
C	Standard Penetration Test (SPT): Using a solid cone instead of the sampler – conducted usually in coarse grained soils or weak rocks.
V	Shear Vane Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.
H	Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.
P	Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

CP	Cable Percussion Borehole
RC	Rotary Cored Borehole
WLS	Dynamic Sampler Borehole using windowless sampler tubes
WS	Dynamic Sampler Borehole using window sampler tubes
TP	Trial Pit excavated using mechanic excavator
HDP	Trial Pit excavated using hand tools

Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

In Situ Strength Testing

Standard penetration testing (SPT) carried out in accordance with BS EN ISO 22476-3:2005.

Continuous dynamic probe testing conducted using a super heavy DPSH-B (As defined by BS EN ISO 22476-2:2005) probing geometry. The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

Perth penetrometer tests carried out in accordance with Australian Standard AS 1289:6.3.3-1997, Method of Testing Soils for Engineering Purposes; no equivalent European or British Standard having been published to date.

Undrained shear strength determinations made in-situ using a Geonor hand shear vane or a hand penetrometer.

Testing to determine the in-situ California Bearing Ratio (CBR) of soils conducted at shallow depths using a hand-held Transport Research Laboratory (TRL) cone penetrometer.

Site Name: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Job Number: P16949

Start Date: 02/12/2024

End Date: 02/12/2024

Borehole Number: **WS01** Sheet 1 of 1

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
							0.00	Asphalt.
							0.10	MADE GROUND: Brown gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse crystalline rock with rare brick and flint.
	ES	0.30						
	ES	0.50					0.35	MADE GROUND: Brown and grey brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse concrete, brick, ash-like material and asbestos cement fragments. With occasional cobbles of concrete.
							0.70	Firm brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium flint and chalk. (River Terrace Deposits)
	ES	0.90						
	V	1.00		50				
	D	1.10						becoming green grey between 1.20m and 1.40m depth.
								becoming locally soft below 1.40m depth.
	D	1.80						
	V	2.00		30			2.00	Stiff orange brown and grey brown slightly gravelly slightly sandy CLAY with occasional pockets of sand. Gravel is subangular to subrounded fine to medium chalk and flint. (River Terrace Deposits)
	D	2.30						
								becoming locally very stiff below 2.70m depth.
	D	2.90						
							3.00	End of borehole at 3.00m

Remarks

Groundwater: Borehole dry on completion.

Stability: Borehole stable on completion.

Notes: n/a

Excavation Method: WLS

Borehole Diameter: Various

Made By: TM

Site Name: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Job Number: P16949

Start Date: 02/12/2024

End Date: 02/12/2024

Borehole Number: **WS02**

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
							0.00	Asphalt.
							0.04	Concrete.
	ES	0.30					0.15	MADE GROUND: Dark grey brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse brick and ash-like material.
							0.40	MADE GROUND: Brown and orange brown slightly gravelly slightly sandy silty clay. Gravel is subangular to subrounded fine to medium chalk and ash-like material.
	ES	0.80						
	V	1.00		40			0.90	Firm brown, orange brown and grey brown mottled slightly sandy CLAY with rare iron staining and gravel of ironstone. (River Terrace Deposits)
	H	1.20		50			1.20	Firm brown, orange brown and grey brown mottled slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium flint and chalk. (River Terrace Deposits)
	D	1.30						becoming locally soft between 1.50m and 1.90m depth.
	H	1.50		<25				
	D	1.90						
	H	1.90		25				
	V	2.00		40				
	H	2.10		100				becoming stiff below 2.10m depth.
	D	2.50						
	H	2.50		100				
	D	3.20					2.90	Stiff to very stiff orange brown and grey brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium flint and chalk. (River Terrace Deposits)
	D	3.90					3.80	Stiff brown, orange brown and grey brown slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to medium chalk. (River Terrace Deposits)
							4.30	Off white and occasionally light grey CHALK. (White Chalk Subgroup)
	D	4.80					5.00	End of borehole at 5.00m

Remarks

Groundwater: Groundwater recorded at 1.50m depth on completion.

Stability: Borehole cased to 2.00m depth.
Borehole collapsed to 4.00m depth on completion.

Notes: Standpipe installed to 4.00m depth; 4.00m to 1.00m slotted pipe with gravel surround; 1.00m to ground level plain pipe with bentonite seal; completed with end cap and security cover concreted flush with ground surface.

Excavation Method: WLS

Borehole Diameter: Various

Made By: TM

ASHDOWN

Site Name: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Job Number: P16949

Start Date: 02/12/2024

End Date: 02/12/2024

Borehole Number: **WS03**

Standpipe	Samples and In Situ Testing: Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe (0 5 10 15 20 25 30)	Legend	Depth	Stratum Description
							0.00	Asphalt.
							0.05	Concrete.
	ES	0.20					0.20	MADE GROUND: Sandy subangular to subrounded fine to coarse gravel of flint with rare brick and ash-like material.
	ES	0.50					0.30	MADE GROUND: Brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to coarse ash-like material and rare brick.
	D	0.90					0.70	Firm brown and orange brown slightly gravelly slightly sandy CLAY with rare iron staining. Gravel is subangular to subrounded fine to medium flint and ironstone. (River Terrace Deposits)
	H	0.90		40				
	V	1.00		60				
	H	1.20		50				becoming soft between 1.30m and 1.70m depth.
	ES	1.30						
	H	1.50		<25				
	D	1.70						becoming stiff below 1.80m depth.
	H	1.80		75				no sample recovery below 2.00m depth.
							3.00	End of borehole at 3.00m

Remarks

Groundwater: Groundwater recorded at 1.90m depth on completion.

Stability: Borehole collapsed to 2.00m depth on completion.

Notes: n/a

Excavation Method: WLS

Borehole Diameter: Various

Made By: TM

Site Name: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Job Number: P16949

Start Date: 02/12/2024

End Date: 02/12/2024

Borehole Number: **WS04**

Standpipe	Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result	Dynamic Probe 0 5 10 15 20 25 30	Legend	Depth	Stratum Description
							0.00	Paving slab.
							0.04	Concrete.
	ES	0.25					0.15	MADE GROUND: Brown slightly gravelly slightly sandy clay. Gravel is subangular to subrounded fine to medium ash-like material.
							0.30	Firm orange brown and grey brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)
	D	0.80						
	H	0.90		90				becoming locally stiff below 0.90m depth.
	V	1.00		130				
							1.30	Stiff brown, orange brown and grey brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium flint and chalk. (River Terrace Deposits)
	D	1.70						
							2.50	Firm, locally stiff, orange brown and grey brown slightly gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium chalk. (River Terrace Deposits)
	D	2.70						
							3.00	End of borehole at 3.00m

Remarks

Groundwater: Groundwater recorded at 1.00m depth on completion.

Stability: Borehole stable on completion.

Notes: n/a

Excavation Method: WLS

Borehole Diameter: Various

Made By: TM

Site Name: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Job Number: P16949

Start Date: 02/12/2024

End Date: 02/12/2024

Trial Pit Number: **TP01**

Sample/ Test Type	Samples and In Situ Testing: Depth From (m)	Depth To (m)	Test Result	Legend	Depth/ Reduced Level	Stratum Description
					0.00	Asphalt.
ES	0.15				0.10	MADE GROUND: Brown gravelly slightly sandy silty clay. Gravel is subangular to subrounded fine to coarse flint, crystalline rock and rare brick.
ES	0.30				0.20	MADE GROUND: Grey sandy silty angular to subrounded fine to coarse GRAVEL of flint and crystalline rock.
ES	0.60				0.35	MADE GROUND: Grey brown slightly gravelly slightly sandy silty clay. Gravel is subangular to subrounded fine to coarse flint with occasional brick and concrete. With occasional cobbles and boulders.
D	0.90				0.70	Orange brown and grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse flint and chalk. (River Terrace Deposits)
					0.96	End of trial pit at 0.96m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: Pit excavated to depths of between 0.95m and 0.97m, with an average pit depth of 0.96m.

Excavation Method: HDP

Pit Length: 1.02m

Pit Width: 0.34m

Made By: TM

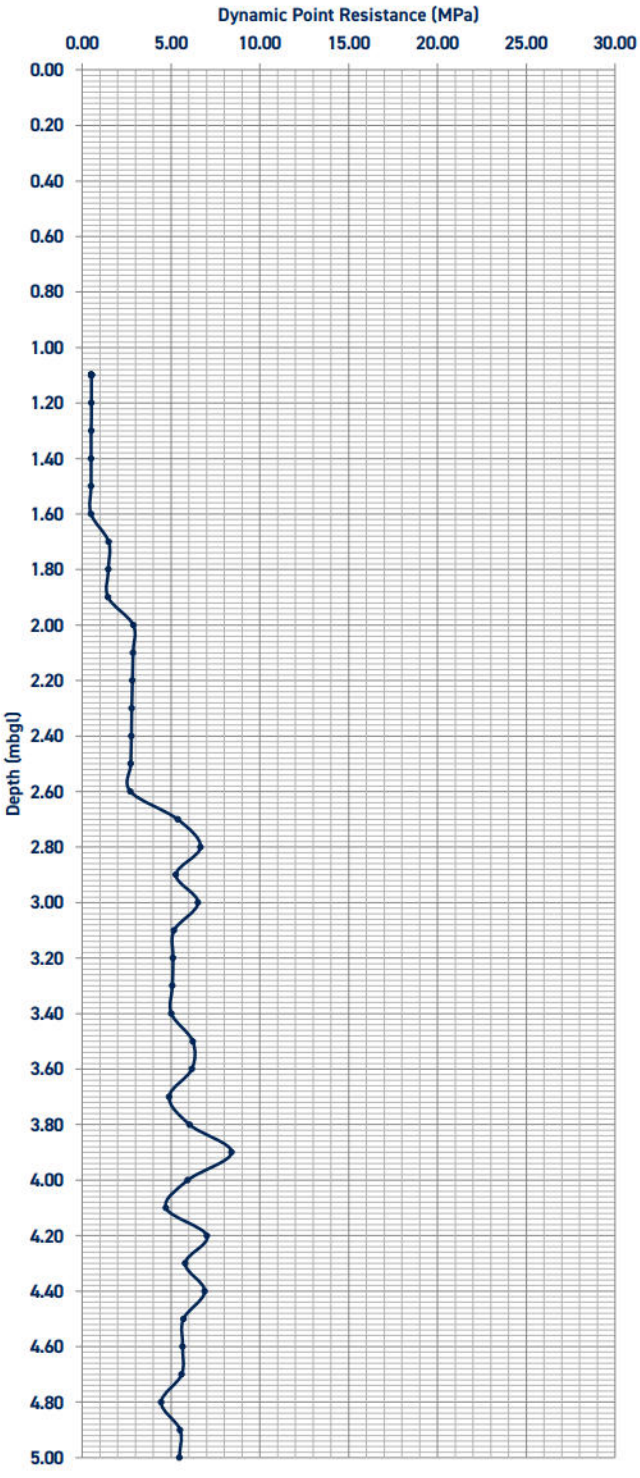
ASHDOWN SITE INVESTIGATION

DPSH-B DYNAMIC PROBE RECORD

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

Test Location Reference	WS01

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	0.33	0.30	0.62	0.53
1.20	0.33	0.30	0.62	0.52
1.30	0.33	0.30	0.62	0.52
1.40	0.33	0.30	0.62	0.51
1.50	0.33	0.30	0.62	0.50
1.60	0.33	0.30	0.62	0.50
1.70	1	0.10	1.87	1.49
1.80	1	0.10	1.87	1.48
1.90	1	0.10	1.87	1.46
2.00	2	0.05	3.74	2.89
2.10	2	0.05	3.74	2.86
2.20	2	0.05	3.74	2.83
2.30	2	0.05	3.74	2.80
2.40	2	0.05	3.74	2.77
2.50	2	0.05	3.74	2.74
2.60	2	0.05	3.74	2.72
2.70	4	0.03	7.48	5.38
2.80	5	0.02	9.34	6.66
2.90	4	0.03	7.48	5.28
3.00	5	0.02	9.34	6.53
3.10	4	0.03	7.48	5.17
3.20	4	0.03	7.48	5.13
3.30	4	0.03	7.48	5.08
3.40	4	0.03	7.48	5.03
3.50	5	0.02	9.34	6.23
3.60	5	0.02	9.34	6.17
3.70	4	0.03	7.48	4.89
3.80	5	0.02	9.34	6.06
3.90	7	0.01	13.08	8.41
4.00	5	0.02	9.34	5.95
4.10	4	0.03	7.48	4.72
4.20	6	0.02	11.21	7.02
4.30	5	0.02	9.34	5.80
4.40	6	0.02	11.21	6.90
4.50	5	0.02	9.34	5.70
4.60	5	0.02	9.34	5.66
4.70	5	0.02	9.34	5.61
4.80	4	0.03	7.48	4.45
4.90	5	0.02	9.34	5.52
5.00	5	0.02	9.34	5.47



Notes:

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m^2
E_{theor}	473 J
Energy Ratio	0.75
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

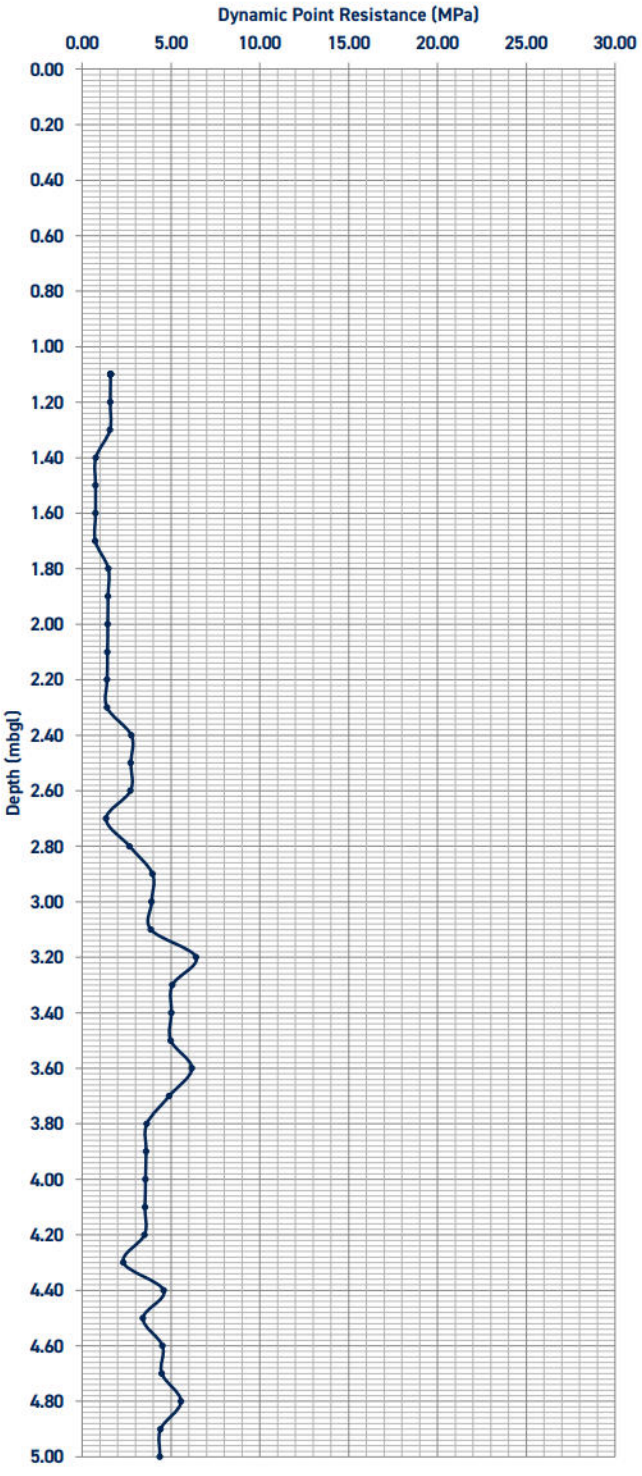
ASHDOWN SITE INVESTIGATION

DPSH-B DYNAMIC PROBE RECORD

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

Test Location Reference	WS02

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	1	0.10	1.87	1.60
1.20	1	0.10	1.87	1.58
1.30	1	0.10	1.87	1.56
1.40	0.5	0.20	0.93	0.77
1.50	0.5	0.20	0.93	0.76
1.60	0.5	0.20	0.93	0.76
1.70	0.5	0.20	0.93	0.75
1.80	1	0.10	1.87	1.48
1.90	1	0.10	1.87	1.46
2.00	1	0.10	1.87	1.45
2.10	1	0.10	1.87	1.43
2.20	1	0.10	1.87	1.42
2.30	1	0.10	1.87	1.40
2.40	2	0.05	3.74	2.77
2.50	2	0.05	3.74	2.74
2.60	2	0.05	3.74	2.72
2.70	1	0.10	1.87	1.35
2.80	2	0.05	3.74	2.66
2.90	3	0.03	5.61	3.96
3.00	3	0.03	5.61	3.92
3.10	3	0.03	5.61	3.88
3.20	5	0.02	9.34	6.41
3.30	4	0.03	7.48	5.08
3.40	4	0.03	7.48	5.03
3.50	4	0.03	7.48	4.98
3.60	5	0.02	9.34	6.17
3.70	4	0.03	7.48	4.89
3.80	3	0.03	5.61	3.64
3.90	3	0.03	5.61	3.60
4.00	3	0.03	5.61	3.57
4.10	3	0.03	5.61	3.54
4.20	3	0.03	5.61	3.51
4.30	2	0.05	3.74	2.32
4.40	4	0.03	7.48	4.60
4.50	3	0.03	5.61	3.42
4.60	4	0.03	7.48	4.52
4.70	4	0.03	7.48	4.49
4.80	5	0.02	9.34	5.56
4.90	4	0.03	7.48	4.41
5.00	4	0.03	7.48	4.38



Notes:

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m^2
E_{theor}	473 J
Energy Ratio	0.75
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

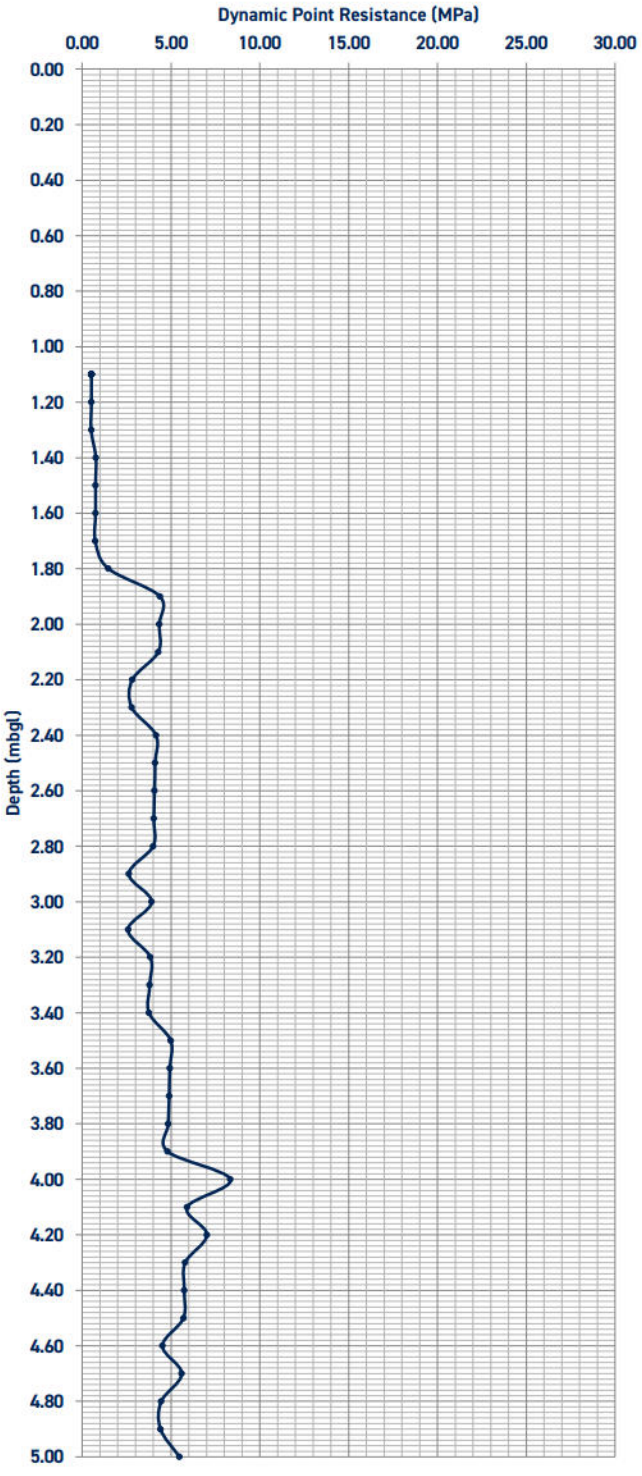
ASHDOWN SITE INVESTIGATION

DPSH-B DYNAMIC PROBE RECORD

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

Test Location Reference	WS03

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	0.33	0.30	0.62	0.53
1.20	0.33	0.30	0.62	0.52
1.30	0.33	0.30	0.62	0.52
1.40	0.5	0.20	0.93	0.77
1.50	0.5	0.20	0.93	0.76
1.60	0.5	0.20	0.93	0.76
1.70	0.5	0.20	0.93	0.75
1.80	1	0.10	1.87	1.48
1.90	3	0.03	5.61	4.38
2.00	3	0.03	5.61	4.34
2.10	3	0.03	5.61	4.29
2.20	2	0.05	3.74	2.83
2.30	2	0.05	3.74	2.80
2.40	3	0.03	5.61	4.16
2.50	3	0.03	5.61	4.12
2.60	3	0.03	5.61	4.08
2.70	3	0.03	5.61	4.04
2.80	3	0.03	5.61	4.00
2.90	2	0.05	3.74	2.64
3.00	3	0.03	5.61	3.92
3.10	2	0.05	3.74	2.59
3.20	3	0.03	5.61	3.84
3.30	3	0.03	5.61	3.81
3.40	3	0.03	5.61	3.77
3.50	4	0.03	7.48	4.98
3.60	4	0.03	7.48	4.94
3.70	4	0.03	7.48	4.89
3.80	4	0.03	7.48	4.85
3.90	4	0.03	7.48	4.81
4.00	7	0.01	13.08	8.34
4.10	5	0.02	9.34	5.90
4.20	6	0.02	11.21	7.02
4.30	5	0.02	9.34	5.80
4.40	5	0.02	9.34	5.75
4.50	5	0.02	9.34	5.70
4.60	4	0.03	7.48	4.52
4.70	5	0.02	9.34	5.61
4.80	4	0.03	7.48	4.45
4.90	4	0.03	7.48	4.41
5.00	5	0.02	9.34	5.47



