Land Science

56 THE MEADWAY, SHOREHAM BY SEA, BN43 5RP

PHASE I AND II GEOTECHNICAL ASSESSMENT

MR AND MRS GUNZI

7TH DECEMBER 2022

LS6595

Site:	**56 THE MEADWAY, SHOREHAM-BY-SEA, BN43 5RP**
Title:	**PHASE I AND II GEOTECHNICAL ASSESSMENT**
Project:	**RESIDENTIAL DEVELOPMENT**
Client:	**MR AND MRS GUNZI**
Contact:	**INGS ENGINEERING**
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1.0 EXECUTIVE SUMMARY

This summary is a brief precis of the main findings and conclusions of the investigation. For detailed information, the reader is referred to the main report.

The existing site comprised a single storey residential dwelling with front driveway and rear private garden. The proposed development was understood to comprise the demolition of the existing dwelling and the construction of a new two storey residential dwelling. The intrusive investigation included 1 borehole, 2 hand pits and 1 trial pit.

Strata	Base Depths (m)	Summary
Topsoil	0.05-0.30	Dark brown, black sandy, slightly gravelly SILT. Gravels are of flint.
Made Ground	0.30	Dark brown, black, sandy, gravelly, clayey SILT or sandy GRAVEL. Gravels are of flint, brick, concrete, and mortar with rare carpet fragments.
Storm Beach Deposits	4.00+	Light orange brown GRAVEL. Gravels are of flint.

No groundwater encountered within 4.00m depth

A raft foundation is likely to be suitable to the ground and groundwater conditions, and suggested design parameters are given.

Excavations are generally likely to be unstable. Excavations below the water table may become highly unstable.

Pavements may be formed on the Storm Beach Deposits. A CBR value of 60.0% is recommended for the storm beach deposits, which is classified as being frost susceptible.

Buried structural concrete may be designed to DS-1 and AC-1 in accordance with BS8500. Water supply pipe work will not require protection from aggressive soil contaminants.

Soakage testing identified that soakaways would perform satisfactorily on site, with an estimated soil infiltration rate of $3.1\text{-}3.9 \times 10^{-2}$ m/s.

No Radon Protection Measures (RPM) are required for new dwellings and extensions at this location.

A preliminary screening of the WAC results identified elevated levels of contamination. Recommendations for remediation and/or further testing have been identified.

Chemical results on the Made Ground corresponded to Stable Non-Reactive Hazardous Waste classification. Natural soils are anticipated to generally be Inert Waste.

No requirements for further ground investigation have been identified, however, further soils testing has been recommended to evaluate the extent of any contamination present on site, in the absence of this recommendations for remediation have also been made. This report should be submitted to relevant authorities etc in good time for consideration and approval.

2.0 INTRODUCTION

2.1 General

Land Science was instructed to undertake a Combined Phase I and Phase II Geotechnical Assessment in relation to the proposed residential redevelopment at 56 The Meadway, Shoreham-By-Sea, BN43 5RP. The location is shown on Figure 1, which is centred at grid reference TQ 22157 04676.

2.2 Client

The Clients for this appointment were Mr and Mrs Gunzi through their engineer Ings Engineering. This report may only be used by this named client and their project team for the purposes set out and subject to the report conditions. It was understood that the Client already owned the property, and that this investigation was not a pre-purchase appraisal.

2.3 Area Under Investigation

The area under investigation comprised a single residential dwelling with associated front driveway and rear private garden. The layout is indicated on Figure 2, and a walkover survey is presented in section 3.0. The area was approximately 0.04 hectares.

2.4 Proposed Development

The proposed development was understood to comprise the demolition of the existing dwelling and the construction of a new two storey residential dwelling in the same footprint with associated parking and soft landscaping. The proposed development was covered under planning application number AWDM/0039/22. Figure 3 illustrates the layout of the proposed redevelopment. The findings of this report may be not valid if the proposed development is altered.

2.5 Previous Investigations

Land Science was not aware of any previous desk studies or ground investigation(s) for this project.

2.6 Scope of Work

The work carried out is described in detail in following sections but in summary included:

- A phase I assessment desk study.
- An intrusive investigation comprising dynamic sampler boreholes, trial pits, and soakage testing.
- Preliminary geotechnical testing of selected soil samples in the field and laboratory.
- Preliminary chemical testing of selected soil samples in the laboratory.
- Installation of water monitoring wells and return visits. Monitoring to include 6 return visits and the installation of water loggers for a period of 6 months.

The fieldwork was conducted on the 15th of November 2022, under the supervision of Land Science. The first monitoring visit was carried out on the 30th of November, a further 5 are scheduled over the following 5 months.

2.7 Geotechnical Objectives

An interpretive Ground Investigation Report (GIR) was required in order to provide an assessment of ground conditions with respect to proposed foundations, pavements, soakaways, concrete specification and excavations.