Notes:

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m^2
E_{theor}	473 J
Energy Ratio	0.75
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

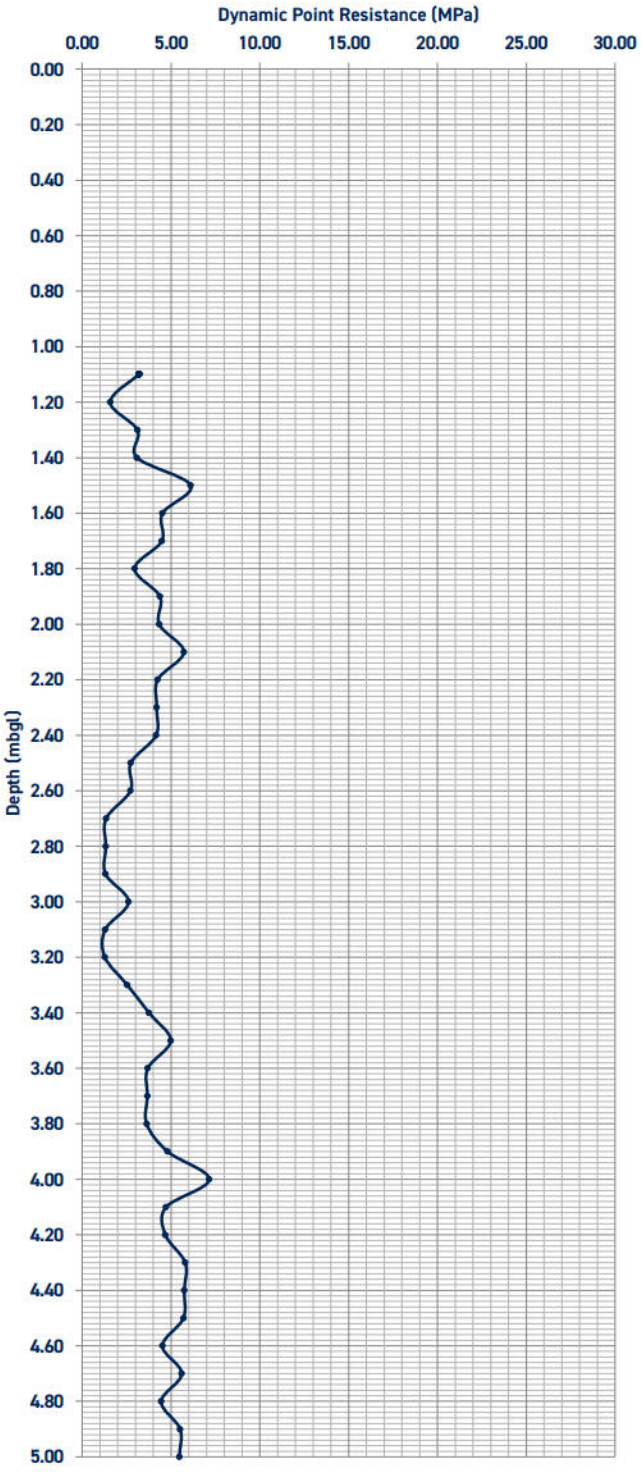
ASHDOWN SITE INVESTIGATION

DPSH-B DYNAMIC PROBE RECORD

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

Test Location Reference	WS04

Depth (mbgl)	Blows (per 100mm)	Average Penetration per Blow (m)	Unit Point Resistance (MPa)	Dynamic Point Resistance (MPa)
0.10				
0.20				
0.30				
0.40				
0.50				
0.60				
0.70				
0.80				
0.90				
1.00				
1.10	2	0.05	3.74	3.20
1.20	1	0.10	1.87	1.58
1.30	2	0.05	3.74	3.13
1.40	2	0.05	3.74	3.09
1.50	4	0.03	7.48	6.11
1.60	3	0.03	5.61	4.53
1.70	3	0.03	5.61	4.48
1.80	2	0.05	3.74	2.96
1.90	3	0.03	5.61	4.38
2.00	3	0.03	5.61	4.34
2.10	4	0.03	7.48	5.72
2.20	3	0.03	5.61	4.25
2.30	3	0.03	5.61	4.20
2.40	3	0.03	5.61	4.16
2.50	2	0.05	3.74	2.74
2.60	2	0.05	3.74	2.72
2.70	1	0.10	1.87	1.35
2.80	1	0.10	1.87	1.33
2.90	1	0.10	1.87	1.32
3.00	2	0.05	3.74	2.61
3.10	1	0.10	1.87	1.29
3.20	1	0.10	1.87	1.28
3.30	2	0.05	3.74	2.54
3.40	3	0.03	5.61	3.77
3.50	4	0.03	7.48	4.98
3.60	3	0.03	5.61	3.70
3.70	3	0.03	5.61	3.67
3.80	3	0.03	5.61	3.64
3.90	4	0.03	7.48	4.81
4.00	6	0.02	11.21	7.15
4.10	4	0.03	7.48	4.72
4.20	4	0.03	7.48	4.68
4.30	5	0.02	9.34	5.80
4.40	5	0.02	9.34	5.75
4.50	5	0.02	9.34	5.70
4.60	4	0.03	7.48	4.52
4.70	5	0.02	9.34	5.61
4.80	4	0.03	7.48	4.45
4.90	5	0.02	9.34	5.52
5.00	5	0.02	9.34	5.47



Notes:

Hammer Mass	63.5 kg
Fall Height	0.76 m
Cone Area	0.0019 m^2
E_{theor}	473 J
Energy Ratio	0.75
Anvil Mass	1 kg
Rod Mass	8.79 kg/m

APPENDIX C

Geotechnical Laboratory Test Results
Contamination Laboratory Test Results

ASHDOWN SITE INVESTIGATION

SOIL CLASSIFICATION SUMMARY

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

BH/TP No.	Depth (m)	Nat. Moist. Cont. (w %)	Equiv. Moist. Cont. (w_a %)	Atterberg Limits			Class'n	Cons. Index (I_c)	% passing 425 µm sieve	Visual Description of Sample
				W_l %	W_p %	I_p %				
WS01	1.10	28		51	22	29	ClH		98	Brown slightly gravelly slightly sandy CLAY. Gravel is fine flint.
WS02	1.30	23		46	19	27	ClM		100	Brown CLAY.
WS02	2.50	17		28	17	11	ClL		100	Brown slightly sandy CLAY.
WS02	3.20	12		21	13	8	ClL		46	Brown slightly gravelly sandy CLAY. Gravel is fine to medium flint and chalk.
WS03	1.70	23		40	17	23	ClM		100	Brown CLAY.
WS04	2.70	18		25	15	10	ClL		90	Brown mottled orange slightly gravelly slightly sandy CLAY. Gravel is fine to medium chalk and flint.
TP01	0.90	24		45	20	25	ClM		95	Brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse flint and ironstone.

Test Method: Classification Tests BS1377: Part 2: 1990: Method 4.4, 5.3 and 5.4

* Consistency index based on natural moisture content and not the equivalent moisture content.

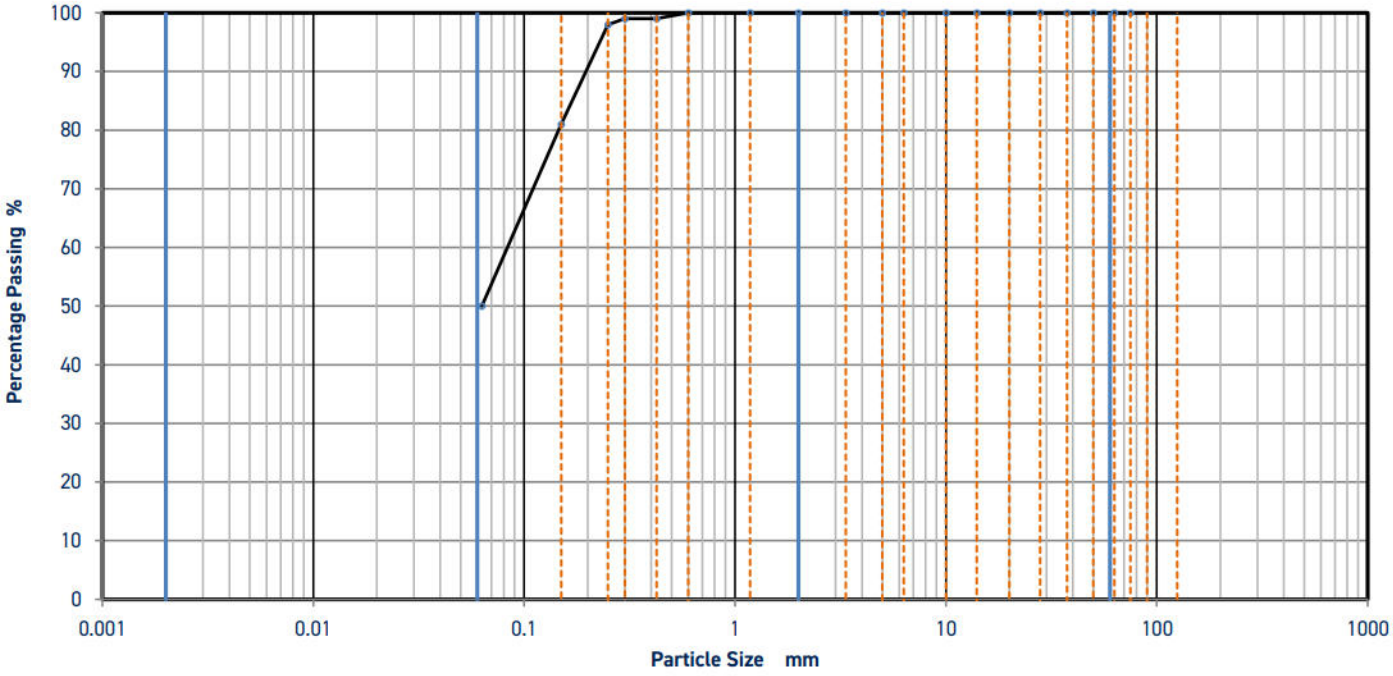
ASHDOWN SITE INVESTIGATION

PARTICLE SIZE DISTRIBUTION

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

Soil Description:	Sandy CLAY.	Borehole/Pit No.	WS04
Test Method	BS1377:Part2:1990, Clause 9.2	Depth (m)	1.70

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100	0.0200	
63	100	0.0060	
50	100	0.0020	
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	99		
0.25	98		
0.15	81		
0.063	50		

Dry Mass of sample (g)	501

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	50
Fines <0.063mm	50

Grading Analysis		
D_{100}	mm	0.600
D_{60}	mm	0.083
D_{30}	mm	
D_{10}	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Sheet No.: 1

Alex Bewick
Ashdown Site Investigations Ltd
Unit 3 The Grain Store
Ditchling Common Business Park
Ditchling Common
West Sussex
BN6 8SG

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
[redacted]

DETS Report No: 24-14666

Site Reference:	Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex
Project / Job Ref:	P16949 2598
Order No:	11965
Sample Receipt Date:	05/12/2024
Sample Scheduled Date:	05/12/2024
Report Issue Number:	1
Reporting Date:	11/12/2024

Authorised by:

[redacted]

Steve Knight
Customer Support 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.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
[redacted]

Soil Analysis Certificate						
DETS Report No: 24-14666	**Date Sampled**	02/12/24	02/12/24	02/12/24	02/12/24	02/12/24
Ashdown Site Investigations Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	**TP / BH No**	WS01	WS02	WS02	WS03	WS04
Project / Job Ref: P16949_2598	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11965	**Depth (m)**	2.30	1.90	4.80	0.90	2.70
Reporting Date: 11/12/2024	**DETS Sample No**	754249	754250	754251	754252	754253

Determinand	Unit	RL	Accreditation	(n)				
pH	pH Units	N/a	MCERTS	8.0	7.9	8.0	7.7	8.1
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	MCERTS	18	16	76	18	13
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	MCERTS	0.02	0.02	0.08	0.02	0.01

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
(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 - Sample Descriptions	
DETS Report No: 24-14666	
Ashdown Site Investigations Ltd	
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	
Project / Job Ref: P16949_2598	
Order No: 11965	
Reporting Date: 11/12/2024	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
754249	WS01	None Supplied	2.30	13.4	Light brown sandy clay
754250	WS02	None Supplied	1.90	18.8	Light brown clay
754251	WS02	None Supplied	4.80	18	Light grey clay with chalk
754252	WS03	None Supplied	0.90	17.6	Light brown clay
754253	WS04	None Supplied	2.70	14.3	Light brown sandy clay with chalk

Moisture content is part of procedure E003 & is not an accredited test

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-14666

Ashdown Site Investigations Ltd

Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Project / Job Ref: P16949_2598

Order No: 11965

Reporting Date: 11/12/2024

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

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List of HWOL Acronyms and Operators
DETS Report No: 24-14666
Ashdown Site Investigations Ltd
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex
Project / Job Ref: P16949_2598
Order No: 11965
Reporting Date: 11/12/2024

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym

Alex Bewick
Ashdown Site Investigations Ltd
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Derwentside Environmental Testing Services Ltd
Unit 1
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ME17 2JN
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DETS Report No: 24-14572

Site Reference:	Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex
Project / Job Ref:	P16949 2594
Order No:	11960
Sample Receipt Date:	04/12/2024
Sample Scheduled Date:	04/12/2024
Report Issue Number:	1
Reporting Date:	10/12/2024

Authorised by:

[redacted]

Steve Knight
Customer Support Manager

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

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Soil Analysis Certificate						
DETS Report No: 24-14572	**Date Sampled**	02/12/24	02/12/24	02/12/24	02/12/24	02/12/24
Ashdown Site Investigations Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	**TP / BH No**	WS01**	WS01	WS02	WS03	WS03
Project / Job Ref: P16949_2594	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11960	**Depth (m)**	0.50	0.90	0.30	0.50	1.30
Reporting Date: 10/12/2024	**DETS Sample No**	754031	754032	754033	754034	754035

Determinand	Unit	RL	Accreditation					(n)
Asbestos Screen (S)	N/a	N/a	ISO17025	Detected		Not Detected	Not Detected	
Sample Matrix (S)	Material Type	N/a	NONE	Chrysotile present in visible cement fragments				
Asbestos Type (S)	PLM Result	N/a	ISO17025	Chrysotile				
pH	pH Units	N/a	MCERTS	8.1		7.9	8.0	
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	290			214	
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.03			0.02	
Organic Matter (SOM)	%	< 0.1	MCERTS	2.2		2.7	2.3	
Arsenic (As)	mg/kg	< 2	MCERTS	12		14	10	
W/S Boron	mg/kg	< 1	NONE	< 1		< 1	< 1	
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.3		0.6	0.3	
Chromium (Cr)	mg/kg	< 2	MCERTS	19		20	18	
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2	< 2	
Copper (Cu)	mg/kg	< 4	MCERTS	26		31	19	
Lead (Pb)	mg/kg	< 3	MCERTS	42		90	26	
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	14		18	14	
Selenium (Se)	mg/kg	< 2	MCERTS	< 2		< 2	< 2	
Zinc (Zn)	mg/kg	< 3	MCERTS	97		348	60	

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
(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
Subcontracted analysis (S)

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Soil Analysis Certificate						
DETS Report No: 24-14572	**Date Sampled**	02/12/24	02/12/24	02/12/24		
Ashdown Site Investigations Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	**TP / BH No**	WS04	WS04	TP01		
Project / Job Ref: P16949_2594	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: 11960	**Depth (m)**	0.25	0.80	0.60		
Reporting Date: 10/12/2024	**DETS Sample No**	754036	754037	754038		

Determinand	Unit	RL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	Not Detected		Not Detected		
Sample Matrix (S)	Material Type	N/a	NONE					
Asbestos Type (S)	PLM Result	N/a	ISO17025					
pH	pH Units	N/a	MCERTS	9.6		7.8		
Total Sulphate as SO_4	mg/kg	< 200	MCERTS	581				
Total Sulphate as SO_4	%	< 0.02	MCERTS	0.06				
Organic Matter (SOM)	%	< 0.1	MCERTS	1		2.6		
Arsenic (As)	mg/kg	< 2	MCERTS	9		19		
W/S Boron	mg/kg	< 1	NONE	< 1		< 1		
Cadmium (Cd)	mg/kg	< 0.2	MCERTS	0.2		0.4		
Chromium (Cr)	mg/kg	< 2	MCERTS	20		22		
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2		< 2		
Copper (Cu)	mg/kg	< 4	MCERTS	12		90		
Lead (Pb)	mg/kg	< 3	MCERTS	19		3470		
Mercury (Hg)	mg/kg	< 1	MCERTS	< 1		< 1		
Nickel (Ni)	mg/kg	< 3	MCERTS	16		24		
Selenium (Se)	mg/kg	< 2	MCERTS	< 2		< 2		
Zinc (Zn)	mg/kg	< 3	MCERTS	43		123		

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

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Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 24-14572	**Date Sampled**	02/12/24	02/12/24	02/12/24	02/12/24	02/12/24
Ashdown Site Investigations Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	**TP / BH No**	WS01**	WS02	WS03	WS04	TP01
Project / Job Ref: P16949_2594	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11960	**Depth (m)**	0.50	0.30	0.50	0.25	0.60
Reporting Date: 10/12/2024	**DETS Sample No**	754031	754033	754034	754036	754038

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	0.26	0.29	< 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	0.33	0.59	0.91	0.37	0.31
Pyrene	mg/kg	< 0.1	MCERTS	0.30	0.54	0.85	0.36	0.29
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.16	0.25	0.59	0.21	0.14
Chrysene	mg/kg	< 0.1	MCERTS	0.16	0.27	0.58	0.20	0.15
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.19	0.26	0.85	0.26	0.17
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.35	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.17	0.25	0.80	0.28	0.17
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.38	0.14	< 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	< 0.1	0.32	< 0.1	< 0.1
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	2.4	5.9	1.8	< 1.6

(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 - EPH Banded (Type F)						
DETS Report No: 24-14572	**Date Sampled**	02/12/24	02/12/24	02/12/24	02/12/24	02/12/24
Ashdown Site Investigations Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	**TP / BH No**	WS01**	WS01	WS03	WS03	WS04
Project / Job Ref: P16949_2594	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: 11960	**Depth (m)**	0.50	0.90	0.50	1.30	0.25
Reporting Date: 10/12/2024	**DETS Sample No**	754031	754032	754034	754035	754036

Determinand	Unit	RL	Accreditation	(n)				
EPH (>C8 - C10) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH (>C10 - C12) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH (>C12 - C16) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	< 1	< 1	< 1
EPH (>C16 - C21) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1	< 1	4	< 1	1
EPH (>C21 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	< 6	< 6	20	< 6	< 6
EPH (C8 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	< 6	< 6	24	< 6	< 6

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Soil Analysis Certificate - EPH Banded (Type F)						
DETS Report No: 24-14572	**Date Sampled**	02/12/24				
Ashdown Site Investigations Ltd	**Time Sampled**	None Supplied				
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	**TP / BH No**	WS04				
Project / Job Ref: P16949_2594	**Additional Refs**	None Supplied				
Order No: 11960	**Depth (m)**	0.80				
Reporting Date: 10/12/2024	**DETS Sample No**	754037				

Determinand	Unit	RL	Accreditation					
EPH (>C8 - C10) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1				
EPH (>C10 - C12) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1				
EPH (>C12 - C16) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1				
EPH (>C16 - C21) : EH_1D_Total	mg/kg	< 1	MCERTS	< 1				
EPH (>C21 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	< 6				
EPH (C8 - C40) : EH_1D_Total	mg/kg	< 6	MCERTS	< 6				

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Unit 1, Rose Lane Industrial Estate
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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 24-14572	
Ashdown Site Investigations Ltd	
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex	
Project / Job Ref: P16949_2594	
Order No: 11960	
Reporting Date: 10/12/2024	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
754031	WS01**	None Supplied	0.50	17.4	Brown sandy clay with stones and brick
754032	WS01	None Supplied	0.90	15.5	Light brown clay
754033	WS02	None Supplied	0.30	18.7	Brown sandy loam
754034	WS03	None Supplied	0.50	17.6	Light brown clay with stones
754035	WS03	None Supplied	1.30	16.3	Light brown sandy clay
754036	WS04	None Supplied	0.25	14	Light brown sandy clay
754037	WS04	None Supplied	0.80	16.2	Light brown clay
754038	TP01	None Supplied	0.60	19.9	Brown clay

Moisture content is part of procedure E003 & is not an accredited test

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 24-14572

Ashdown Site Investigations Ltd

Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Project / Job Ref: P16949_2594

Order No: 11960

Reporting Date: 10/12/2024

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

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
[redacted]

List of HWOL Acronyms and Operators
DETS Report No: 24-14572
Ashdown Site Investigations Ltd
Site Reference: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex
Project / Job Ref: P16949_2594
Order No: 11960
Reporting Date: 10/12/2024

Acronym	Description
HS	Headspace analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up - e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
2D	GC-GC - Double coil gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics only
AR	Aromatics only
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +)
+	Operator to indicate cumulative eg. EH+HS_Total or EH_CU+HS_Total

Det - Acronym
EPH Banded (C10 - C12) - EH_1D_Total
EPH Banded (C12 - C16) - EH_1D_Total
EPH Banded (C16 - C21) - EH_1D_Total
EPH Banded (C21 - C40) - EH_1D_Total
EPH Banded (C8 - C10) - EH_1D_Total
EPH Banded (C8 - C40) - EH_1D_Total

APPENDIX D

Classification of Probability, Consequence and Risk

ASHDOWN
SITE INVESTIGATION

Probability Of Risk Being Realised	
Classification	**Definition**
High	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Moderate	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Very Low	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Consequence Of Risk Being Realised		
Classification	**Category**	**Definition**
Severe	Human Health	Short term (acute) risk to human health likely to result in "significant harm" as defined by the Environment Protection Act 1990, Part IIA.
	Controlled Waters	Short term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource.
	Property	Catastrophic damage to buildings/property.
	Ecological Systems	A short term risk to a particular ecosystem or organisation forming part of such ecosystem.
Moderate	Human Health	Chronic damage to Human Health.
	Controlled Waters	Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution).
	Ecological System	A significant change in a particular ecosystem or organism forming part of such ecosystem.
Minor	Controlled Waters	Pollution of non-sensitive water resources.
	Property	Significant damage to crops, buildings, structures and services.
	Ecological Systems	Damage to sensitive buildings/structures/services or the environment.
Very Minor	Human Health	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing, etc).
	Property	Easily repairable effects of damage to buildings, structures and services.
	Project	Harm, although not necessarily significant harm, which may result in a financial loss or expenditure to resolve.