2.8 Standards

Where practicable, the investigation was undertaken in accordance with the following primary standards and guidance:

- BS 5930:2015 Code of Practice for Site Investigations
- BS 1377:2018 Soils for Civil Engineering Purposes
- BS 8004:2015 Code of Practice for Foundations
- BS EN 1997-2:2007. Eurocode 7: Geotechnical Design – Part 2: Ground Investigation and testing.

Other technical sources have been cited in respect of specific aspects of the investigation, as referenced throughout the text.

3.0 DESK STUDY

3.1 General

A desk study was carried out to inform the preliminary conceptual understanding of the site and its setting, and to identify potential aspects of concern, in the context of the stated report objectives.

3.2 Walkover Survey

A walkover survey was carried out, as recorded in Appendix A, with photographs from the site in Appendix B. In summary, the area under investigation comprised a single storey residential dwelling with a private garden and driveway area at the front of the property. The site was occupied at the time of the walkover. Small trees were noted in the front driveway and forming the borders in the rear garden. These ranged in height between 1.00-3.00m in height.

With the exception of trees, the walkover survey did not identify any areas of particular concern regarding the geotechnical condition of the site. No significant evidence of underground structures, ground instability, subsidence, wet areas, significant earthworks, etc, were noted.

The walkover survey did not identify any areas of particular concern regarding the geo-environmental condition of the site. No significant evidence of tanks, chemical storage, staining or sheens, built up ground, contaminative land uses etc, were noted.

3.3 Historical Land Use Data

Various historical records were reviewed in order to assess potential historical land uses and activities that may impact on ground conditions at the site.

A set of historical ordnance survey maps was obtained from Envirocheck, and a copy is presented in Appendix F. The following key features were noted:

- The earliest map dated 1875 showed the site comprised part of an open area of shingle beach located between the sea to the south, and the River Adur to the north.
- The 1931 map showed the site to be redeveloped with a residential dwelling, with space for a private garden to the north. This site layout is commensurate with that of the present day. Maps dated from 1952 to 1970 had marked the property *White Timbers.*
- Off site, the 1873 map showed the site to be surrounded by open space, likely shingle. The 1898 map showed a small building marked a cholera hospital located ~200m to the northeast of the site, an exercise post for lifeguards marked 150m to the west and a rifle range marked 100m to the west of the site however no boundary showing the extent of the range was shown.
- The 1912 map showed a tramway running from the northwest to the southeast ~70m to the east of the site.
- The 1952 map showed the start of residential development in the area surrounding the site, this continued over time until the layout became commensurate with the present day in 1977.

- The historical map set included an aerial photograph dated 1999. The quality of imagery was not sufficient to discern any land use features on site.

Recent aerial photography covering the site was examined using Google Earth Pro. The imagery identified that the site had been in a similar layout to the present day since the earliest high quality imagery published in 2001.

A brief internet search was carried out, which did not immediately reveal any relevant land use information.

3.4 Ground Conditions

A preliminary ground model was derived for the site by based on a combination of various sources including published maps, borehole records, previous investigations, and the site history. In summary, the following potential ground model was identified:

Strata	Approximate Depth (mbgl)	Summary Description
Made Ground	<1.00	The site has been subject to previous development and there is a potential for construction and demolition wastes, imported fill materials, and zones of disturbed ground, etc.
Storm Beach Deposits	8.00-10.00	Comprise a low rounded ridge of coarse materials including gravels, cobbles and boulders piled up by very powerful storm waves at the inland margin of a beach, above the level reached by normal spring tides.
Tarrant Chalk Member	To depth	Soft white chalk with relatively widely spaced but large flint seams.

No groundwater strikes were recorded in nearby historical borehole records obtained from the BGS. Given the granular nature of the overlying storm beach deposits and the chalk present beneath, a shallow groundwater table is not anticipated.

The desk study included searches of geological hazards. None of the hazards were rated as moderate or above, considered the screening threshold for further investigation.

A search of various databases for coal mining, mining, brine compensation, and natural cavities was carried out. No relevant features were identified.

3.5 Environmental Setting

The site lies in the following groundwater setting:

- Superficial aquifer: The Storm Beach Deposits were classified as a Secondary A - Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
- Bedrock aquifer: The Tarrant Chalk Member was classified as a Principal Aquifer - strata that have high inter-granular and/or fracture permeability, usually providing a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

- Source protection zone: None - no groundwater Source Protection Zones were identified on site or in the vicinity.
- Flooding from Rivers and Sea: the site was noted to lie on the boundary between flood zone 1 and flood zone 2.
    - Zone 1 Low Probability - Land having a less than 1 in 1,000 annual probability of river or sea flooding.
    - Zone 2 Medium Probability - Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
- Surface water flooding on site: Medium risk - each year this area has a chance of flooding of between 1% and 3.3%. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding.

3.6 Radon Gas

The requirement for Radon Protection Measures (RPM) has been assessed in accordance with BRE 211:2015. Public Health England and the BGS estimate the potential for radon and the requirement for Radon Protection Measures on site as follows:

- Radon probability: Low probability - between 1% and 3% of homes are estimated by PHE to exceed the threshold for Radon gas in residential dwellings.
- Radon Protection Measures (RPM): No Radon protection is required for new dwellings or extensions constructed at this location.