Risk Classification Definitions	
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the long term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from an identified hazard, but there is a low likelihood of this hazard occurring and if realised, harm would at worst normally be mild.
Very Low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

APPENDIX E

Preliminary Conceptual Model

ASHDOWN SITE INVESTIGATION

PRELIMINARY CONCEPTUAL MODEL

Site: Arundel Court, 47 Elmer Road, Elmer, Bognor Regis, West Sussex **Project Ref:** P16949

Potential Source	Potential Receptor	Potential Contaminants	Potential Pathway	Complete Linkage Present?	Probability	Consequence	Risk
Made ground from historical development and hardstanding	End Users	Asbestos, Heavy Metals and PAH Compounds	Dermal contact with soil and dust (indoor & outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Ingestion of soil and indoor dust	Yes	P1: Very Low	C3: Moderate	Low
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Inhalation of soil vapours	Identified contaminants do not pose a risk via this pathway			N/A
			Inhalation of soil gases/ Risk of explosion	Identified contaminants do not pose a risk via this pathway			N/A
	End Users (via Water Supply Pipework)	PAH Compounds	Contamination of incoming services	Yes	P2: Low	C3: Moderate	Low/Moderate
	Groundwater	Heavy Metals and PAH Compounds	Migration to groundwater	Yes	P1: Very Low	C1: Very Minor	Negligible
Petroleum hydrocarbon contamination from former garage to the east of the site	End Users	Petroleum Hydrocarbons	Dermal contact with soil and dust (indoor & outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Ingestion of soil and indoor dust	Yes	P1: Very Low	C3: Moderate	Low
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Inhalation of soil vapours	Yes	P1: Very Low	C3: Moderate	Low
			Inhalation of soil gases/ Risk of explosion	Identified contaminants do not pose a risk via this pathway			N/A
	End Users (via Water Supply Pipework)	Petroleum Hydrocarbons	Contamination of incoming services	Yes	P2: Low	C3: Moderate	Low/Moderate
	Groundwater	Petroleum Hydrocarbons	Migration to groundwater	Yes	P1: Very Low	C2: Minor	Very Low

APPENDIX F

Quantitative Conceptual Model

ASHDOWN SITE INVESTIGATION

QUANTITATIVE CONCEPTUAL MODEL

Site: Arundel Court, 47 Elmer Road, Elmer, Bognor Regis, West Sussex **Project Ref:** P16949

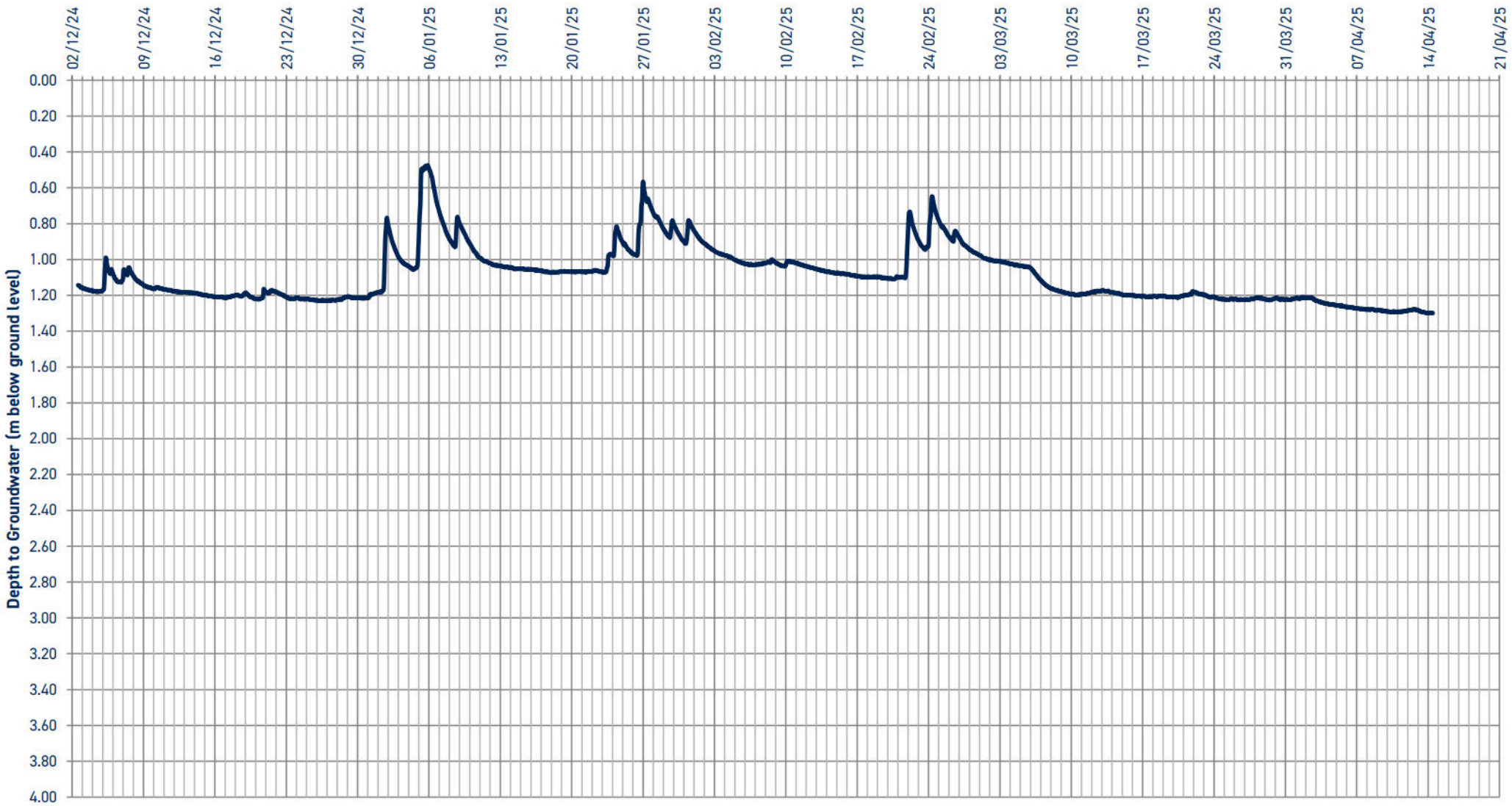
Source	Receptor	Contaminants	Pathway	Complete Linkage Present?	Probability	Consequence	Risk
• Made ground soils containing asbestos cement fragments and concentrations of lead above screening values. and concentrations of PAH compounds exceeding the threshold value for PE water supply pipework.	End Users	Asbestos and Lead	Dermal contact with soil and dust (indoor & outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Ingestion of soil and indoor dust	Yes	P1: Very Low	C3: Moderate	Low
			Consumption of home-grown produce and attached soil	No private gardens proposed			N/A
			Inhalation of soil dust (indoor and outdoor)	Yes	P1: Very Low	C3: Moderate	Low
			Inhalation of soil vapours	Identified contaminants do not pose a risk via this pathway			N/A
			Inhalation of soil gases/ Risk of explosion	Identified contaminants do not pose a risk via this pathway			N/A
	End Users (via Water Supply Pipework)	PAH Compounds	Contamination of incoming services	Yes	P2: Low	C3: Moderate	Low/Moderate
	Groundwater		Migration to groundwater	No contaminants present at concentrations posing risk to groundwater			N/A

ASHDOWN SITE INVESTIGATION

GROUNDWATER MONITORING

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Project Ref: P16949



WS02

ASHDOWN
SITE INVESTIGATION

IN SITU INFILTRATION TEST REPORT

ARUNDEL COURT
47 ELMER ROAD
BOGNOR REGIS
WEST SUSSEX

PROJECT REFERENCE: P16949

REPORT REFERENCE: R16515

Report Beneficiary: Sussex Develop & Build Ltd

Document Control				
Issue No.	**Status**	**Issue Date**	**Notes**	
1	Final	20th December 2024		
Report Section			**Prepared By**	**Approved By**
In Situ Infiltration Report			Adam Cormack HNC FGS	Steven McSwiney BA mod Geol MSc FGS

Limitations

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FIGURES AND APPENDICES

Figure 1 Site Location Plan
Figure 2 Site Plan
Explanatory Notes
Exploratory Hole Record
Trial Pit Infiltration Test Results

1. INTRODUCTION

Ashdown Site Investigation Ltd was requested to undertake in situ infiltration testing and groundwater monitoring at Arundel Court, Elmer Road, Bognor Regis, West Sussex to assist others with the design of a sustainable drainage system.

The specific objectives of the works were to:

a) Investigate the shallow ground and groundwater conditions at the exploratory hole test location; and
b) Undertake in situ infiltration testing and provide calculated infiltration rates to assist others with the drainage design.

A standpipe was also installed as the site to facilitate winter groundwater monitoring as part of broader ground investigation works conducted at the site. The results of the groundwater monitoring will be reported under separate cover.

The scope of the works covered by this report, and the terms and conditions under which they were undertaken, were set out within the offer letter Q14505, dated 17th September 2024. The instruction to proceed was received from the client, Sussex Develop & Build Ltd.

2. SITE CONTEXT

2.1 Site Location

The site is located on the northern side of Elmer Road, Bognor Regis, West Sussex, and is centred on the approximate Ordnance Survey national grid reference 497569, 100423. A site location plan and site plan are presented as Figure 1 and Figure 2, respectively.

2.2 Geological Setting

2.2.1 Expected Geology and Aquifer Designation

The stratigraphic succession that may be expected to underlie the site has been established by reference to British Geological Survey (BGS) mapping and the BGS Lexicon of Named Rock Units. The expected stratigraphy is presented in the following table.

Table 1. Expected Strata and Aquifer Designation

Type	Stratum	Aquifer Designation
Superficial	River Terrace Deposits	Secondary A Aquifer
Bedrock	Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) (White Chalk Subgroup)	Principal Aquifer

The River Terrace Deposits generally comprise well graded sandy fine to coarse gravel. Locally sand or gravel strata may predominate. Lenses of clay, silt and localised peat may be present. Gravels normally include a high proportion of subangular flint and chert and Lower Greensand rock types.

Areas denoted as Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) are where the White Chalk Subgroup deposits cannot be differentiated into their various formations. In this area the White Chalk Subgroup comprises chalk with flints. The Subgroup contains discrete marl seams, nodular chalk and flint seams throughout. The formation is of Maastrichtian to Cenomanian age (66 to 100.5 million years old; Late Cretaceous). The subgroup is recorded by the BGS to range in thickness up to 470 to 515m in the Hampshire/Sussex Area.

2.2.2 Groundwater Source Protection Zones (SPZ)

The Environment Agency defines SPZs as those areas where groundwater supplies are at risk from potentially polluting activities and accidental releases of pollutants. SPZs are primarily a policy tool used to control activities close to water supplies intended for human consumption.

The site does not lie within a SPZ.

3. SITE WORKS

To enable in situ infiltration testing to be undertaken a single hand dug trial pit, denoted TP01, was hand excavated to an average depth of 0.96m below ground level. The intrusive work was carried out on 2nd December 2024. The exploratory hole location is shown on Figure 2.

Falling head soakage testing was undertaken in the trial pit in general accordance with the test methodology given by BRE guidance[1], with the testing limited to a single day.

Descriptions of the strata encountered and comments on groundwater conditions are shown in the exploratory hole record, which is appended to this report, together with explanatory notes to assist in its interpretation. The results of the in situ infiltration testing are also appended.

[1] Section 3.2.3 of Building Research Establishment (BRE) Digest 365, 2016.

4. GROUND CONDITIONS

4.1 Stratigraphy

4.1.1 Surface Covering

The trial pit was initially excavated through a surface cover of asphalt some 100mm in thickness.

4.1.2 Made Ground

Made ground was encountered beneath the asphalt extending to a depth of 0.70m below ground level; the made ground generally comprising gravelly clay and sandy silty gravel. The gravel content comprised of varying quantities of brick, concrete, flint and crystalline rock-like material.

4.1.3 River Terrace Deposits

Underlying the made ground, the investigation progressed into undisturbed slightly gravelly slightly sandy silty clay soils which extended to the full depth of the trial pit. The gravel content consisted of fine to coarse flint and chalk.

These deposits are considered to represent the River Terrace Deposits indicated to underlie the site on BGS geological maps.

4.2 Groundwater Conditions and Stability

The trial pit remained dry and stable throughout the excavation process.

It should be noted that water levels may not have equilibrated with the groundwater table at the time the readings were recorded and that groundwater levels should be expected to fluctuate seasonally. Groundwater monitoring is currently ongoing, and the results will be issued under separate cover on completion of the monitoring period.

5. STORMWATER INFILTRATION SYSTEMS

In-situ infiltration testing[2] was carried out in trial pit TP01. From the test results calculations were made to determine the infiltration rate that could be expected for infiltration systems constructed into the underlying soils.

During the test performed the water level within the test pit did not fall below 25% of the initial test depth and calculation of the soil infiltration rate in accordance with the BRE digest was not possible. The soil infiltration rate has therefore been calculated by dividing the volume of water lost during the test by the product of the average surface area of the trial pit in contact with water during the test period and the test duration in seconds.

The infiltration rate was derived from the test is summarised on the following table.

Table 2. Calculated Infiltration Rates

Exploratory Hole	Top of Response Zone (m bgl)	Bottom of Response Zone (m bgl)	Stratum	Infiltration Rate (f) (m/sec)
TP01 Test 1	0.50	0.96*	Made Ground / River Terrace Deposits	6.31×10^{-6}

*Average pit depth

The value 'f' is equivalent to the soil infiltration coefficient 'q' quoted in the Construction Industry Research and Information Association (CIRIA) Report 156.

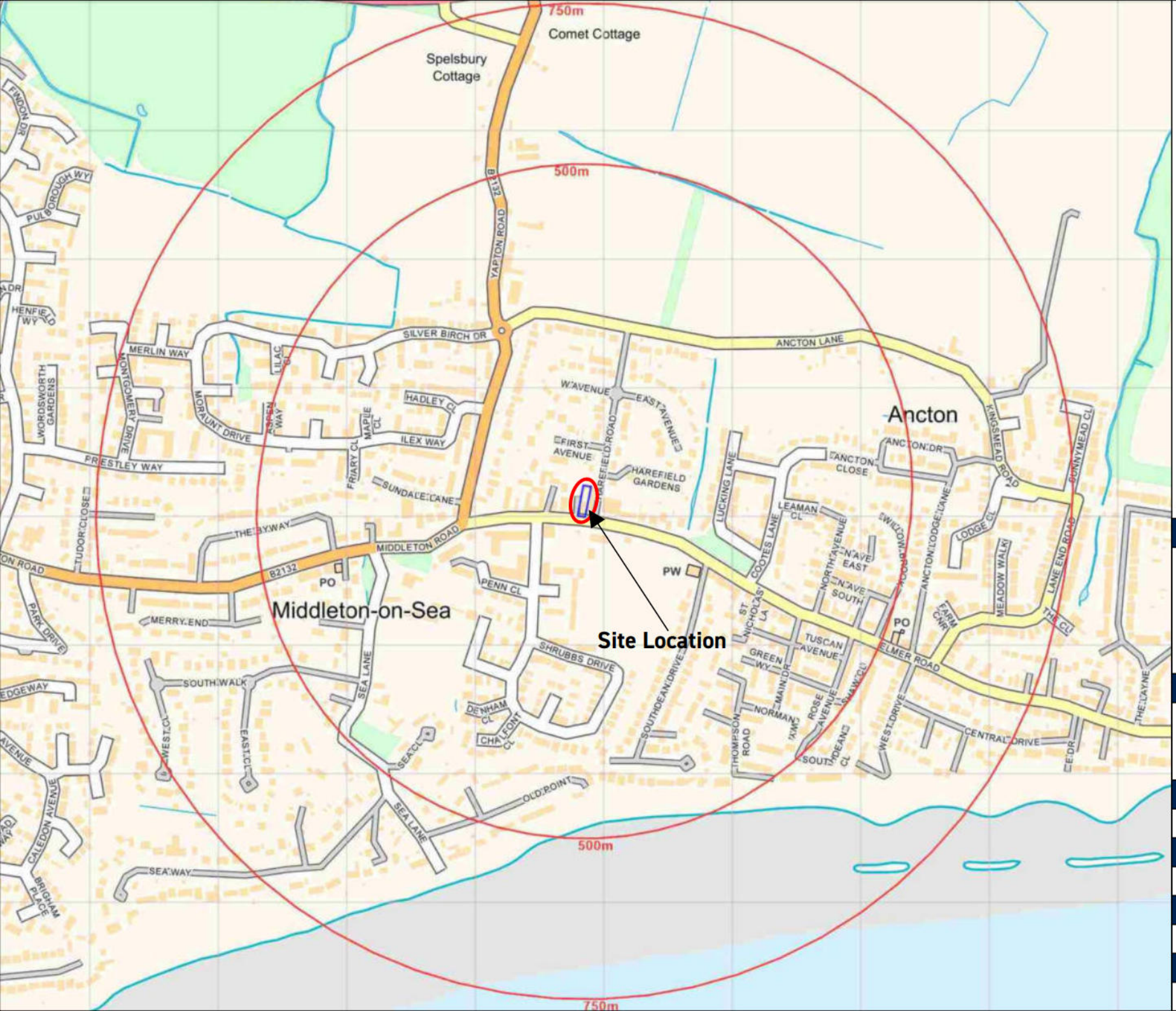
The results from the infiltration tests should be provided to engineers responsible for the design of the drainage system.

To comply with building regulations[3], point discharging infiltration systems (conventional ring or trench soakaways) are required to be constructed a minimum of 5.0m away from proposed or existing buildings.