4.0 INTRUSIVE INVESTIGATION

4.1 Investigation Strategy

Based on the geotechnical objectives, the intrusive investigation was based on the following strategy:

- Dynamic sampler boreholes were used to minimise disruption to the site and to enable monitoring wells to be installed.
- The positions were located to give broad coverage across the site. Two positions were to be drilled in the front driveway with two further positions drilled in the rear garden.
- Dynamic probing was to be carried out at each dynamic sampler position in order to provide a profile of soil density with depth.
- A trial pit was dug to allow full scale BRE365 soakage testing to be undertaken
- A monitoring well was installed in DS01. The installation was sealed through the Made Ground, with the response zone in the Storm Beach Deposits.

Due to access restrictions to the rear of the property, the dynamic samplers in the rear garden were replaced with a hand pit. Time constraints also meant that instead of a second window sampler borehole being dug on the front drive, a second hand pit was dug in place of DS02. These changes will have no significant impact on the findings of the ground investigation.

Position	Provisional Depth / strata	Existing Location	Proposed Location	Testing, installations etc
DS01	5.00m or refusal	Front Driveway	Same as existing	MW, DP01
HP01	1.00m	Front Driveway	"	DP02
HP02		Rear Garden	"	-
TP01	1.00-2.00m	Front Driveway	"	BRE365

4.2 Dynamic (Windowless) Sampling (DS)

Dynamic Sampling entails 1m long hollow tubes with liners driven into the ground and retracted to obtain samples. The liners are split, logged, tested, and subsampled as required.

4.3 Dynamic Probing (DP)

Dynamic Probing involves driving a cone point using a percussive hammer and recording the number of blows required for each increment of penetration. The particular testing method employed was DPSH-A as prescribed under BS EN 1997-:2004 and EN ISO 22476-2.

4.4 Trial Pits (TP)

Trial pits are open excavations using a mechanical excavator to inspect a larger volume of soils and in turn provide a better understanding of variability water ingress, instability, etc.

4.5 Hand Pits (HP)

Hand excavated trial pits provide a low cost and low impact method of sampling shallow soils.

4.6 Full Scale Soakage Testing (BRE365)

Full scale soakage tests were undertaken in accordance with BRE365. The test was carried out in open holes in one day with only one repeat test possible in the time available.

4.7 Monitoring Wells (MW)

Monitoring wells are installations within boreholes that enable return monitoring to be carried out. The pipework was 50mm diameter HDPE, with cased section sealed with bentonite, and the slotted response zone packed with a shingle filter pack.

Monitoring installations are summarised below and are shown on the relevant logs in the appendix.

Position	Response zone		Diameter	Strata	Objective
	Top	Bottom			
DS01	1.00m	4.00m	50mm	Storm beach deposits	Water monitoring and automatic water level logger installation

4.8 Automatic Water Level Loggers

A Rugged Troll 200 was installed in DS01 to a depth of 3.70m. A separate BaroTroll 100 was installed under the cover. The units were set to record at twice daily intervals over a period of 6 months.

4.9 Soil Sampling

Soil samples were recovered from the exploratory holes during the ground investigation and stored/transported in containers appropriate for the laboratory testing undertaken. Sample types and depths are recorded on the relevant exploratory hole records.

4.10 Post-Fieldwork Monitoring

Post-fieldwork monitoring of groundwater has been undertaken on one occasion to date, the 30th of November 2022, with a further 5 manual groundwater visits due to take place on a monthly basis.

4.11 Groundwater Sampling

Groundwater samples were recovered from the wells using dedicated bailers and stored/transported in containers appropriate for the laboratory testing undertaken.

5.0 GROUND CONDITIONS

5.1 General

The expected ground conditions were anticipated to comprise Made Ground over Storm Beach Deposits over Tarrant Chalk to depth. Made Ground was encountered over Storm Beach Deposits; however, the chalk was not proved during the investigation. A thin capping of topsoil and hardstandings was encountered at positions HP01 and TP01, respectively. A summary of the encountered conditions is presented below.

Strata	Base Depth (m)			
	DS01	HP01	HP02	TP01
Hardstanding	-	-	-	0.05
Topsoil	-	0.05	0.30	-
Made Ground	0.30	-	-	0.30
Storm Beach Deposits	4.00+	0.50+	0.50+	0.60+

The naming of geological strata is tentative and should be used as a guide. Interpolation between or below investigation points should be treated with caution. The description of soils and rocks was in accordance with BS5930.

Topsoil can be distinguished from Made Ground, even though these may have been disturbed through human activity and may contain materials such as brick, pottery, or charcoal etc.

5.2 Hardstandings

Position TP01 was located within the driveway; a concrete paving slab was encountered to a depth of 0.05mbgl.

5.3 Topsoil

Topsoil was encountered to depths of between 0.05 and 0.30m and in summary comprised a dark brown, black sandy, slightly gravelly (HP02) SILT. Sands are fine to medium, and in the case of HP02, gravels are fine to coarse subangular to subrounded flints.

5.4 Made Ground

Made Ground was encountered to base depths of 0.30m. In DS01 the made ground comprised a dark brown, black, sandy, gravelly, clayey SILT, where sands are fine to medium, and gravels are fine, subangular to subrounded flint with rare carpet fragments. In TP01 the Made Ground comprised a light grey brown, sandy GRAVEL, where sands are fine to coarse and gravels are fine to coarse subangular to subrounded brick, concrete and mortar.

5.5 Storm Beach Deposits

Storm Beach Deposits were encountered in all positions to depth. They generally comprised of light orange brown GRAVEL where the gravels are of fine to coarse subangular to subrounded flints.

5.6 Roots and Rootlets

Position	Roots	Rootlets
DS01	None	0.00-0.30m; abundant rootlets noted throughout
HP01	"	0.00-0.05m; abundant rootlets noted throughout
HP02	"	0.00-0.30m; rootlets noted throughout
TP01	"	0.05-0.30m; abundant fine rootlets noted

5.7 Field Evidence of Contamination

No evidence of possible soil contamination (such as staining, malodours, or brightly coloured soils) was identified in the field.

Made Ground was identified to base depths of 0.30m, and such materials may be imported from an unknown source or mixed with hazardous materials, and as such may contain a wide range of potential contaminants. All such materials should be treated as suspect unless proven otherwise. Preliminary testing has been carried out, as described in section 10.0.

5.8 Groundwater

Groundwater was not encountered during excavation of any of the investigative positions.

The level of water in a borehole can be affected by the drilling process and speed of infiltration; short-term rest levels should be used with caution.