[2] Conducted in general accordance with the requirements of BRE 365, Soakaway Design.
[3] The Building Regulations 2010; Part H; Drainage and Waste Disposal

FIGURES & APPENDICES

Figure 1 Site Location Plan
Figure 2 Site Plan
Explanatory Notes
Exploratory Hole Record
Trial Pit Infiltration Test Results



N

ASHDOWN SITE INVESTIGATION

Head Office

Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG
contact@ashdownsi.co.uk

Site

Arundel Court
47 Elmer Road
Bognor Regis
West Sussex

Project Ref

P16949

Figure No

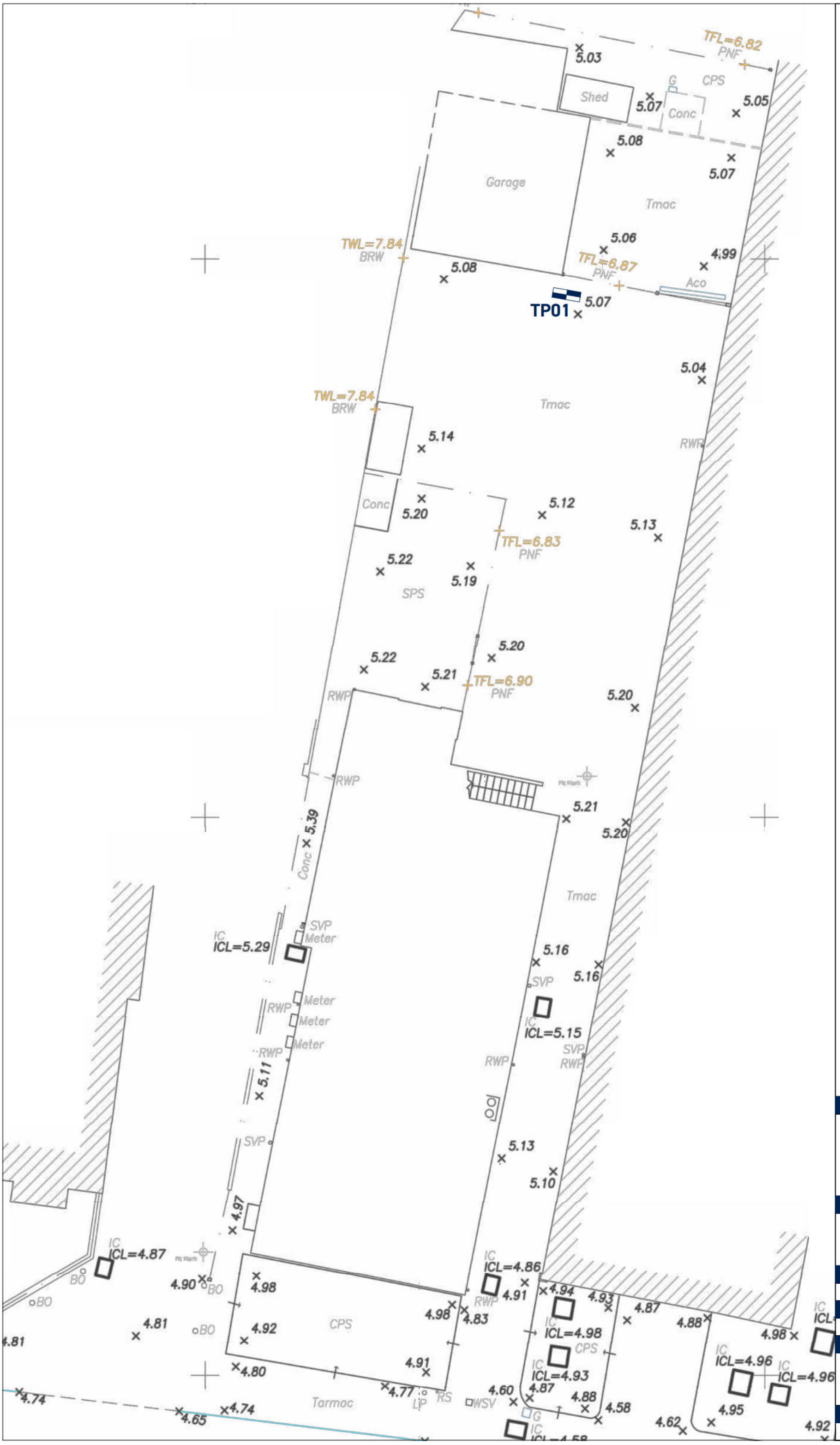
1

Drawing Title

Site Location Plan

Scale

Not To Scale



ASHDOWN SITE INVESTIGATION

Head Office

Unit 3
The Old Grain Store
Ditchling Common Business Park
Ditchling
East Sussex
BN6 8SG
contact@ashdownsi.co.uk

Site

Arundel Court
47 Elmer Road
Bognor Regis
West Sussex

Project Ref

P16949

Figure No

2

Drawing Title

Site Plan

Scale

Not To Scale

ASHDOWN
SITE INVESTIGATION

EXPLANATORY NOTES

Symbols and abbreviations on Exploratory Hole Records

Samples

U	'Undisturbed' Sample: - 100mm diameter by 450mm long. The number of blows to drive in the sampling tube is shown after the test index letter in the SPT column.
Pi	Piston Sample: 'Undisturbed' sample 100mm diameter by 600mm long.
D	Disturbed Sample
R	Root Sample
B	Bulk Disturbed Sample
W	Water Sample
ES	Environmental Suite (on older records may be referenced J T)

In Situ Testing

S	Standard penetration test (SPT): Using the split spoon sampler.
C	Standard Penetration Test (SPT): Using a solid cone instead of the sampler – conducted usually in coarse grained soils or weak rocks.
V	Shear Vane Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.
H	Hand penetrometer Test: Undrained shear strength (cohesion) (kN/m^2) shown within the Vane/Pen Test and N Value column.
P	Perth Penetrometer Test: Number of blows for 300mm penetration shown under Vane/Pen Test and N Value column.

Excavation Method

CP	Cable Percussion Borehole
RC	Rotary Cored Borehole
WLS	Dynamic Sampler Borehole using windowless sampler tubes
WS	Dynamic Sampler Borehole using window sampler tubes
TP	Trial Pit excavated using mechanic excavator
HDP	Trial Pit excavated using hand tools

Soil Description

Description and classification of soils has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of soil, Part 1 Identification and description (BS EN ISO 14688-1) and Part 2 Principles of classification (BS EN 14688-2) as well as the BS5930 code of Practice for Ground Investigations.

Rock Description

Description and classification of rocks has been carried out using as a general basis the British Standard Geotechnical investigation and testing – Identification and classification of rock, Part 1 Identification and classification (BS EN ISO 14689-1) as well as the BS5930 code of Practice for Ground Investigations. TCR – Total Core Recovery, SCR – Solid Core Recovery, RQD – Rock Quality Designation, NI – Non Intact, If – indicative fracture spacing (min/ave/max), FI – Fracture Index.

Chalk Description

Chalk description is based on BS EN ISO 14688, BS EN ISO 14689 and BS5930. The classification of chalk generally follows the guidance offered by the Construction Industry Research and Information Association (CIRIA) C574, 'Engineering in Chalk'. This is based on assessment of chalk density, discontinuity and aperture spacing, and the proportion of intact chalk to silt of chalk.

In Situ Strength Testing

Standard penetration testing (SPT) carried out in accordance with BS EN ISO 22476-3:2005.

Continuous dynamic probe testing conducted using a super heavy DPSH-B (As defined by BS EN ISO 22476-2:2005) probing geometry. The DPSH-B configuration is similar to that of the standard penetration test (SPT); the main differences being that the tip comprises a 90° cone, the driving rods are lighter than those used for SPT testing and the blow counts are recorded over 100mm increments rather than 300mm, as is the case for the SPT.

Perth penetrometer tests carried out in accordance with Australian Standard AS 1289:6.3.3-1997, Method of Testing Soils for Engineering Purposes; no equivalent European or British Standard having been published to date.

Undrained shear strength determinations made in-situ using a Geonor hand shear vane or a hand penetrometer.

Testing to determine the in-situ California Bearing Ratio (CBR) of soils conducted at shallow depths using a hand-held Transport Research Laboratory (TRL) cone penetrometer.

ASHDOWN

Site Name: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex

Job Number: P16949

Start Date: 02/12/2024

End Date: 02/12/2024

Trial Pit Number: **TP01** Sheet 1 of 1

Samples and In Situ Testing				Legend	Depth/ Reduced Level	Stratum Description
Sample/ Test Type	Depth From (m)	Depth To (m)	Test Result			
					0.00	Asphalt.
ES	0.15				0.10	MADE GROUND: Brown gravelly slightly sandy silty clay. Gravel is subangular to subrounded fine to coarse flint, crystalline rock and rare brick.
ES	0.30				0.20	MADE GROUND: Grey sandy silty angular to subrounded fine to coarse GRAVEL of flint and crystalline rock.
ES	0.60				0.35	MADE GROUND: Grey brown slightly gravelly slightly sandy silty clay. Gravel is subangular to subrounded fine to coarse flint with occasional brick and concrete. With occasional cobbles and boulders.
D	0.90				0.70	Orange brown and grey mottled slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine to coarse flint and chalk. (River Terrace Deposits)
					0.96	End of trial pit at 0.96m

Remarks

Groundwater: Trial pit dry on completion.

Stability: Trial pit stable on completion.

Notes: Pit excavated to depths of between 0.95m and 0.97m, with an average pit depth of 0.96m.

Excavation Method: HDP

Pit Length: 1.02m

Pit Width: 0.34m

Made By: TM

TRIAL PIT INFILTRATION TEST RESULTS

Site: Arundel Court, 47 Elmer Road, Bognor Regis, West Sussex **Project Ref:** P16949

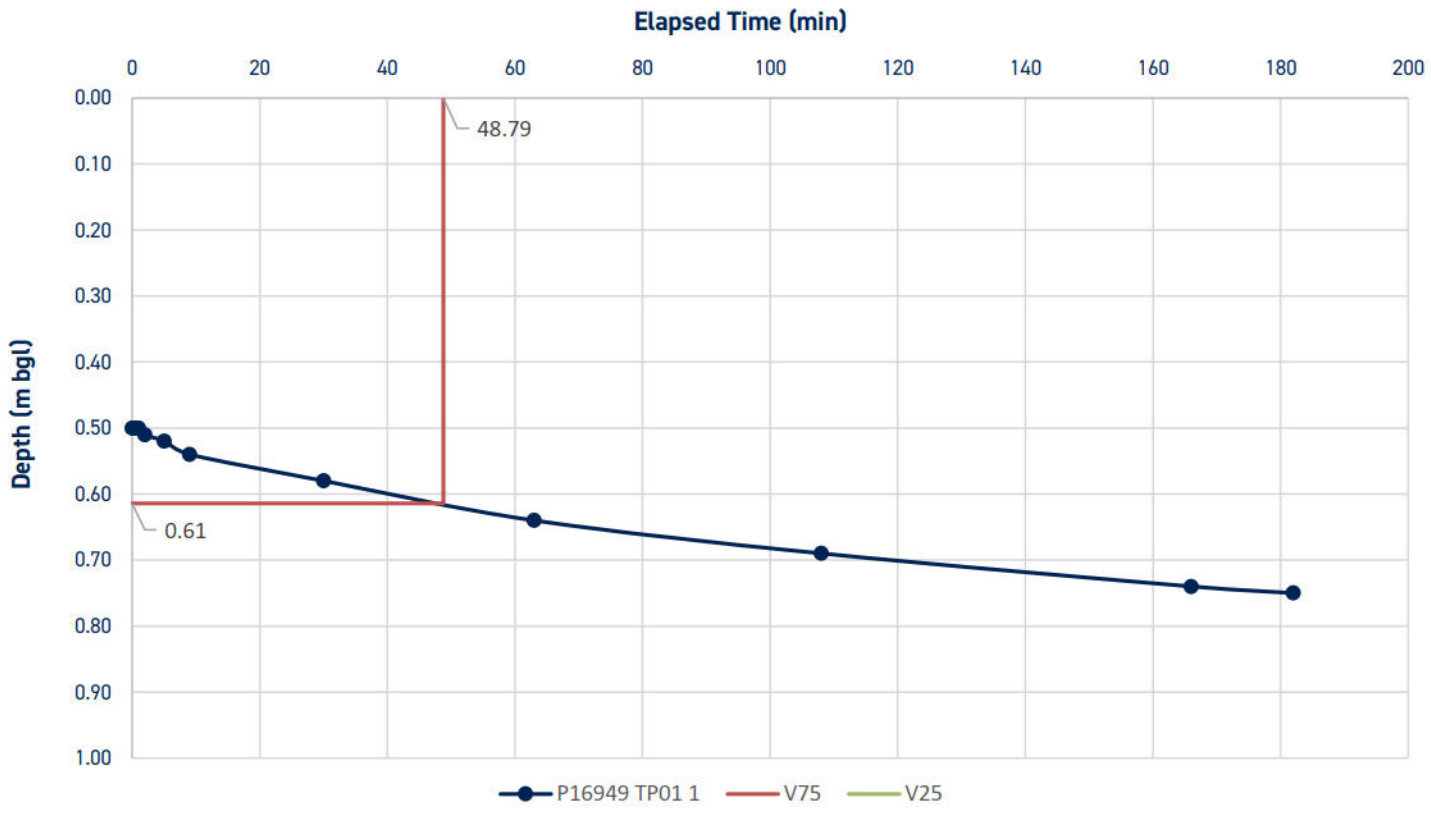
Test Location Reference	**TP01**
Test Number	**1**

Width of Pit	0.34 m	W
Length of Pit	1.02 m	L
Depth of Pit	0.96 m	D
Pit type	Open	

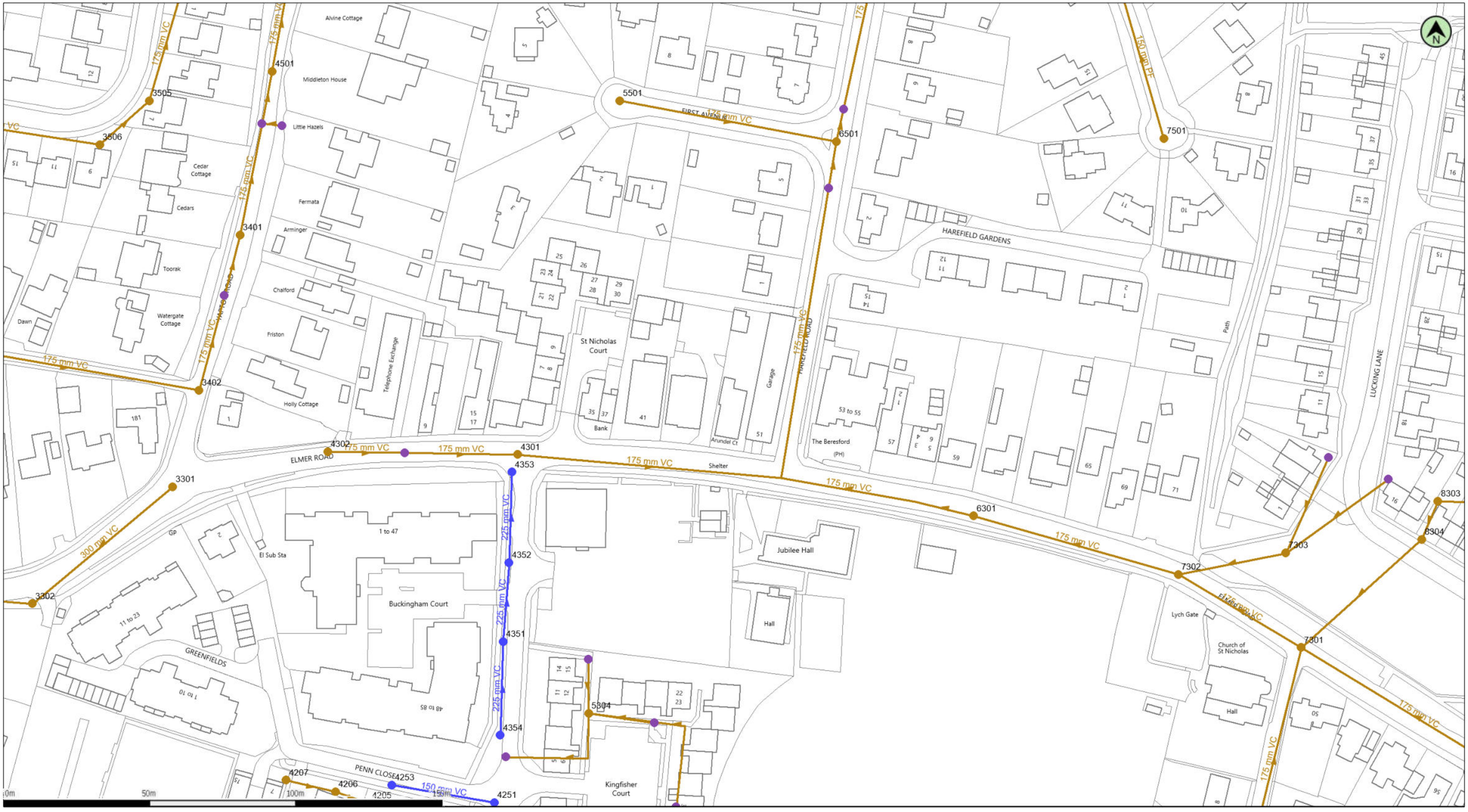
Volume of water introduced into pit	0.156 m^3	
Initial head of water	0.46 m	h_o
Water level at start of test	0.50 m	
Water level at end of test	0.75 m	
Volume of water discharged from pit	0.085 m^3	
Duration of test	182 min	
Average soaked surface area	1.24 m^2	
Time for water level to fall to 75% of initial head	48.79 min	t_{p75}
Time for water level to fall to 25% of initial head	Not reached min	t_{p25}
Depth to water at 75% of initial head	0.61 m	d_{75}
Depth to water at 25% of initial head	Not reached m	d_{25}
Time for the water level to fall from 75% to 25% of initial head	Not reached min	t_{p75-25}
Effective storage volume of water in the soakage trial pit between 75% and 25% of initial head	Not reached m^3	V_{p75-25}
Internal surface area of the soakage trial pit up to 50% of initial head and including the base area	0.96 m^2	a_{s50}

Infiltration rate **6.31E-06 m/sec** **f**

Calculation method: The water level did not fall below 25% of the effective storage depth. 'f' has been calculated by dividing the volume of water lost during the test by the product of the average surface area in contact with water during the test and the test duration.



Appendix D Public Sewer Records

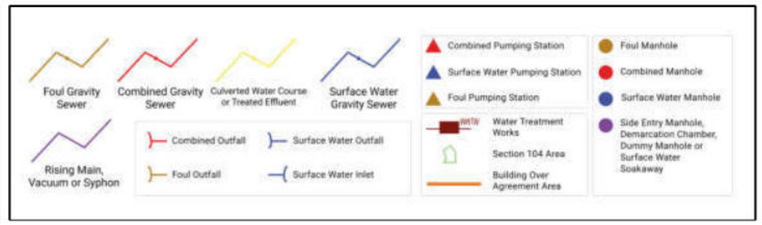


(c) Crown copyright and database rights 2024 Ordnance Survey AC0000808122 | Date: 04/12/24 | Scale: 1:1250 | Map Centre: 497568,100415 | Data updated: 27/11/24 | Our Ref: 1633734 - 1 | Wastewater Plan A3 Powered by digdat

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2024 Ordnance Survey AC0000808122 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



searches@bpcivils.co.uk

D2317 Arundel Court

WATER for LIFE from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
3301	F	4.90	3.55	
3302	F	5.37	3.27	
3401	F	4.88	3.35	
3402	F	4.92	0.00	
3505	F	5.52	3.07	
3506	F	5.56	3.17	
4205	F	0.00	0.00	
4206	F	0.00	0.00	
4207	F	0.00	0.00	
4301	F	5.17	0.00	
4302	F	5.48	3.92	
4501	F	4.42	2.82	
5304	F	0.00	0.00	
5501	F	5.45	3.76	
6301	F	4.54	2.16	
6501	F	5.11	1.21	
7301	F	4.79	2.73	
7302	F	4.70	2.35	
7303	F	0.00	0.00	
7501	F	4.90	3.61	
8303	F	0.00	0.00	
8304	F	0.00	0.00	
4251	S	5.70	5.01	
4253	S	5.99	5.23	
4351	S	5.47	4.59	
4352	S	5.34	4.42	
4353	S	5.06	0.00	
4354	S	5.68	4.70	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix E Coastal Drains Drainage Investigation

Project

Project Name:	47 Elmer Rd
Project Description:	CCTV Survey, Trace & Plot
Project Status:	Complete
Project Date:	19/01/2026
Inspection Standard:	MSCC5 Sewers & Drainage GB (SRM5 Scoring)

Table of Contents

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

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Section Item 2: SVP > MH3 (SVPX) 3
Section Item 3: FWG > MH3 (FWGX) 5
Section Item 4: MH3 > MH2 (MH3X) 7
Section Item 5: SVP > MH2 (SVPX) 10
Section Item 6: MH2 > MH1 (MH2X) 12
Section Item 7: MH1 > Sewer (MH1X) 14
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Project Information

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

Site

Street: 47 Elmer Rd
Town or City: Elmer
County: W.Sussex
Post Code: PO22 6LB

Contractor

Company: Coastal Drains
Department: Unit 3, Wayside
Street: 7 Commerce Way
Town or City: Lancing
County: West Sussex
Post Code: BN15 8SW

COASTAL DRAINS LTD

Project Information

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

Project Drawing, Page '47 Elmer Rd'



Scoring Summary

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

Structural Defects

Grade 3: Best practice suggests consideration should be given to repairs in the medium term.

Grade 4: Best practice suggests consideration should be given to repairs to avoid a potential collapse.

Grade 5: Best practice suggests that this pipe is at risk of collapse at any time. Urgent consideration should be given to repairs to avoid total failure.

Section	PLR	Grade	Description
1	AX	5	Collapsed drain or sewer, 100% cross-sectional area loss

Service / Operational Condition

Grade 3: Best practice suggests consideration should be given to maintenance activities in the medium term.

Grade 4: Best practice suggests consideration should be given to maintenance activity to avoid potential blockages.

Grade 5: Best practice suggests that this pipe is at a high risk of backing up or causing flooding.