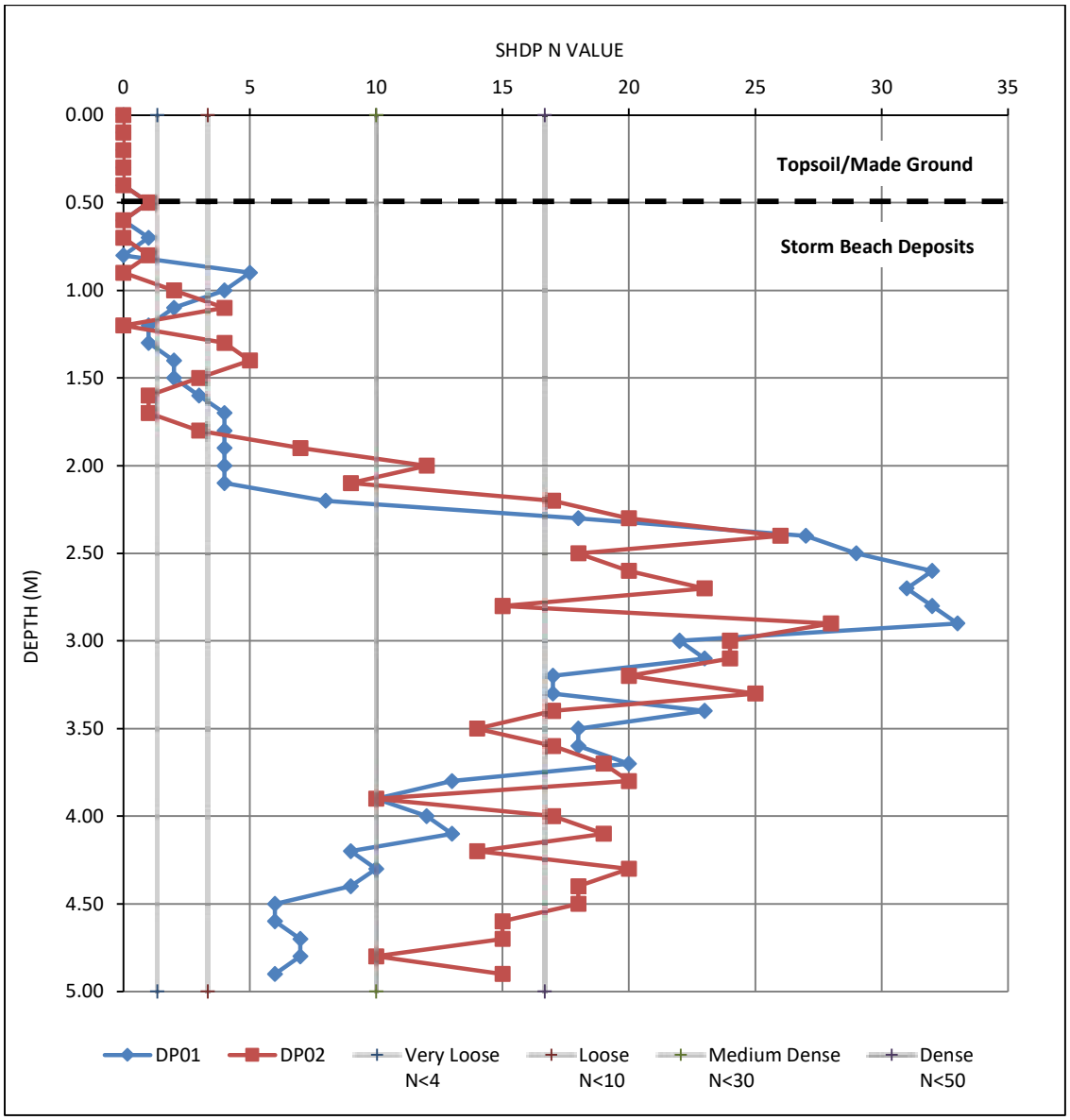
5.9 Stability and Casing

DS01 was cased to 3.00m and was terminated at 4.00m due to a collapse within the sands and gravels.

6.0 FIELD TESTING

6.1 Super Heavy Dynamic Probing (SHDP)

The results in the Storm Beach Deposits typically ranged between N=1 and N=5 up to 2.00m depth, increasing to between N=15 and N=33 between depths of 2.00-3.50m representing a band of dense gravels. The results then reduced to values of between N=6 and N=15 at depths of 5.00m.



6.2 Full Scale Soakage Testing (BRE365)

Full scale soakage tests were undertaken in TP01 in accordance with BRE365. The test was carried out in an open hole in one day with three repeat tests possible within the time on site. No head of water was achieved during the testing, with 600L of water infiltrating into the pit in times of 48-, 60- and 49-seconds during tests 1, 2 and 3 respectively. These correspond to infiltration rates of 10.0-12.5 l/s or $3.1\text{-}3.9 \times 10^{-2}$ m/s (calculated using surface area being the base alone). These values are typical and representative for the storm beach deposits.

7.0 MONITORING DATA

7.1 Groundwater Monitoring

No groundwater was encountered during the first return monitoring visits.

Position	During drilling	Return monitoring
DS01	Dry	Dry

7.2 Water Loggers

Automatic water level loggers were installed and set up to measure groundwater levels twice daily for a period of 6 months.

The report will be updated with the results of the automatic water logging after the monitoring period is complete.

8.0 GEOTECHNICAL LABORATORY TESTING

8.1 Geotechnical Laboratory Testing

Samples were selected for geotechnical testing, based on the following rationale:

- For general classification purposes, representative samples of granular soils were selected for Particle Size Distribution by wet sieving (PSD).
- To determine the required concrete specification to resist chemical attack, samples were tested for pH and soil soluble sulphate (pH/SO4).

A summary of the testing scheduled is given below:

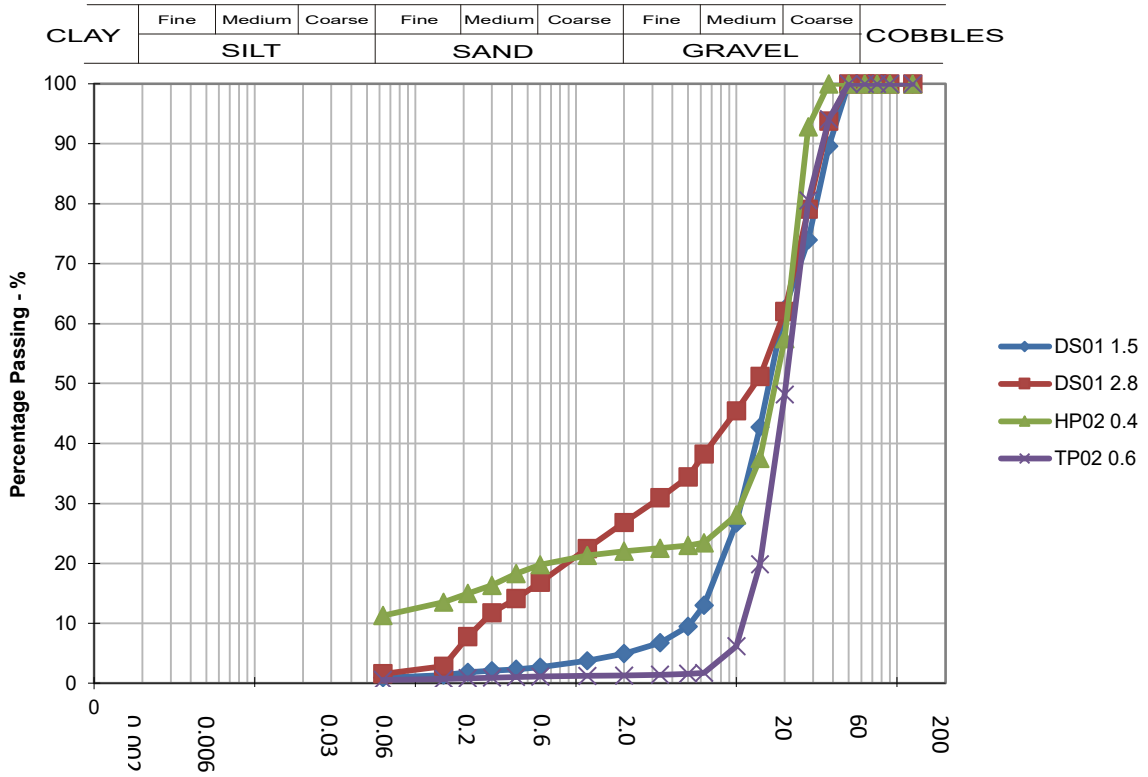
Sample	Strata	Test	
		PSD	pH/SO4
DS01, 1.50m	Storm Beach Deposits	✓	
DS01, 2.20m			✓
DS01, 2.80m		✓	
HP01, 0.50m			✓
HP02, 0.40m		✓	
TP01, 0.60m		✓	