Section	PLR	Grade	Description
1	AX	4	Settled deposits, coarse, 30% cross-sectional area loss, finish
3	FWGX	3	Settled deposits, hard or compacted, 10% cross-sectional area loss, finish
4	MH3X	3	Multiple defects
6	MH2X	4	Settled deposits, coarse, 35% cross-sectional area loss
7	MH1X	4	Multiple defects
8	YGX	5	Settled deposits, coarse, 100% cross-sectional area loss
10	RWP1X	5	Settled deposits, coarse, 100% cross-sectional area loss

Abandoned Surveys

Section	PLR	Description
1	AX	Survey abandoned
8	YGX	Survey abandoned
10	RWP1X	Survey abandoned
11	RWP2X	Survey abandoned
12	RWP3X	Survey abandoned
13	RWP4X	Survey abandoned
14	RWP5X	Survey abandoned

Information

These scoring summaries are based on the SRM grading from the WRc.

Project Pictures

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026



Corroded cover to MH3

Section Profile

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

Circular, 100 mm

Item No.	Upstream Node	Downstream Node	Date	Road	Material	Total Length	Inspected Length
2	SVP	MH3	19/01/2026	Elmer Rd	Polyvinyl chloride	7.20 m	7.20 m
3	FWG	MH3	19/01/2026	Elmer Rd	Polyvinyl chloride	2.90 m	2.90 m
4	MH3	MH2	19/01/2026	Elmer Rd	Vitrified clay	8.90 m	8.90 m
5	SVP	MH2	19/01/2026	Elmer Rd	Vitrified clay	1.00 m	1.00 m
6	MH2	MH1	19/01/2026	Elmer Rd	Vitrified clay	9.70 m	9.70 m
7	MH1	Sewer	19/01/2026	Elmer Rd	Vitrified clay	11.30 m	11.30 m
9	CD	SK	19/01/2026	Elmer Rd	Polyvinyl chloride	6.20 m	6.20 m

Total: 7 Inspections x Circular 100 mm, 0 mm = 47.20 m Total Length and 47.20 m Inspected Length

Total: 7 Inspections = 47.20 m Total Length and 47.20 m Inspected Length

Section Summary

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

Number of sections	14
Total length of sections	48.10 m
Total length of inspected sections	47.90 m
Total length of not inspected sections	0.20 m
Number of abandoned inspections	7
Number of section inspection photos	52
Number of section inspection videos	12
Number of section inspection scans	0
Number of section inclination measurements	0

PLR:	AX	**Upstream Node:**	A
Inspection Direction:	Upstream	**Downstream Node:**	MH3
Inspected Length:	0.70 m	**Dia/Height:**	100 mm
Total Length:	0.70 m	**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH3, Inlet 1
2	0.00	DER	Settled deposits, coarse, 30% cross-sectional area loss, start
3	0.00	WL	Water level, 0% of the vertical dimension
4	0.70	DER	Settled deposits, coarse, 30% cross-sectional area loss, finish
5	0.70	XP	Collapsed drain or sewer, 100% cross-sectional area loss
6	0.70	SA	Survey abandoned, Assumed redundant

PLR:	SVPX	**Upstream Node:**	SVP
Inspection Direction:	Upstream	**Downstream Node:**	MH3
Inspected Length:	7.20 m	**Dia/Height:**	100 mm
Total Length:	7.20 m	**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH3, Inlet 2
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.10	LL	Line deviates left
4	1.30	JN	Junction at 9 o'clock, 100mm dia
5	2.90	JN	Junction at 10 o'clock, 100mm dia
6	6.70	LU	Line deviates up
7	7.20	MHF	Finish node, manhole, reference: SVP

Section Summary

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

PLR:	FWGX	**Upstream Node:**	FWG
Inspection Direction:	Upstream	**Downstream Node:**	MH3
Inspected Length:	2.90 m	**Dia/Height:**	100 mm
Total Length:	2.90 m	**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH3, Inlet 3
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.10	LR	Line deviates right
4	1.20	JN	Junction at 1 o'clock, 100mm dia
5	1.50	DEC	Settled deposits, hard or compacted, 15% cross-sectional area loss, start
6	2.60	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss, change
7	2.90	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss, finish
8	2.90	GYF	Finish node, gully, reference: FWG

PLR:	MH3X	**Upstream Node:**	MH3
Inspection Direction:	Downstream	**Downstream Node:**	MH2
Inspected Length:	8.90 m	**Dia/Height:**	100 mm
Total Length:	8.90 m	**Material:**	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH3
2	0.00	WL	Water level, 5% of the vertical dimension, Live
3	0.90	OJM	Open joint, medium
4	1.00	WL	Water level, 10% of the vertical dimension
5	1.70	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss
6	3.60	DEG	Attached deposits, grease from 9 o'clock to 3 o'clock, 5% cross-sectional area loss, start
7	4.40	OJM	Open joint, medium
8	4.40	DEG	Attached deposits, grease from 9 o'clock to 3 o'clock, 10% cross-sectional area loss, change
9	5.70	OJM	Open joint, medium
10	8.80	DEG	Attached deposits, grease from 9 o'clock to 3 o'clock, 10% cross-sectional area loss, finish
11	8.90	MHF	Finish node, manhole, reference: MH2

PLR:	SVPX	**Upstream Node:**	SVP
Inspection Direction:	Upstream	**Downstream Node:**	MH2
Inspected Length:	1.00 m	**Dia/Height:**	100 mm
Total Length:	1.00 m	**Material:**	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH2, Inlet 2
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.70	LU	Line deviates up
4	1.00	MHF	Finish node, manhole, reference: SVP

PLR:	MH2X	**Upstream Node:**	MH2
Inspection Direction:	Downstream	**Downstream Node:**	MH1
Inspected Length:	9.70 m	**Dia/Height:**	100 mm
Total Length:	9.70 m	**Material:**	Vitrified clay

Section Summary

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH2
2	0.00	WL	Water level, 0% of the vertical dimension
3	1.50	DER	Settled deposits, coarse, 35% cross-sectional area loss
4	9.70	MHF	Finish node, manhole, reference: MH1

PLR:	MH1X	**Upstream Node:**	MH1
Inspection Direction:	Downstream	**Downstream Node:**	Sewer
Inspected Length:	11.30 m	**Dia/Height:**	100 mm
Total Length:	11.30 m	**Material:**	Vitrified clay

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: MH1
2	0.00	WL	Water level, 0% of the vertical dimension
3	5.00	DEG	Attached deposits, grease from 10 o'clock to 2 o'clock, 10% cross-sectional area loss, start
4	5.70	DEG	Attached deposits, grease from 10 o'clock to 2 o'clock, 10% cross-sectional area loss, finish
5	8.90	DEEJ	Attached deposits, encrustation at joint from 8 o'clock to 4 o'clock, 30% cross-sectional area loss
6	9.50	JDM	Joint displaced, medium
7	10.40	JN	Junction at 12 o'clock, 100mm dia
8	10.80	LL	Line deviates left
9	11.10	JDL	Joint displaced, large
10	11.30	BRF	Finish node, major connection without manhole, reference: Sewer

PLR:	YGX	**Upstream Node:**	YG
Inspection Direction:	Downstream	**Downstream Node:**	
Inspected Length:	0.00 m	**Dia/Height:**	100 mm
Total Length:		**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	GY	Start node, gully, reference: YG
2	0.00	DER	Settled deposits, coarse, 100% cross-sectional area loss, Blocked
3	0.00	SA	Survey abandoned, Unable to survey

PLR:	CDX	**Upstream Node:**	CD
Inspection Direction:	Downstream	**Downstream Node:**	SK
Inspected Length:	6.20 m	**Dia/Height:**	100 mm
Total Length:	6.20 m	**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	GY	Start node, gully, reference: CD
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.10	REM	General remark, Rest bend
4	6.20	SKF	Finish node, soakaway, reference: SK

PLR:	RWP1X	**Upstream Node:**	RWP1
Inspection Direction:	Downstream	**Downstream Node:**	A
Inspected Length:	0.20 m	**Dia/Height:**	75 mm
Total Length:	0.20 m	**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: RWP1, Serving neighbouring property

Section Summary

Project Name	Project Number	Project Date
47 Elmer Rd		19/01/2026

No.	m+	Code	Observation
2	0.00	WL	Water level, 0% of the vertical dimension
3	0.00	SA	Survey abandoned, Unable to survey
4	0.20	DER	Settled deposits, coarse, 100% cross-sectional area loss, Blocked

PLR:	RWP2X	**Upstream Node:**	RWP2
Inspection Direction:	Downstream	**Downstream Node:**	A
Inspected Length:	0.00 m	**Dia/Height:**	75 mm
Total Length:		**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: RWP2
2	0.00	SA	Survey abandoned, No access. Unable to survey

PLR:	RWP3X	**Upstream Node:**	RWP3
Inspection Direction:	Downstream	**Downstream Node:**	A
Inspected Length:	0.00 m	**Dia/Height:**	75 mm
Total Length:		**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: RWP3
2	0.00	SA	Survey abandoned, No access. Unable to survey

PLR:	RWP4X	**Upstream Node:**	RWP4
Inspection Direction:	Downstream	**Downstream Node:**	A
Inspected Length:	0.00 m	**Dia/Height:**	75 mm
Total Length:		**Material:**	Polyvinyl chloride

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: RWP4
2	0.00	SA	Survey abandoned, No access. Unable to survey

PLR:	RWP5X	**Upstream Node:**	RWP5
Inspection Direction:	Downstream	**Downstream Node:**	A
Inspected Length:	0.00 m	**Dia/Height:**	75 mm
Total Length:		**Material:**	

No.	m+	Code	Observation
1	0.00	MH	Start node, manhole, reference: RWP5
2	0.00	SA	Survey abandoned, No access. Unable to survey

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - AX

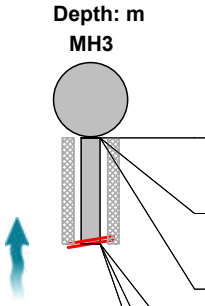
Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
1	1	19/01/26	9:44	Not Specified	No Rain Or Snow	No	AX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Upstream	**Upstream Node:**	A
Road:	Elmer Rd	**Inspected Length:**	0.70 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.70 m	**Downstream Node:**	MH3
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:



Scale: 1:50	Position [m]		Code	Observation	MPEG	Photo	Grade
	0.00		MH	Start node, manhole, reference: MH3: Inlet 1	00:00:00		
	0.00	S01	DER	Settled deposits, coarse, 30% cross-sectional area loss, start	00:00:00	1	
	0.00		WL	Water level, 0% of the vertical dimension	00:00:00	2	
	0.70	F01	DER	Settled deposits, coarse, 30% cross-sectional area loss, finish	00:00:47		4
	0.70		XP	Collapsed drain or sewer, 100% cross-sectional area loss	00:00:47	3	5
	0.70		SA	Survey abandoned: Assumed redundant	00:00:49		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
1	165.0	235.7	165.0	5.0	1	5.0	7.1	5.0	5.0

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Pictures - 19/01/2026 - AX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
1	Upstream	AX		



1, 00:00:00, 0.00 m
Settled deposits, coarse, 30% cross-sectional area loss, start



2, 00:00:00, 0.00 m
Water level, 0% of the vertical dimension



3, 00:00:47, 0.70 m
Collapsed drain or sewer, 100% cross-sectional area loss

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - SVPX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
2	1	19/01/26	9:46	Not Specified	No Rain Or Snow	No	SVPX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Upstream	**Upstream Node:**	SVP
Road:	Elmer Rd	**Inspected Length:**	7.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	7.20 m	**Downstream Node:**	MH3
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:63

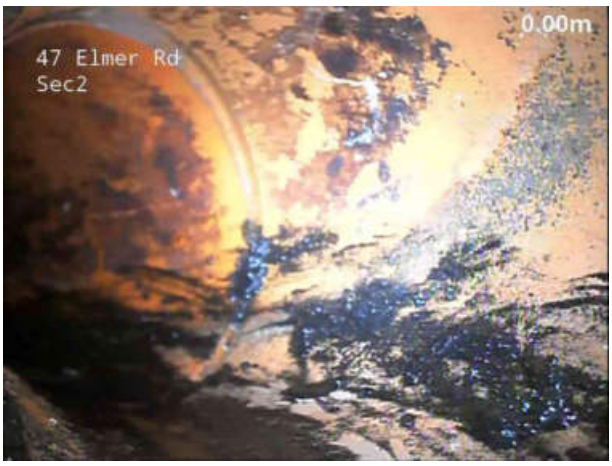


Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH3: Inlet 2	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:04		
0.10	LL	Line deviates left	00:00:04	1	
1.30	JN	Junction at 9 o'clock, 100mm dia	00:00:17	2	
2.90	JN	Junction at 10 o'clock, 100mm dia	00:00:27	3	
6.70	LU	Line deviates up	00:00:51	4	
7.20	MHF	Finish node, manhole, reference: SVP	00:00:56	5	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
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Section Pictures - 19/01/2026 - SVPX

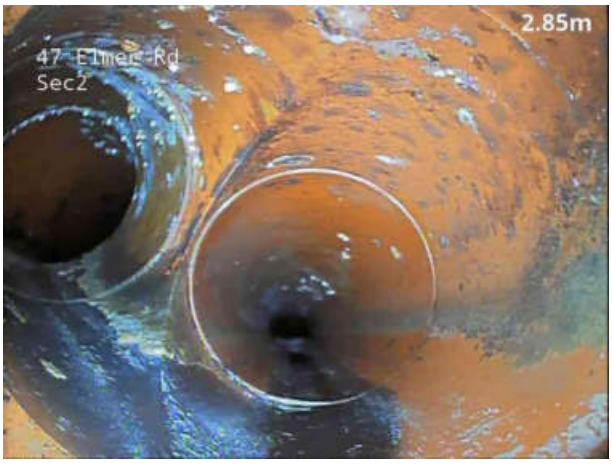
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
2	Upstream	SVPX		



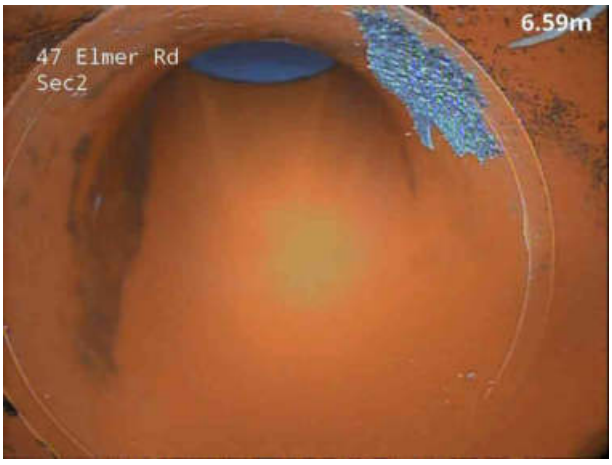
1, 00:00:04, 0.10 m
Line deviates left



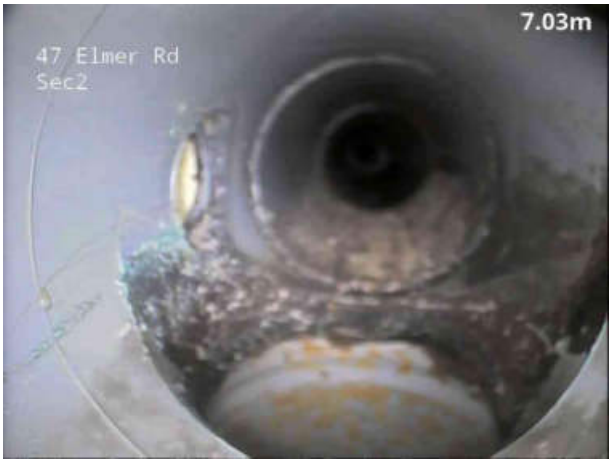
2, 00:00:17, 1.30 m
Junction at 9 o'clock, 100mm dia



3, 00:00:27, 2.90 m
Junction at 10 o'clock, 100mm dia



4, 00:00:51, 6.70 m
Line deviates up



5, 00:00:56, 7.20 m
Finish node, manhole, reference: SVP

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - FWGX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
3	1	19/01/26	9:51	Not Specified	No Rain Or Snow	No	FWGX

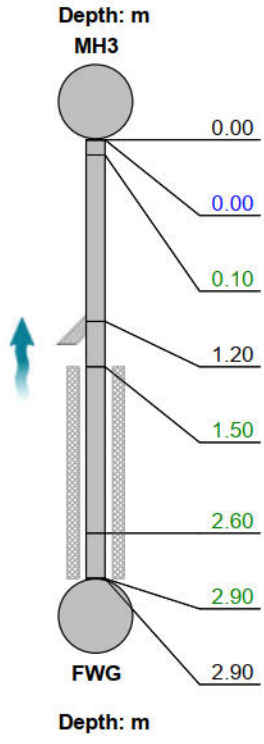
Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Upstream	**Upstream Node:**	FWG
Road:	Elmer Rd	**Inspected Length:**	2.90 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	2.90 m	**Downstream Node:**	MH3
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH3: Inlet 3	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:05		
0.10		LR	Line deviates right	00:00:05	1	
1.20		JN	Junction at 1 o'clock, 100mm dia	00:00:20	2	
1.50	S01	DEC	Settled deposits, hard or compacted, 15% cross-sectional area loss, start	00:00:32	3	
2.60	C01	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss, change	00:00:41	4	
2.90	F01	DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss, finish	00:00:41		3
2.90		GYF	Finish node, gully, reference: FWG	00:00:43	5	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	STR Peak	STR Mean	STR Total	STR Grade	SER No. Def	SER Peak	SER Mean	SER Total	SER Grade
0	0.0	0.0	0.0	1.0	1	2.0	1.4	4.0	3.0

Section Pictures - 19/01/2026 - FWGX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
3	Upstream	FWGX		



1, 00:00:05, 0.10 m
Line deviates right



2, 00:00:20, 1.20 m
Junction at 1 o'clock, 100mm dia



3, 00:00:32, 1.50 m
Settled deposits, hard or compacted, 15% cross-sectional area loss, start



4, 00:00:41, 2.60 m
Settled deposits, hard or compacted, 10% cross-sectional area loss, change



5, 00:00:43, 2.90 m
Finish node, gully, reference: FWG

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Section Inspection - 19/01/2026 - MH3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
4	1	19/01/26	10:05	Not Specified	No Rain Or Snow	No	MH3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	MH3
Road:	Elmer Rd	**Inspected Length:**	8.90 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	8.90 m	**Downstream Node:**	MH2
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:78



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH3	00:00:00		
0.00		WL	Water level, 5% of the vertical dimension: Live	00:00:02	1	
0.90		OJM	Open joint, medium	00:00:14	2	1
1.00		WL	Water level, 10% of the vertical dimension	00:00:18	3	
1.70		DEC	Settled deposits, hard or compacted, 10% cross-sectional area loss	00:00:25	4	3
3.60	S01	DEG	Attached deposits, grease from 9 o'clock to 3 o'clock, 5% cross-sectional area loss, start	00:00:37	5	
4.40		OJM	Open joint, medium	00:00:40	6	1
4.40	C01	DEG	Attached deposits, grease from 9 o'clock to 3 o'clock, 10% cross-sectional area loss, change	00:00:43	7	
5.70		OJM	Open joint, medium	00:00:55	8	1
8.80	F01	DEG	Attached deposits, grease from 9 o'clock to 3 o'clock, 10% cross-sectional area loss, finish	00:01:33		3
8.90		MHF	Finish node, manhole, reference: MH2	00:01:33	9	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
3	1.0	0.3	3.0	1.0	2	4.0	2.9	26.0	4.0

Section Pictures - 19/01/2026 - MH3X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Downstream	MH3X		



1, 00:00:02, 0.00 m
Water level, 5% of the vertical dimension, Live



2, 00:00:14, 0.90 m
Open joint, medium



3, 00:00:18, 1.00 m
Water level, 10% of the vertical dimension



4, 00:00:25, 1.70 m
Settled deposits, hard or compacted, 10% cross-sectional area loss



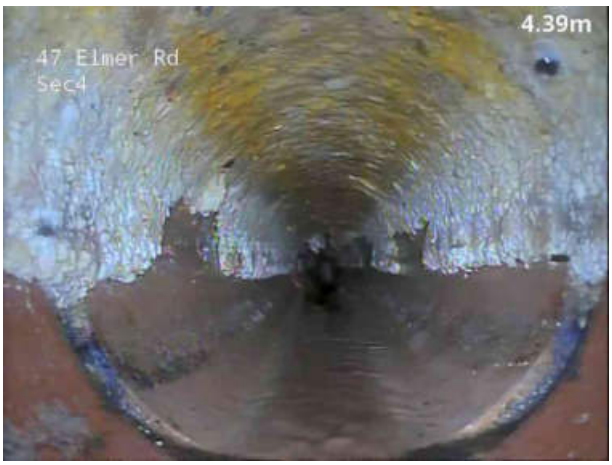
5, 00:00:37, 3.60 m
Attached deposits, grease from 9 o'clock to 3 o'clock, 5% cross-sectional area loss, start



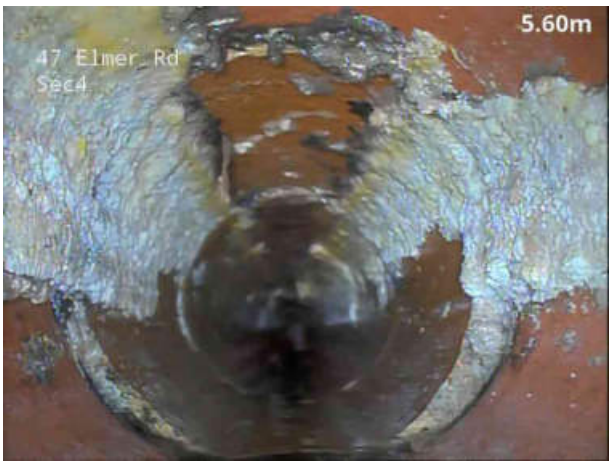
6, 00:00:40, 4.40 m
Open joint, medium

Section Pictures - 19/01/2026 - MH3X

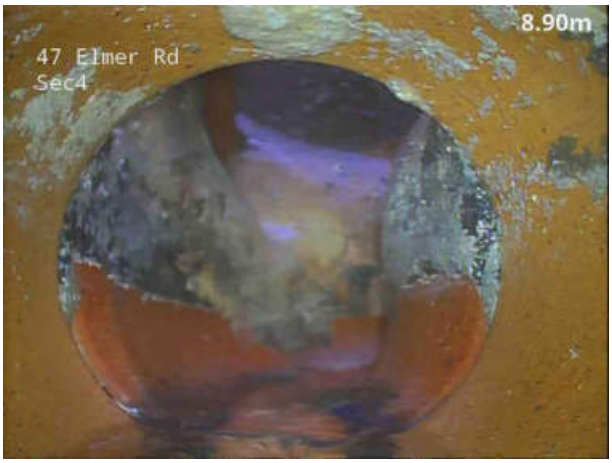
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
4	Downstream	MH3X		



7, 00:00:43, 4.40 m
Attached deposits, grease from 9 o'clock to 3 o'clock, 10% cross-sectional area loss, change



8, 00:00:55, 5.70 m
Open joint, medium



9, 00:01:33, 8.90 m
Finish node, manhole, reference: MH2

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Section Inspection - 19/01/2026 - SVPX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
5	1	19/01/26	10:09	Not Specified	No Rain Or Snow	No	SVPX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Upstream	**Upstream Node:**	SVP
Road:	Elmer Rd	**Inspected Length:**	1.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	1.00 m	**Downstream Node:**	MH2
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH2: Inlet 2	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:03	1	
0.70	LU	Line deviates up	00:00:09	2	
1.00	MHF	Finish node, manhole, reference: SVP	00:00:17	3	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 19/01/2026 - SVPX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
5	Upstream	SVPX		



1, 00:00:03, 0.00 m
Water level, 0% of the vertical dimension



2, 00:00:09, 0.70 m
Line deviates up



3, 00:00:17, 1.00 m
Finish node, manhole, reference: SVP

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Section Inspection - 19/01/2026 - MH2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
6	1	19/01/26	10:14	Not Specified	No Rain Or Snow	No	MH2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	MH2
Road:	Elmer Rd	**Inspected Length:**	9.70 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	9.70 m	**Downstream Node:**	MH1
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:84



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	MH	Start node, manhole, reference: MH2	00:00:00		
0.00	WL	Water level, 0% of the vertical dimension	00:00:02	1	
1.50	DER	Settled deposits, coarse, 35% cross-sectional area loss	00:00:15	2	4
9.70	MHF	Finish node, manhole, reference: MH1	00:01:06	3	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	5.0	0.5	5.0	4.0

Section Pictures - 19/01/2026 - MH2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
6	Downstream	MH2X		



1, 00:00:02, 0.00 m
Water level, 0% of the vertical dimension



2, 00:00:15, 1.50 m
Settled deposits, coarse, 35% cross-sectional area loss



3, 00:01:06, 9.70 m
Finish node, manhole, reference: MH1

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Section Inspection - 19/01/2026 - MH1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
7	1	19/01/26	10:16	Not Specified	No Rain Or Snow	No	MH1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	MH1
Road:	Elmer Rd	**Inspected Length:**	11.30 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	11.30 m	**Downstream Node:**	SEWER
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Vitrified clay
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:98



Position [m]		Code	Observation	MPEG	Photo	Grade
0.00		MH	Start node, manhole, reference: MH1	00:00:00		
0.00		WL	Water level, 0% of the vertical dimension	00:00:01	1	
5.00	S01	DEG	Attached deposits, grease from 10 o'clock to 2 o'clock, 10% cross-sectional area loss, start	00:00:37	2	
5.70	F01	DEG	Attached deposits, grease from 10 o'clock to 2 o'clock, 10% cross-sectional area loss, finish	00:00:43	3	3
8.90		DEEJ	Attached deposits, encrustation at joint from 8 o'clock to 4 o'clock, 30% cross-sectional area loss	00:01:02	4, 5	4
9.50		JDM	Joint displaced, medium	00:01:09	6	1 / 3
10.40		JN	Junction at 12 o'clock, 100mm dia	00:01:18	7	
10.80		LL	Line deviates left	00:01:21	8	
11.10		JDL	Joint displaced, large	00:01:27	9	1 / 4
11.30		BRF	Finish node, major connection without manhole, reference: Sewer	00:01:30	10	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
2	2.0	0.3	3.0	1.0	4	5.0	1.4	16.0	4.0

Section Pictures - 19/01/2026 - MH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	MH1X		



1, 00:00:01, 0.00 m
Water level, 0% of the vertical dimension



2, 00:00:37, 5.00 m
Attached deposits, grease from 10 o'clock to 2 o'clock, 10% cross-sectional area loss, start



3, 00:00:43, 5.70 m
Attached deposits, grease from 10 o'clock to 2 o'clock, 10% cross-sectional area loss, finish



4, 00:01:02, 8.90 m
Attached deposits, encrustation at joint from 8 o'clock to 4 o'clock, 30% cross-sectional area loss



5, 00:01:02, 8.90 m
Attached deposits, encrustation at joint from 8 o'clock to 4 o'clock, 30% cross-sectional area loss



6, 00:01:09, 9.50 m
Joint displaced, medium

Section Pictures - 19/01/2026 - MH1X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
7	Downstream	MH1X		



7, 00:01:18, 10.40 m
Junction at 12 o'clock, 100mm dia



8, 00:01:21, 10.80 m
Line deviates left



9, 00:01:27, 11.10 m
Joint displaced, large



10, 00:01:30, 11.30 m
Finish node, major connection without manhole, reference: Sewer

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Section Inspection - 19/01/2026 - YGX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
8	1	19/01/26	10:25	Not Specified	No Rain Or Snow	No	YGX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	YG
Road:	Elmer Rd	**Inspected Length:**	0.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.00 m	**Downstream Node:**	
Surface Type:	Asphalt	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50 Depth: m	Position [m]	Code	Observation	MPEG	Photo	Grade
YG	0.00	GY	Start node, gully, reference: YG	00:00:00	1	
	0.00	DER	Settled deposits, coarse, 100% cross-sectional area loss: Blocked	00:00:16	2	5
	0.00	SA	Survey abandoned: Unable to survey	00:00:21		

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	10.0	0.0	10.0	5.0

Section Pictures - 19/01/2026 - YGX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
8	Downstream	YGX		



1, 00:00:00, 0.00 m
Start node, gully, reference: YG



2, 00:00:16, 0.00 m
Settled deposits, coarse, 100% cross-sectional area loss, Blocked

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7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - CDX

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
9	1	19/01/26	10:28	Not Specified	No Rain Or Snow	No	CDX

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	CD
Road:	Elmer Rd	**Inspected Length:**	6.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	6.20 m	**Downstream Node:**	SK
Surface Type:	Asphalt	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	100 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:54



Position [m]	Code	Observation	MPEG	Photo	Grade
0.00	GY	Start node, gully, reference: CD	00:00:00	1, 2	
0.00	WL	Water level, 0% of the vertical dimension	00:00:18		
0.10	REM	General remark: Rest bend	00:00:18	3	
6.20	SKF	Finish node, soakaway, reference: SK	00:00:51	4	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 19/01/2026 - CDX

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
9	Downstream	CDX		



1, 00:00:00, 0.00 m
Start node, gully, reference: CD



2, 00:00:00, 0.00 m
Start node, gully, reference: CD



3, 00:00:18, 0.10 m
General remark, Rest bend



4, 00:00:51, 6.20 m
Finish node, soakaway, reference: SK

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7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - RWP1X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
10	1	19/01/26	10:31	Not Specified	No Rain Or Snow	No	RWP1X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	RWP1
Road:	Elmer Rd	**Inspected Length:**	0.20 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.20 m	**Downstream Node:**	A
Surface Type:	Asphalt	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	75 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m RWP1						
	0.00	MH	Start node, manhole, reference: RWP1: Serving neighbouring property	00:00:00	1, 2	
	0.00	WL	Water level, 0% of the vertical dimension	00:00:19		
	0.00	SA	Survey abandoned: Unable to survey	00:00:25		
	0.20	DER	Settled deposits, coarse, 100% cross-sectional area loss: Blocked	00:00:19	3, 4	5
	0.20		End of pipe			

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	1	10.0	50.0	10.0	5.0

Section Pictures - 19/01/2026 - RWP1X

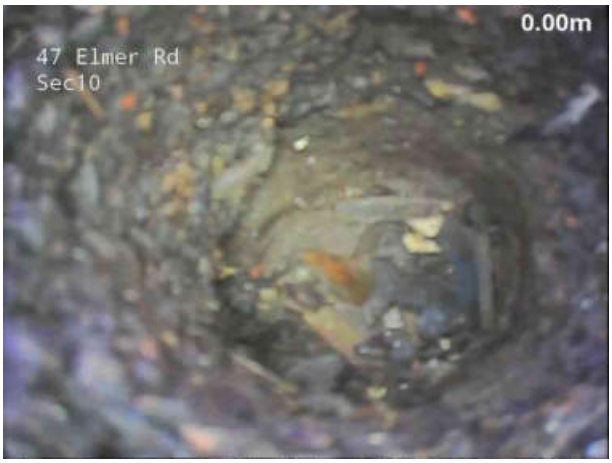
Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
10	Downstream	RWP1X		



1, 00:00:00, 0.00 m
Start node, manhole, reference: RWP1, Serving neighbouring property



2, 00:00:00, 0.00 m
Start node, manhole, reference: RWP1, Serving neighbouring property



3, 00:00:19, 0.20 m
Settled deposits, coarse, 100% cross-sectional area loss, Blocked



4, 00:00:19, 0.20 m
Settled deposits, coarse, 100% cross-sectional area loss, Blocked

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7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - RWP2X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
11	1	19/01/26	10:32	Not Specified	No Rain Or Snow	No	RWP2X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	RWP2
Road:	Elmer Rd	**Inspected Length:**	0.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.00 m	**Downstream Node:**	A
Surface Type:	Asphalt	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	75 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m RWP2						
	0.00	MH	Start node, manhole, reference: RWP2	00:00:00		
	0.00	SA	Survey abandoned: No access. Unable to survey	00:00:00	1	



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 19/01/2026 - RWP2X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
11	Downstream	RWP2X		



1, 00:00:00, 0.00 m
Survey abandoned, No access. Unable to survey

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - RWP3X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
12	1	19/01/26	10:32	Not Specified	No Rain Or Snow	No	RWP3X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	RWP3
Road:	Elmer Rd	**Inspected Length:**	0.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.00 m	**Downstream Node:**	A
Surface Type:	Asphalt	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	75 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m RWP3						
	0.00	MH	Start node, manhole, reference: RWP3	00:00:00		
	0.00	SA	Survey abandoned: No access. Unable to survey	00:00:01	1	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 19/01/2026 - RWP3X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
12	Downstream	RWP3X		



1, 00:00:01, 0.00 m
Survey abandoned, No access. Unable to survey

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Inspection - 19/01/2026 - RWP4X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
13	1	19/01/26	18:32	Not Specified	No Rain Or Snow	No	RWP4X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	RWP4
Road:	Elmer Rd	**Inspected Length:**	0.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.00 m	**Downstream Node:**	A
Surface Type:	Asphalt	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Surface water	**Pipe Shape:**	Circular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	75 mm
Flow Control:	No flow control	**Material:**	Polyvinyl chloride
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m RWP4						
	0.00	MH	Start node, manhole, reference: RWP4			
	0.00	SA	Survey abandoned: No access. Unable to survey		1	

Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 19/01/2026 - RWP4X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
13	Downstream	RWP4X		



1, 0.00 m
Survey abandoned, No access. Unable to survey

COASTAL DRAINS LTD

Coastal Drains
7 Commerce Way, Lancing

Section Inspection - 21/01/2026 - RWP5X

Item No.	Insp. No.	Date	Time	Client`s Job Ref	Weather	Pre Cleaned	PLR
14	1	21/01/26	14:37	Not Specified	No Rain Or Snow	No	RWP5X

Operator	Vehicle	Camera	Preset Length	Legal Status	Alternative ID
JY	FV73 RZB	P540	Not Specified	Private Drain	Not Specified

Town or Village:	Elmer	**Inspection Direction:**	Downstream	**Upstream Node:**	RWP5
Road:	Elmer Rd	**Inspected Length:**	0.00 m	**Upstream Pipe Depth:**	
Location:	Property or buildings	**Total Length:**	0.00 m	**Downstream Node:**	A
Surface Type:	Various	**Joint Length:**		**Downstream Pipe Depth:**	

Use:	Combined	**Pipe Shape:**	Rectangular
Type of Pipe:	Gravity drain/sewer	**Dia/Height:**	75 mm
Flow Control:	No flow control	**Material:**	
Year Constructed:	Not Specified	**Lining Type:**	No Lining
Inspection Purpose:	Routine inspection	**Lining Material:**	No Lining

Comments:
Recommendations:

Scale: 1:50	Position [m]	Code	Observation	MPEG	Photo	Grade
Depth: m RWP5						
	0.00	MH	Start node, manhole, reference: RWP5			
	0.00	SA	Survey abandoned: No access. Unable to survey		1	



Construction Features					Miscellaneous Features				
Structural Defects					Service & Operational Observations				
STR No. Def	**STR Peak**	**STR Mean**	**STR Total**	**STR Grade**	**SER No. Def**	**SER Peak**	**SER Mean**	**SER Total**	**SER Grade**
0	0.0	0.0	0.0	1.0	0	0.0	0.0	0.0	1.0

Section Pictures - 21/01/2026 - RWP5X

Item No.	Inspection Direction	PLR	Client`s Job Ref	Contractor`s Job Ref
14	Downstream	RWP5X		



1, 0.00 m
Survey abandoned, No access. Unable to survey

Disclaimer

Although every effort has been made to produce a thorough and precise report, Eyes On Drainage Services Ltd cannot be held liable for any descrepencies or omissions.
Furthermore Eyes On Drainage Services Ltd cannot be held responsible for any actions taken based on the information supplied within this report.

Appendix F Amber Ground Drainage Investigation

Amber Group

Date:	18th May 2026
Client:	Billy Nichols
Site:	47 Elmer Road, Bognor Regis, PO22 6ED, United Kingdom
Project:	Surface Water Drainage Investigation

15 West Street
Epsom, Surrey
KT18 7RL

[redacted]

Amber Group
15 West Street
Epsom Surrey
KT18 7RL

[redacted]

Billy Nichols
47 Elmer Road
Bognor Regis
PO22 6ED
United Kingdom

18th May 2026

Dear Billy Nichols,

Re: Drainage Assessment Report

Please find enclosed the Drainage Assessment Report for 47 Elmer Road, following the survey carried out on **13/05/2026.** The report is dated **18/05/2026** for your review and records.

The attached report outlines our engineer's findings from the drainage inspection together with any observations and recommendations identified during the survey.

Should you have any questions regarding the contents of the report, or if you would like us to provide a quotation for any recommended remedial works, please do not hesitate to contact us.

We trust the attached is in order and look forward to hearing from you.

Yours sincerely,

[redacted]

Mark Marsella

Contents

1. Introduction & Client Brief 4
2. Survey Methodology 4
3. Key Findings 4
4. CCTV Survey 5
5. Proposed Connection Details 5
6. Conclusion: 5

Report Date: 18/05/2026

Survey Date: 13/05/2026

Prepared By: Amber Group

1. Introduction & Client Brief

The client requested a survey to locate an existing surface water drain with the potential for a new connection as part of their proposed development. The objective was to identify a suitable point of connection, confirm the drainage type, record key measurements, and assess feasibility for a new surface water tie-in.

2. Survey Methodology

A visual inspection of the drainage infrastructure was carried out on site. This included:

- Identification and inspection of manholes and gullies.
- Measurement of invert levels and chamber dimensions.
- Cross-referencing with available asset location plans.
- Assessment of potential connection routes.

A CCTV survey was attempted but could not be completed due to operational constraints. Local utilities have been recommended to carry out further investigation.

3. Key Findings

- A surface water manhole was located on the public footpath.
- Confirmation that the chamber serves surface water was established by observing that both the road gully and pavement gully discharge into the manhole. These gullies are positioned approximately 500mm apart.
- Manhole Dimensions:
    - Width: 450mm
    - Length: 650mm
- Invert Level: 1.2m (measured to the outgoing pipe invert).
- The location of this surface water manhole has been cross-checked and confirmed against the client's drawings and asset location plans for the public surface water drainage network.

4. CCTV Survey

A CCTV survey was not possible at the time of inspection due to high water levels within the manhole. It is recommended that the local utilities company to attend to inspect.

5. Proposed Connection Details

- Approximate distance from the proposed development connection point to the identified surface water manhole: 22 metres.
- Recommended gradient: 1:40 (40/1 fall ratio) as per standard drainage guidelines for surface water pipes (subject to pipe diameter and local authority requirements).
- A fall of approximately 550mm over the 22m run would be required to achieve a 1:40 gradient.

Note: Exact connection details, pipe sizing, and final invert levels should be determined during detailed design, taking into account the proposed site levels and any upstream attenuation requirements.

6. Conclusion:

A viable surface water manhole has been identified on the public footpath, approximately 22 metres from the proposed development area. The chamber receives flows from both road and pavement gullies, confirming it forms part of the surface water network.

This report provides sufficient information for initial planning purposes. Further surveys and approvals will be necessary prior to construction.

Plumbing & Gas| Drainage |Electrical |Building & General Maintenance





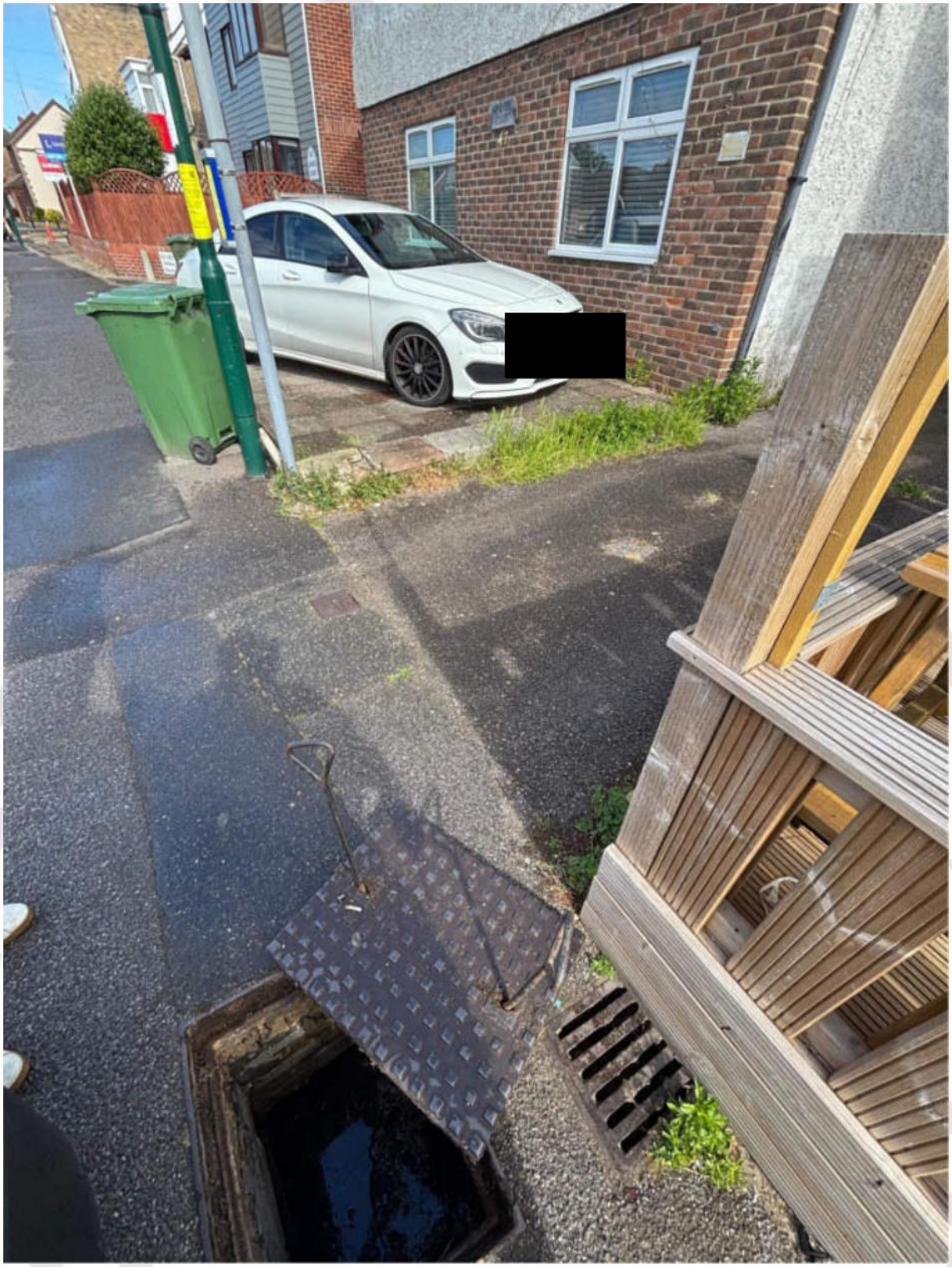
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Glow•worm
SafeContractor
Environment Agency
Which? Trusted trader