The results are discussed in the relevant sections.

8.2 Particle Size Distribution

Particle Size Distribution analysis was performed on representative samples of more granular materials as summarised below.

Strata	No. of tests	% Clay/Silt	% Sand	% Gravel	% Cobbles
Storm Beach Deposits	4	0.6-11.3	0.7-25.2	73.2-98.7	-



8.3 pH and Sulphate

Geochemical testing for water soluble Sulphate and pH were undertaken, and the results are summarised on the following table.

Strata	No. of tests	Water soluble Sulphate (SO_4 g/l)	pH (value)
Made Ground	1	0.047	8.5
Storm Beach Deposits	2	0.0072-0.027	8.3-8.7

9.0 GEOTECHNICAL ASSESSMENT

9.1 General

The proposed development was understood to comprise the demolition of the existing dwelling on site and the construction of a new two-storey residential dwelling with associated parking and private garden to the rear.

Groundwater was not encountered within the boreholes or monitoring wells. The maximum depth of investigation was 4.00mbgl, and water may occur below this depth. The site lies in an area susceptible to river flooding (albeit at a low risk), which should be considered as a potential construction hazard and in the overall design.

Based on the ground and groundwater conditions encountered, it is considered that a raft foundation would be appropriate for the proposed development. Traditional strip and pad foundations may also be considered, but the upper parts of the Storm Beach Deposits were relatively loose, meaning footings would be relatively wide

The final foundation scheme will depend on other constraints and should be evolved in consultation with the design team.

9.2 Volume Change Potential

Reference may be given to the NHBC standards or similar guidance for designing and constructing foundations in the zone of influence of trees and hedgerows that currently exist, are to be planted, or have recently been felled.

Strata	Modified PI'	Shrinkability classification
Storm Beach Deposits	Not plastic	Not susceptible to significant volume change

Soils are unlikely to be susceptible to significant volume change potential. The modified plasticity index tests were below 10%. Heave protection measures will therefore not be required, although all foundations should extend below any major root zones encountered.

9.3 Raft Foundations

Reference should be made to the NHBC Standards (especially chapter 4.4) when designing raft foundations.

The Storm Beach Deposits are classified as being potentially frost susceptible, and protection of the raft should be considered. For instance, a minimum 600mm deep slab thickening might be constructed around the perimeter ("frost curtain") with the granular infill beneath the slab extending to at least the same depth.

The formation level is anticipated to comprise Storm Beach Deposits at a depth in the order of 0.60-1.00m. Any Made Ground and any soft or loose zones should be replaced with granular fill well-

compacted to a suitable specification. If necessary, further granular fill may be placed across the formation.

Integral pad and strip foundations within the raft may be designed based on a maximum net allowable bearing capacity of 80 kN/m^2. The overall slab should not exceed an overall maximum net allowable bearing capacity of 40 kN/m^2. The raft should be of a suitable thickness and reinforced to be suitably rigid.

Where used in the design of a raft foundation, typical published values for the Modulus of Subgrade Reaction range between 6000 kN/m^3 and 12000 kN/m^3. A range of values should be evaluated, and the resulting design should be checked to ensure it is sensible.

Traditional strip and pad foundations may also be designed to the same values. They may be improved by founding deeper at say 1.50-2.00m but the Storm Beach Deposits may become unstable which could be problematic.

9.4 Excavations

The risks arising from excavation works should be properly assessed and appropriate safety precautions should be adopted. Reference may be made to various guidance including BS8000-1:1989, BS6031:2009 and CIRIA C97.

The likelihood of excavation instability through different strata has been assessed as summarised below. It should be noted that all open unsupported excavations have the potential to collapse.

Strata	Stability
Topsoil/Made Ground	Generally unstable. May be battered back to a safe angle. Deeper excavations may require trench support.
Storm Beach Deposits	Marginally stable in the short term. Spalling and collapse should be expected, particularly in long or deep excavations which are left open for prolonged periods.

Excavations which are to remain open for prolonged periods will require trench support.

All excavations taken beneath the water table are likely to become highly unstable. Significant collapse and over-dig expected. Dewatering and full-trench support may need to be considered.

It is considered that normal-rated plant and machinery will be sufficient for undertaking excavations. Breakers will be required for removing any former foundations, retaining walls etc. Care should be taken so as not to undermine existing structures, services, or adjacent property.

Adjacent excavations should generally be tackled in order of depth with the deepest first. Vehicles and spoil heaps etc. should not surcharge excavations, and edge protection and fencing should be used as appropriate. Frozen materials should generally not be used as backfill.

9.5 Pavements

The design of pavements will depend on the performance requirements and specification, as well as the ground conditions and finished levels etc. The suitability of shallow soils encountered as a formation level for pavements is summarised as follows:

Strata	Base Depth	Suitability
Topsoil	0.60-0.80m	Not suitable for trafficable pavements. All topsoil should be removed and replaced.
Made Ground	0.30m	The materials will be frost susceptible so a minimum pavement thickness of 450mm will be required. Given the limited thicknesses present, it is anticipated the Made Ground would therefore be removed.
Storm Beach Deposits	4.00m+	These materials are generally a suitable formation level. The formation is potentially frost susceptible, and a minimum pavement thickness of 450mm should be considered. TRRL 1132 suggests a CBR of around 60%, under all construction and groundwater conditions.

The formation level should be carefully inspected, and any soft or loose zones should be removed and replaced with engineering fill, well-compacted in layers to a suitable specification. Consideration might be given to installing geotextiles. All engineering fills should be granular and non-frost susceptible (i.e. <10% fine material passing 425µm sieve).

Any hard spots in the formation level such as old foundations may induce reflective cracking in the pavement and allowance should be made for removing any slabs or other hard spots etc. that may be present.

9.6 Building Materials

All sub surface concrete should be designed and specified in accordance with BS8500-1:2015+A1:2016. The results of the Sulphate and pH analyses fell into Class DS-1 and an ACEC class AC-1 is appropriate.

Buried plastics used for potable water supplies should not require any special specification in order to resist chemical contamination. No pipework should be laid where there is evidence of hydrocarbons.

9.7 Surface Water Drainage

The full scale BRE 365 soakage tests suggested an infiltration rate in the order of $3.1x10^{-2}$m/s (10.0l/s) for the Storm Beach Deposits. These materials are therefore potentially suitable for soakaways.

Concentrated discharges of water into the Storm Beach Deposits may pose a risk of subsidence. This may be especially problematic in fissured rocks or well-graded granular soils. In accordance with the building regulations, it is recommended that soakaways are positioned a minimum of 5m away from buildings and sensitive structures.

10.0 CONTAMINATION LABORATORY TESTING

10.1 Scheduled Testing

Waste classification testing on one sample was included in the scope of works, to provide a preliminary assessment for waste handling (LS1 and LS2). In the absence of any areas to specifically target, a representative sample of Made Ground was selected for testing.

Sample	Strata	LS1	Asbestos	LS2
DS01, 0.20m	Made Ground	✓	✓	✓

The relevant screening suites are defined below. Where duplicate analysis exists between suites, each test is performed only once:

Suite	Definition
LS1 (soil)	Screening suite: pH, fraction of organic carbon, Metals and Non-Metals, water soluble Sulphate, Sulphide, total Cyanide, total Phenols, speciated PAH's.
Asbestos	Asbestos screen: Laboratory screening for fibres and Asbestos Containing Materials; identification where identified. Using polarising light and dispersion staining as described in HSG 248, HSE Contract Research Report No 83/1996and in Davies et al, 1996.
LS2	Waste Acceptance Criteria: Total Organic Carbon, Loss on Ignition, BTEX, speciated PCB's, Mineral Oil (EC10 – EC40), pH, Acid Neutralisation Capacity, speciated PAH's, 10:1 leachable Metals and Non Metals.

The results are discussed in the relevant sections.

11.0 PRELIMINARY CONTAMINATION ASSESSMENT

Contaminated land risks are evaluated on following a source-pathway-receptor ('SPR') approach, in accordance with best practice. A full geo-environmental risk assessment was outside the scope of this report. However, based on the findings of the desk study, no significant sources of potential contamination, natural or man-made, arising in soils, ground gases or groundwater phases, were suspected.

Waste classification data was screened for human health and found that Lead exceeded the screening value for residential dwellings with plant uptake, where the screening value is 200mg/kg and Lead was detected at 1300mg/kg. The screening value for Lead assumes that all ingested contaminant will be fully soluble in stomach acid and able to enter the body. However, the bioaccessible fraction of the metal can be measured using BARGE testing which may reduce the fraction of lead able to enter the body. Whilst there are costs associated with this testing, the results may prove favourable.