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Which? Trusted trader



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Glow-worm
Which? Trusted trader

Plumbing & Gas| Drainage |Electrical |Building & General Maintenance

Amber Group

Amber Group
15 West Street
Epsom Surrey
KT18 7RL

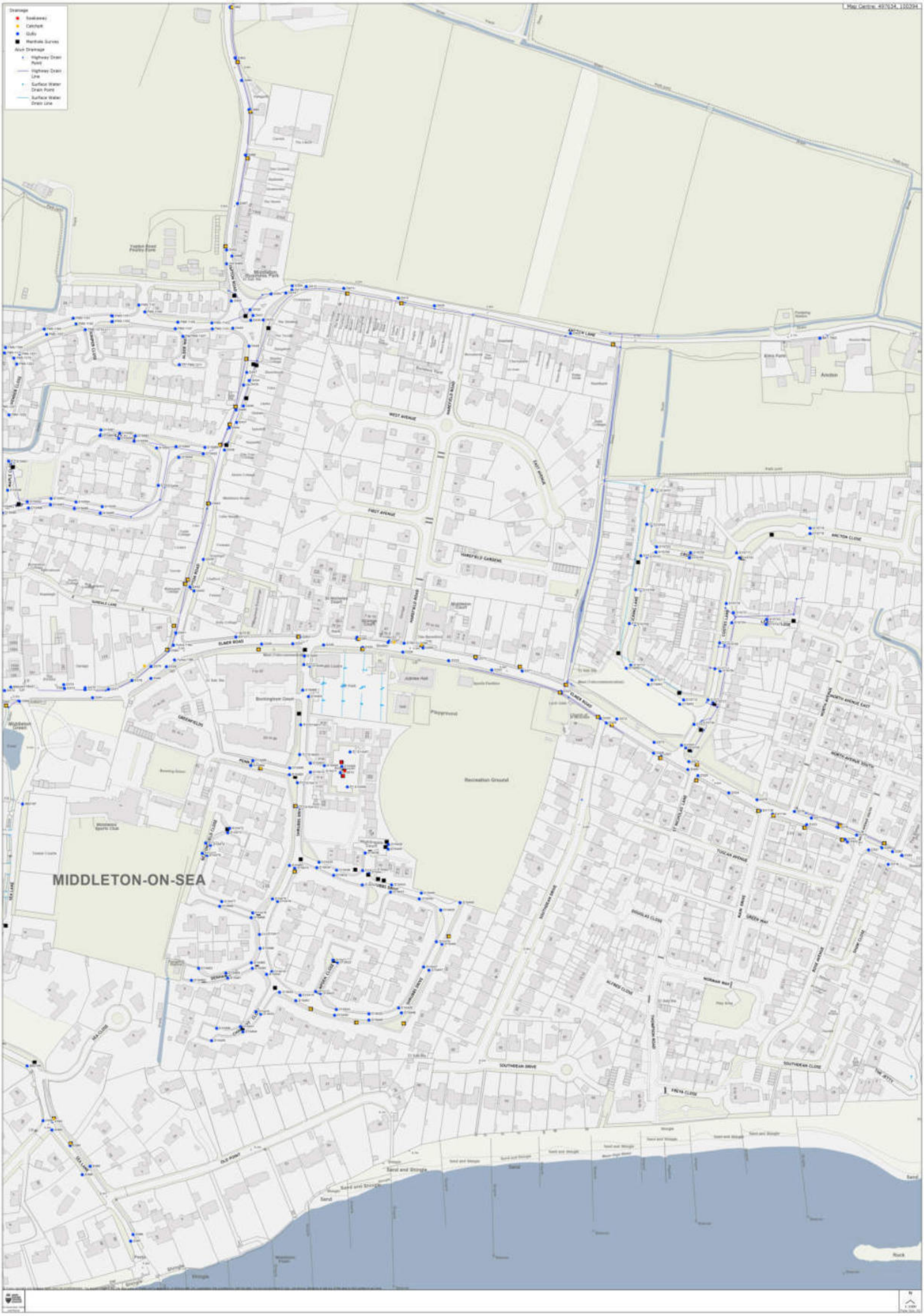
e [redacted]







Appendix G West Sussex County Council Highway Drainage Records



Map Centre: 497634, 100394
Drainage
Soakaway
Catchpit
Gully
Manhole Survey
Arun Drainage
Highway Drain Point
Highway Drain Line
Surface Water Drain Point
Surface Water Drain Line
MIDDLETON-ON-SEA
ANCTON LANE
WEST AVENUE
EAST AVENUE
FIRST AVENUE
HAREFIELD ROAD
HAREFIELD GARDENS
ELMER ROAD
GREENFIELDS
PENNS
ANCTON CLOSE
NORTH AVENUE EAST
NORTH AVENUE SOUTH
TUSCAN AVENUE
DOUGLAS CLOSE
GREEN WAY
ALFRED CLOSE
NORMAN WAY
SOUTHDEAN DRIVE
SOUTHDEAN CLOSE
FREYA CLOSE
SEA LANE
SEA CLOSE
OLD POINT
Recreation Ground
Playground
Middleton Sports Club
Sand and Shingle
Sand
Shingle
Rock

Appendix H Wallingford Greenfield Run-off 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	15/06/2026
Calculated by	BP Civils
Reference	D2317 Arundel Court
Model version	2.2.3

Location

Site name	D2317 Arundel Court
Site location	



Site easting (British National Grid)	497567
Site northing (British National Grid)	100410

Site details

Total site area (ha)	0.0570 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	773 mm		
BFIHOST19scaled	0.57		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	0.2 l/s		
QBar (FEH statistical 2025) (l/s)	0.2 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)	0.1 l/s
Flow rate 2 year (l/s)	0.2 l/s
Flow rate 10 years (l/s)	0.3 l/s
Flow rate 30 years (l/s)	0.4 l/s
Flow rate 100 years (l/s)	0.5 l/s
Flow rate 200 years (l/s)	0.6 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 (2.2.3) 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.

Greenfield runoff rate estimation tool

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

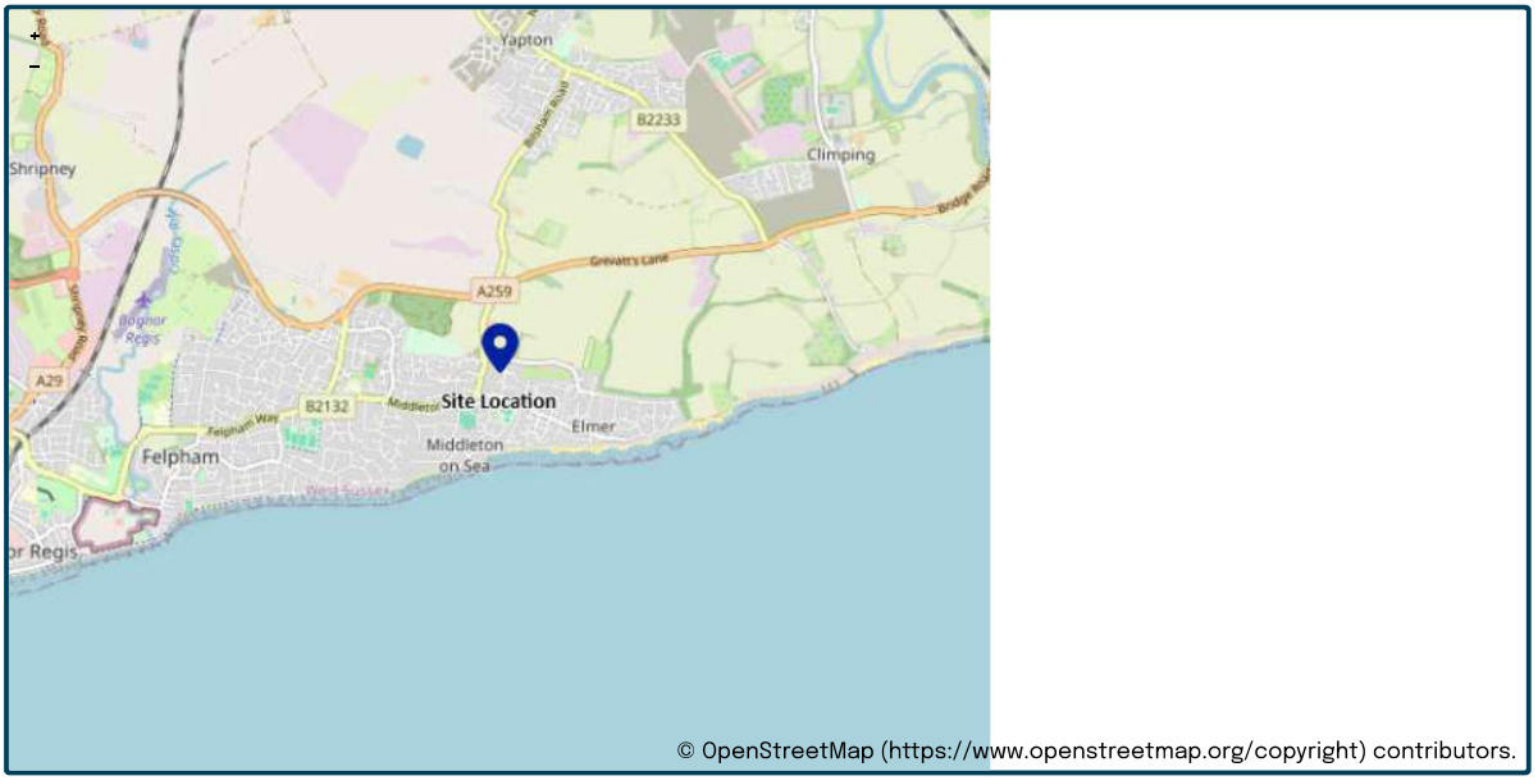
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	15/06/2026
Calculated by	BP Civils
Reference	D2317 Arundel Court
Model version	2.2.3

Location

Site name	D2317 Arundel Court
Site location	



Site easting (British National Grid)	497567
Site northing (British National Grid)	100410

Site details

Total site area (ha)	0.0518 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value
SAAR9120 (mm)	773 mm		
BFIHOST19scaled	0.57		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	0.1 l/s		
QBar (FEH statistical 2025) (l/s)	0.2 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)	0.1 l/s
Flow rate 2 year (l/s)	0.1 l/s
Flow rate 10 years (l/s)	0.3 l/s
Flow rate 30 years (l/s)	0.4 l/s
Flow rate 100 years (l/s)	0.5 l/s
Flow rate 200 years (l/s)	0.6 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.

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Appendix I Causeway Flow Hydraulic Calculations

Network Details

Manhole Schedule

Manhole	Catchment Area (ha)	Size (mm)	Type	CL (m)	IL (m)	Depth To Soffit (m)	Easting (m)	Northing (m)
S1	0.000	500	Unknown	5.150	4.300	0.700	497576.916	100434.404
S5	0.003	708x354	Unknown	5.000	4.670	0.180	497560.973	100405.186
S6	0.049	708x354	Unknown	4.700	4.070	0.480	497571.029	100399.395
S2	0.000	1200	Unknown	4.875	4.050	0.675	497570.361	100401.467
S8	0.000	0	Unknown	4.593	3.380	1.063	497569.722	100398.255

Pipe Schedule

Pipe Number	US Manhole	US IL (m)	DS Manhole	DS IL (m)	Shape	Dimension (mm)	Length (m)	Gradient (1:x)	Roughness (mm)	US Depth To Soffit (m)	DS Depth To Soffit (m)
1.000	S1	4.300	S2	4.050	Circ	150	33.583	134	0.600	0.700	0.675
2.000	S5	4.670	S6	4.070	Circ	150	11.604	19	0.600	0.180	0.480
2.001	S6	4.070	S2	4.050	Circ	150	2.176	109	0.600	0.480	0.675
1.001	S2	4.050	S8	3.380	Circ	150	3.274	5	0.600	0.675	1.063

Permeable Paving Schedule

Permeable Paving	Assigned Manhole	Effective Storage Volume (m3)	CL (m)	IL (m)	Storage Infil Rate (m/hr)	Safety Factor	Easting (m)	Northing (m)
Permeable Paving 2	S5	1.579	5.000	4.670	0.00000000	2.00	497562.959	100414.758
Permeable Paving 1	S6	34.565	4.700	4.070	0.00000000	2.00	497571.380	100437.522

Outfall Details

Outfall Manhole S8 : Free Discharge

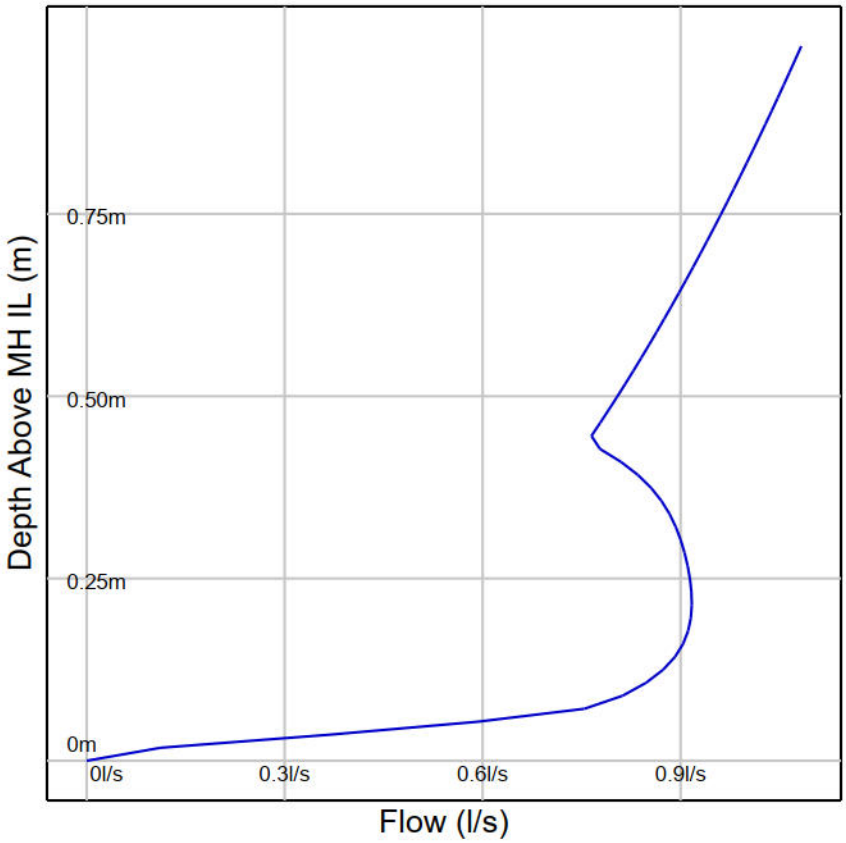
Flow Control Details

Controls within Manhole S2

Hydro-Brake® Optimum Control

Model Ref	Design Depth (m)	Design Flow (l/s)	Invert Offset (m)	FF Head (m)	FF Flow (l/s)	KF Head (m)	KF Flow (l/s)
SHE-0049-1000-0825-1000	0.825	1.000	0.000	0.216	0.917	0.436	0.758

Hydro-Brake® Optimum Control from S2 to S8



Simulation Settings

FEH2022 (point): Filename=FEH_Point_Descriptors_497567_100415_v5_1_0.xml
Summer (Cv: 1.00), Winter (Cv: 1.00)

Global Time of Entry: 5.0 mins

Durations (mins): 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Periods (yrs) + Climate Change: (1, +0%), (2, +0%), (10, +0%), (30, +0%), (30, +40%), (100, +0%), (100, +45%)

Manhole Flood Risk Freeboard: 0.300m

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
1Yr 15Min Winter	15.796	0.00	0.00	30Yr 720Min Winter	5.092	0.00	0.00
1Yr 15Min Summer	15.796	0.00	0.00	30Yr 960Min Summer	4.001	0.00	0.00
1Yr 30Min Winter	10.143	0.00	0.00	30Yr 960Min Winter	4.001	0.00	0.00
1Yr 30Min Summer	10.143	0.00	0.00	30Yr 1440Min Summer	2.857	0.00	0.00
1Yr 60Min Winter	6.394	0.00	0.00	30Yr 1440Min Winter	2.857	0.00	0.00
1Yr 60Min Summer	6.394	0.00	0.00	30Yr 2160Min Summer	2.055	0.00	0.00
1Yr 120Min Winter	5.125	0.00	0.00	30Yr 2160Min Winter	2.055	0.00	0.00
1Yr 120Min Summer	5.125	0.00	0.00	30Yr 2880Min Summer	1.637	0.00	0.00
1Yr 180Min Winter	4.311	0.00	0.00	30Yr 2880Min Winter	1.637	0.00	0.00
1Yr 180Min Summer	4.311	0.00	0.00	30Yr 4320Min Summer	1.210	0.00	0.00
1Yr 240Min Winter	3.575	0.00	0.00	30Yr 4320Min Winter	1.210	0.00	0.00
1Yr 240Min Summer	3.575	0.00	0.00	30Yr 5760Min Summer	0.991	0.00	0.00
1Yr 360Min Winter	2.781	0.00	0.00	30Yr 5760Min Winter	0.991	0.00	0.00
1Yr 360Min Summer	2.781	0.00	0.00	30Yr 7200Min Summer	0.857	0.00	0.00
1Yr 480Min Winter	2.307	0.00	0.00	30Yr 7200Min Winter	0.857	0.00	0.00
1Yr 480Min Summer	2.307	0.00	0.00	30Yr 8640Min Summer	0.766	0.00	0.00
1Yr 600Min Summer	1.962	0.00	0.00	30Yr 8640Min Winter	0.766	0.00	0.00
1Yr 600Min Winter	1.962	0.00	0.00	30Yr 10080Min Summer	0.700	0.00	0.00
1Yr 720Min Winter	1.707	0.00	0.00	30Yr 10080Min Winter	0.700	0.00	0.00
1Yr 720Min Summer	1.707	0.00	0.00	30Yr+40% 15Min Summer	114.997	0.00	0.00
1Yr 960Min Summer	1.380	0.00	0.00	30Yr+40% 15Min Winter	114.997	0.00	0.00
1Yr 960Min Winter	1.380	0.00	0.00	30Yr+40% 30Min Summer	76.197	0.00	0.00
1Yr 1440Min Summer	1.038	0.00	0.00	30Yr+40% 30Min Winter	76.197	0.00	0.00
1Yr 1440Min Winter	1.038	0.00	0.00	30Yr+40% 60Min Summer	48.291	0.00	0.00
1Yr 2160Min Summer	0.787	0.00	0.00	30Yr+40% 60Min Winter	48.291	0.00	0.00
1Yr 2160Min Winter	0.787	0.00	0.00	30Yr+40% 120Min Summer	29.396	0.00	0.00
1Yr 2880Min Winter	0.653	0.00	0.00	30Yr+40% 120Min Winter	29.396	0.00	0.00
1Yr 2880Min Summer	0.653	0.00	0.00	30Yr+40% 180Min Summer	21.704	0.00	0.00
1Yr 4320Min Summer	0.516	0.00	0.00	30Yr+40% 180Min Winter	21.704	0.00	0.00
1Yr 4320Min Winter	0.516	0.00	0.00	30Yr+40% 240Min Summer	17.390	0.00	0.00
1Yr 5760Min Summer	0.447	0.00	0.00	30Yr+40% 240Min Winter	17.390	0.00	0.00
1Yr 5760Min Winter	0.447	0.00	0.00	30Yr+40% 360Min Summer	12.606	0.00	0.00
1Yr 7200Min Winter	0.404	0.00	0.00	30Yr+40% 360Min Winter	12.606	0.00	0.00
1Yr 7200Min Summer	0.404	0.00	0.00	30Yr+40% 480Min Summer	9.987	0.00	0.00
1Yr 8640Min Summer	0.375	0.00	0.00	30Yr+40% 480Min Winter	9.987	0.00	0.00
1Yr 8640Min Winter	0.375	0.00	0.00	30Yr+40% 600Min Summer	8.306	0.00	0.00
1Yr 10080Min Winter	0.353	0.00	0.00	30Yr+40% 600Min Winter	8.306	0.00	0.00
1Yr 10080Min Summer	0.353	0.00	0.00	30Yr+40% 720Min Summer	7.129	0.00	0.00
2Yr 15Min Winter	32.583	0.00	0.00	30Yr+40% 720Min Winter	7.129	0.00	0.00
2Yr 15Min Summer	32.583	0.00	0.00	30Yr+40% 960Min Summer	5.602	0.00	0.00
2Yr 30Min Winter	21.091	0.00	0.00	30Yr+40% 960Min Winter	5.602	0.00	0.00
2Yr 30Min Summer	21.091	0.00	0.00	30Yr+40% 1440Min Summer	3.999	0.00	0.00
2Yr 60Min Summer	13.346	0.00	0.00	30Yr+40% 1440Min Winter	3.999	0.00	0.00
2Yr 60Min Winter	13.346	0.00	0.00	30Yr+40% 2160Min Summer	2.877	0.00	0.00
2Yr 120Min Summer	9.223	0.00	0.00	30Yr+40% 2160Min Winter	2.877	0.00	0.00
2Yr 120Min Winter	9.223	0.00	0.00	30Yr+40% 2880Min Summer	2.292	0.00	0.00
2Yr 180Min Summer	7.274	0.00	0.00	30Yr+40% 2880Min Winter	2.292	0.00	0.00
2Yr 180Min Winter	7.274	0.00	0.00	30Yr+40% 4320Min Summer	1.694	0.00	0.00
2Yr 240Min Winter	5.904	0.00	0.00	30Yr+40% 4320Min Winter	1.694	0.00	0.00
2Yr 240Min Summer	5.904	0.00	0.00	30Yr+40% 5760Min Summer	1.387	0.00	0.00
2Yr 360Min Summer	4.415	0.00	0.00	30Yr+40% 5760Min Winter	1.387	0.00	0.00
2Yr 360Min Winter	4.415	0.00	0.00	30Yr+40% 7200Min Summer	1.200	0.00	0.00
2Yr 480Min Summer	3.575	0.00	0.00	30Yr+40% 7200Min Winter	1.200	0.00	0.00
2Yr 480Min Winter	3.575	0.00	0.00	30Yr+40% 8640Min Summer	1.073	0.00	0.00

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
2Yr 600Min Summer	3.006	0.00	0.00	30Yr+40% 8640Min Winter	1.073	0.00	0.00
2Yr 600Min Winter	3.006	0.00	0.00	30Yr+40% 10080Min Summer	0.981	0.00	0.00
2Yr 720Min Winter	2.597	0.00	0.00	30Yr+40% 10080Min Winter	0.981	0.00	0.00
2Yr 720Min Summer	2.597	0.00	0.00	100Yr 15Min Summer	102.731	0.00	0.00
2Yr 960Min Summer	2.071	0.00	0.00	100Yr 15Min Winter	102.731	0.00	0.00
2Yr 960Min Winter	2.071	0.00	0.00	100Yr 30Min Summer	68.657	0.00	0.00
2Yr 1440Min Summer	1.515	0.00	0.00	100Yr 30Min Winter	68.657	0.00	0.00
2Yr 1440Min Winter	1.515	0.00	0.00	100Yr 60Min Summer	44.007	0.00	0.00
2Yr 2160Min Summer	1.121	0.00	0.00	100Yr 60Min Winter	44.007	0.00	0.00
2Yr 2160Min Winter	1.121	0.00	0.00	100Yr 120Min Summer	26.316	0.00	0.00
2Yr 2880Min Summer	0.916	0.00	0.00	100Yr 120Min Winter	26.316	0.00	0.00
2Yr 2880Min Winter	0.916	0.00	0.00	100Yr 180Min Summer	19.275	0.00	0.00
2Yr 4320Min Summer	0.705	0.00	0.00	100Yr 180Min Winter	19.275	0.00	0.00
2Yr 4320Min Winter	0.705	0.00	0.00	100Yr 240Min Summer	15.477	0.00	0.00
2Yr 5760Min Summer	0.596	0.00	0.00	100Yr 240Min Winter	15.477	0.00	0.00
2Yr 5760Min Winter	0.596	0.00	0.00	100Yr 360Min Summer	11.237	0.00	0.00
2Yr 7200Min Summer	0.530	0.00	0.00	100Yr 360Min Winter	11.237	0.00	0.00
2Yr 7200Min Winter	0.530	0.00	0.00	100Yr 480Min Summer	8.911	0.00	0.00
2Yr 8640Min Summer	0.484	0.00	0.00	100Yr 480Min Winter	8.911	0.00	0.00
2Yr 8640Min Winter	0.484	0.00	0.00	100Yr 600Min Summer	7.424	0.00	0.00
2Yr 10080Min Summer	0.451	0.00	0.00	100Yr 600Min Winter	7.424	0.00	0.00
2Yr 10080Min Winter	0.451	0.00	0.00	100Yr 720Min Summer	6.382	0.00	0.00
10Yr 15Min Summer	63.197	0.00	0.00	100Yr 720Min Winter	6.382	0.00	0.00
10Yr 15Min Winter	63.197	0.00	0.00	100Yr 960Min Summer	5.023	0.00	0.00
10Yr 30Min Summer	41.398	0.00	0.00	100Yr 960Min Winter	5.023	0.00	0.00
10Yr 30Min Winter	41.398	0.00	0.00	100Yr 1440Min Summer	3.584	0.00	0.00
10Yr 60Min Summer	26.153	0.00	0.00	100Yr 1440Min Winter	3.584	0.00	0.00
10Yr 60Min Winter	26.153	0.00	0.00	100Yr 2160Min Summer	2.567	0.00	0.00
10Yr 120Min Summer	16.400	0.00	0.00	100Yr 2160Min Winter	2.567	0.00	0.00
10Yr 120Min Winter	16.400	0.00	0.00	100Yr 2880Min Summer	2.033	0.00	0.00
10Yr 180Min Summer	12.289	0.00	0.00	100Yr 2880Min Winter	2.033	0.00	0.00
10Yr 180Min Winter	12.289	0.00	0.00	100Yr 4320Min Summer	1.483	0.00	0.00
10Yr 240Min Summer	9.867	0.00	0.00	100Yr 4320Min Winter	1.483	0.00	0.00
10Yr 240Min Winter	9.867	0.00	0.00	100Yr 5760Min Summer	1.200	0.00	0.00
10Yr 360Min Winter	7.195	0.00	0.00	100Yr 5760Min Winter	1.200	0.00	0.00
10Yr 360Min Summer	7.195	0.00	0.00	100Yr 7200Min Summer	1.027	0.00	0.00
10Yr 480Min Summer	5.723	0.00	0.00	100Yr 7200Min Winter	1.027	0.00	0.00
10Yr 480Min Winter	5.723	0.00	0.00	100Yr 8640Min Summer	0.910	0.00	0.00
10Yr 600Min Summer	4.767	0.00	0.00	100Yr 8640Min Winter	0.910	0.00	0.00
10Yr 600Min Winter	4.767	0.00	0.00	100Yr 10080Min Summer	0.826	0.00	0.00
10Yr 720Min Summer	4.095	0.00	0.00	100Yr 10080Min Winter	0.826	0.00	0.00
10Yr 720Min Winter	4.095	0.00	0.00	100Yr+45% 15Min Summer	148.960	0.00	0.00
10Yr 960Min Summer	3.227	0.00	0.00	100Yr+45% 15Min Winter	148.960	0.00	0.00
10Yr 960Min Winter	3.227	0.00	0.00	100Yr+45% 30Min Summer	99.552	0.00	0.00
10Yr 1440Min Winter	2.318	0.00	0.00	100Yr+45% 30Min Winter	99.552	0.00	0.00
10Yr 1440Min Summer	2.318	0.00	0.00	100Yr+45% 60Min Summer	63.810	0.00	0.00
10Yr 2160Min Summer	1.681	0.00	0.00	100Yr+45% 60Min Winter	63.810	0.00	0.00
10Yr 2160Min Winter	1.681	0.00	0.00	100Yr+45% 120Min Summer	38.158	0.00	0.00
10Yr 2880Min Summer	1.349	0.00	0.00	100Yr+45% 120Min Winter	38.158	0.00	0.00
10Yr 2880Min Winter	1.349	0.00	0.00	100Yr+45% 180Min Summer	27.949	0.00	0.00
10Yr 4320Min Summer	1.009	0.00	0.00	100Yr+45% 180Min Winter	27.949	0.00	0.00
10Yr 4320Min Winter	1.009	0.00	0.00	100Yr+45% 240Min Summer	22.441	0.00	0.00
10Yr 5760Min Summer	0.835	0.00	0.00	100Yr+45% 240Min Winter	22.441	0.00	0.00
10Yr 5760Min Winter	0.835	0.00	0.00	100Yr+45% 360Min Summer	16.294	0.00	0.00
10Yr 7200Min Summer	0.728	0.00	0.00	100Yr+45% 360Min Winter	16.294	0.00	0.00
10Yr 7200Min Winter	0.728	0.00	0.00	100Yr+45% 480Min Summer	12.921	0.00	0.00
10Yr 8640Min Summer	0.656	0.00	0.00	100Yr+45% 480Min Winter	12.921	0.00	0.00
10Yr 8640Min Winter	0.656	0.00	0.00	100Yr+45% 600Min Summer	10.764	0.00	0.00
10Yr 10080Min Summer	0.604	0.00	0.00	100Yr+45% 600Min Winter	10.764	0.00	0.00
10Yr 10080Min Winter	0.604	0.00	0.00	100Yr+45% 720Min Summer	9.254	0.00	0.00
30Yr 15Min Summer	82.140	0.00	0.00	100Yr+45% 720Min Winter	9.254	0.00	0.00
30Yr 15Min Winter	82.140	0.00	0.00	100Yr+45% 960Min Summer	7.283	0.00	0.00
30Yr 30Min Summer	54.427	0.00	0.00	100Yr+45% 960Min Winter	7.283	0.00	0.00
30Yr 30Min Winter	54.427	0.00	0.00	100Yr+45% 1440Min Summer	5.196	0.00	0.00
30Yr 60Min Summer	34.494	0.00	0.00	100Yr+45% 1440Min Winter	5.196	0.00	0.00
30Yr 60Min Winter	34.494	0.00	0.00	100Yr+45% 2160Min Summer	3.723	0.00	0.00
30Yr 120Min Summer	20.997	0.00	0.00	100Yr+45% 2160Min Winter	3.723	0.00	0.00
30Yr 120Min Winter	20.997	0.00	0.00	100Yr+45% 2880Min Summer	2.948	0.00	0.00

Simulated Rainfall Events

Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %	Storm	Average Intensity (mm/hr)	Runoff Continuity %	Flow Continuity %
30Yr 180Min Summer	15.503	0.00	0.00	100Yr+45% 2880Min Winter	2.948	0.00	0.00
30Yr 180Min Winter	15.503	0.00	0.00	100Yr+45% 4320Min Summer	2.151	0.00	0.00
30Yr 240Min Summer	12.421	0.00	0.00	100Yr+45% 4320Min Winter	2.151	0.00	0.00
30Yr 240Min Winter	12.421	0.00	0.00	100Yr+45% 5760Min Summer	1.740	0.00	0.00
30Yr 360Min Summer	9.005	0.00	0.00	100Yr+45% 5760Min Winter	1.740	0.00	0.00
30Yr 360Min Winter	9.005	0.00	0.00	100Yr+45% 7200Min Summer	1.490	0.00	0.00
30Yr 480Min Summer	7.133	0.00	0.00	100Yr+45% 7200Min Winter	1.490	0.00	0.00
30Yr 480Min Winter	7.133	0.00	0.00	100Yr+45% 8640Min Summer	1.320	0.00	0.00
30Yr 600Min Summer	5.933	0.00	0.00	100Yr+45% 8640Min Winter	1.320	0.00	0.00
30Yr 600Min Winter	5.933	0.00	0.00	100Yr+45% 10080Min Winter	1.197	0.00	0.00
30Yr 720Min Summer	5.092	0.00	0.00	100Yr+45% 10080Min Summer	1.197	0.00	0.00

Simulation Results

Return Period (yrs) + Climate Change (%):

1yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Winter	0	4.300	0.000	0.000		OK
S5	180 min Summer	101	4.675	0.005	0.086		OK
S6	360 min Summer	221	4.116	0.046	0.627		OK
S2	360 min Summer	221	4.117	0.067	0.627		OK
S8	360 min Summer	221	3.389	0.009	0.628		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	360 min Summer	221	S1	S2	0.033	0.000	0.000	0.000	OK
2.000	360 min Summer	218	S5	S6	0.025	0.068	0.072	0.002	OK
2.001	360 min Summer	221	S6	S2	0.056	0.285	0.835	0.049	OK
1.001	360 min Summer	221	S2	S8	0.009	1.445	0.628	0.008	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	180 min Summer	100	4.677	0.007	0.087			OK
Permeable Paving 1	360 min Summer	221	4.117	0.047	0.574			OK

Return Period (yrs) + Climate Change (%):

2yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Winter	0	4.300	0.000	0.000		OK
S5	120 min Summer	66	4.677	0.007	0.203		OK
S6	240 min Summer	159	4.156	0.086	0.825		OK
S2	240 min Summer	159	4.156	0.106	0.825		OK
S8	240 min Summer	159	3.390	0.010	0.824		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	240 min Summer	159	S1	S2	0.053	0.000	0.000	0.000	OK
2.000	240 min Summer	156	S5	S6	0.045	0.077	0.153	0.004	OK
2.001	240 min Summer	159	S6	S2	0.096	0.279	0.873	0.051	OK
1.001	240 min Summer	159	S2	S8	0.010	1.561	0.824	0.010	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	120 min Summer	66	4.681	0.011	0.203			OK
Permeable Paving 1	240 min Summer	159	4.156	0.086	0.777			OK

Return Period (yrs) + Climate Change (%):

10yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	0	4.300	0.000	0.000		OK
S5	30 min Summer	23	4.682	0.012	0.530		OK
S6	180 min Summer	140	4.237	0.167	0.910		Surcharged
S2	180 min Summer	140	4.237	0.187	0.910		Surcharged
S8	180 min Summer	140	3.391	0.011	0.910		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	60 min Summer	47	S1	S2	0.075	0.000	0.000	0.000	OK
2.000	180 min Summer	110	S5	S6	0.079	0.078	0.319	0.008	OK
2.001	180 min Summer	110	S6	S2	0.150	0.314	1.092	0.064	Surcharged
1.001	180 min Summer	140	S2	S8	0.011	1.608	0.910	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	30 min Summer	23	4.691	0.021	0.523			OK
Permeable Paving 1	180 min Summer	140	4.237	0.167	0.853			OK

Return Period (yrs) + Climate Change (%):

30yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	15 min Summer	0	4.300	0.000	0.000		OK
S5	30 min Summer	22	4.683	0.013	0.694		OK
S6	180 min Winter	156	4.296	0.226	0.916		Surcharged
S2	180 min Winter	156	4.295	0.245	0.916		Surcharged
S8	360 min Summer	304	3.391	0.011	0.917		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	30 min Summer	26	S1	S2	0.075	0.000	0.000	0.000	OK
2.000	60 min Summer	42	S5	S6	0.081	0.158	0.639	0.016	OK
2.001	30 min Winter	31	S6	S2	0.150	0.547	1.534	0.090	Surcharged
1.001	360 min Summer	304	S2	S8	0.011	1.611	0.917	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	30 min Summer	22	4.694	0.024	0.693			OK
Permeable Paving 1	180 min Winter	156	4.296	0.226	0.855			OK

Return Period (yrs) + Climate Change (%):

30yr+40%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	240 min Winter	220	4.417	0.117	0.000		OK
S5	30 min Summer	21	4.686	0.016	1.016		OK
S6	240 min Winter	220	4.417	0.347	0.872		Flood Risk
S2	240 min Winter	220	4.417	0.367	0.872		Surcharged
S8	1440 min Summer	837	3.391	0.011	0.917		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	240 min Winter	320	S1	S2	0.133	0.003	0.030	0.002	OK
2.000	60 min Summer	37	S5	S6	0.083	0.139	0.890	0.022	OK
2.001	15 min Winter	20	S6	S2	0.150	0.680	2.018	0.119	Surcharged
1.001	1440 min Summer	837	S2	S8	0.011	1.611	0.917	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	30 min Summer	21	4.701	0.031	1.035			OK
Permeable Paving 1	240 min Winter	220	4.417	0.347	0.821			OK

Return Period (yrs) + Climate Change (%):

100yr+0%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	240 min Winter	207	4.368	0.068	0.000		OK
S5	30 min Summer	22	4.685	0.015	0.890		OK
S6	240 min Winter	207	4.368	0.298	0.898		Surcharged
S2	240 min Winter	207	4.368	0.318	0.899		Surcharged
S8	480 min Summer	522	3.391	0.011	0.917		Outfall

Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	240 min Winter	248	S1	S2	0.109	0.003	0.030	0.002	OK
2.000	60 min Summer	38	S5	S6	0.082	0.143	0.806	0.020	OK
2.001	15 min Winter	23	S6	S2	0.150	0.665	2.119	0.125	Surcharged
1.001	480 min Summer	522	S2	S8	0.011	1.611	0.917	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	30 min Summer	21	4.699	0.029	0.939			OK
Permeable Paving 1	240 min Winter	207	4.368	0.298	0.842			OK

Return Period (yrs) + Climate Change (%):

100yr+45%

Manholes

Manhole	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Status
S1	240 min Winter	233	4.556	0.256	0.000		Surcharged
S5	30 min Summer	21	4.689	0.019	1.421		OK
S6	240 min Winter	233	4.556	0.486	0.803		Flood Risk
S2	240 min Winter	233	4.556	0.506	0.803		Surcharged
S8	2160 min Summer	1473	3.391	0.011	0.917		Outfall

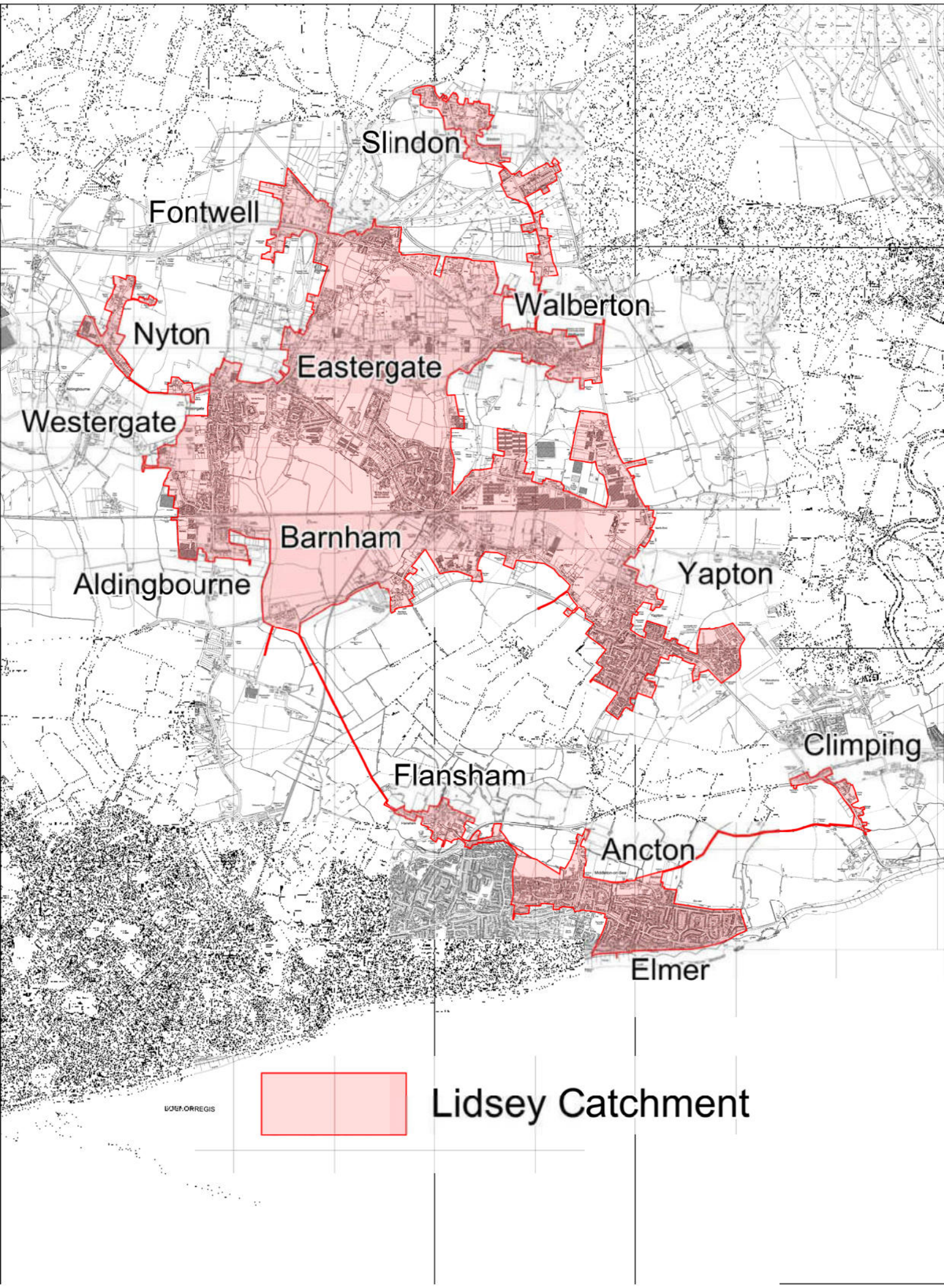
Conduits

Pipe No.	Critical Storm	Peak (mins)	US Manhole	DS Manhole	Flow Depth (m)	Max Velocity (m/s)	Max Flow (l/s)	Flow / Capacity	Status
1.000	360 min Winter	645	S1	S2	0.150	0.003	0.030	0.002	Surcharged
2.000	30 min Summer	23	S5	S6	0.084	0.233	1.426	0.035	OK
2.001	15 min Winter	19	S6	S2	0.150	0.690	2.217	0.131	Surcharged
1.001	2160 min Summer	1473	S2	S8	0.011	1.611	0.917	0.011	OK

Permeable Paving Storage

Permeable Paving	Critical Storm	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Flood (m3)	Surface Runoff (m3)	Status
Permeable Paving 2	30 min Summer	21	4.708	0.038	1.318			OK
Permeable Paving 1	240 min Winter	233	4.557	0.487	0.768			OK

Appendix J Lidsey Drainage Catchment Area Plan


Slindon
Fontwell
Walberton
Nyton
Eastergate
Westergate
Barnham
Aldingbourne
Yapton
Climping
Flansham
Ancton
Elmer
Lidsey Catchment