Certain Polycyclic Aromatic Hydrocarbons (PAHs) were also found to exceed the screening criteria for residential dwellings with plant uptake. Land Science uses the surrogate marker approach which uses benzo(a)pyrene as a representative compound for all genotoxic PAHs. This approach was used because benzo(a)pyrene was detected in the samples, and the other PAHs identified above the individual screening values were all classed as genotoxic. In this case the screening criteria for Benzo(a)pyrene as the surrogate marker was 5.0, and the results in DS01 at 0.20m were 5.1.

Use of the LQM PAH Double Ratio Tool found that the PAHs are consistent with combustion, coal tar and creosote signatures originating from an urban background and not related to fuel signatures.

At this stage recommendations are made for either further testing or remediation. Further testing would likely include BARGE testing to assess the bioaccessible fraction of Lead present and further testing of soil samples for PAHs to evaluate the extent of the contamination across the site. This approach may reduce or eliminate the need for remediation of the site. If the site is remediated with no further testing, then all Made Ground would need to be stripped out to remove the source of contamination.

Any Made Ground, shallow soils which have been disturbed, or those showing field evidence of possible contamination such as staining, should be treated as suspect, handled with appropriate care, and relevant advice sought from a qualified professional.

12.0 PRELIMINARY WASTE ASSESSMENT

12.1 General

Waste may be defined as any substance or object in Annex 1 of the Waste Framework Directive which the holder discards, intends to discard, or is required to discard. Subject to certain provisions, soils may either be handled as either:

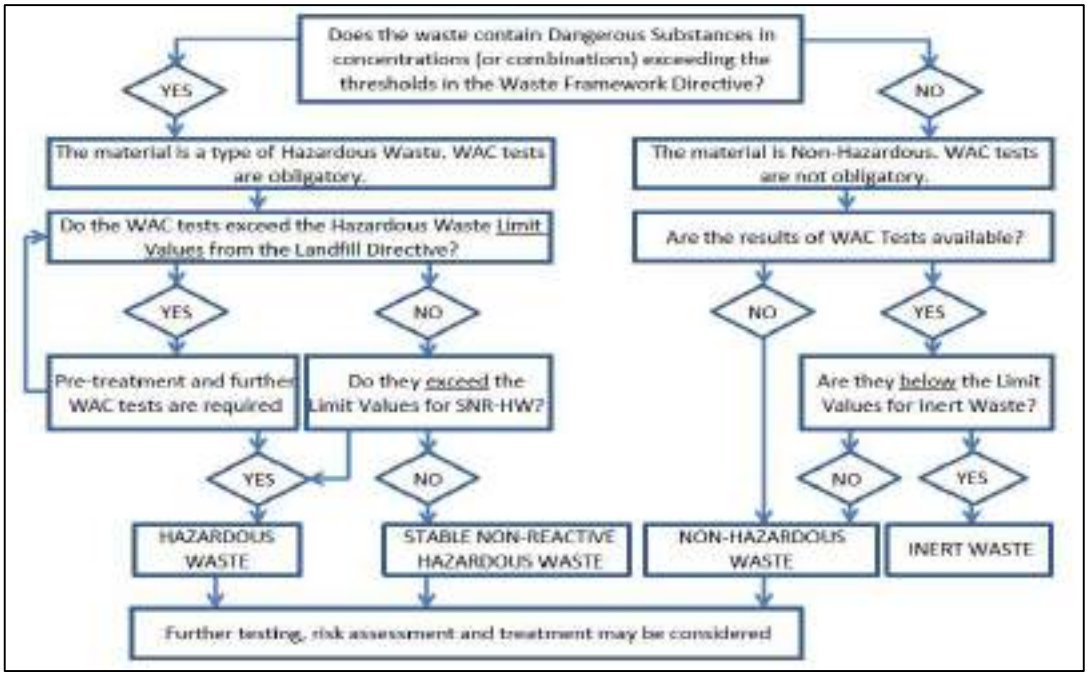
- Non-Waste, and re-used (on or off-site), or
- Waste, and disposed of (to a waste management facility).

Given the confines of the site, it was anticipated that all materials would be disposed of from site as waste.

The waste producer has a legal duty of care to ensure that waste materials are handled properly and sent to the appropriate licenced facility. Further inspection, testing, segregation etc will be required on site, and the advice of a suitably qualified consultant sought wherever necessary. Substantial tax penalties and fines are being levied by the regulators. The advice contained in this section is preliminary only.

12.2 Waste Disposal

Where materials are not re-used, they must be handled as Waste, and must be sent to a licenced waste management facility. The classification of waste is prescribed under the Waste Framework Directive and the Landfill Directive, as summarised below. Different waste management facilities may also have specific acceptance criteria, and their advice should be sought.



The results of the soil analysis have been classified as follows:

Soil	Hazardous		Non-Hazardous		Details
	Hazardous	Stable Non-Reactive	Non-Hazardous	Inert	
Made Ground - Front Drive		✓			The soil analysis was identified as Hazardous waste, although the WAC test met the criteria for Stable Non-reactive Hazardous Waste. The tests failing the criteria were HP7 (carcinogenic) and HP14 (ecotoxic).

With reference to the current List of Wastes (formerly European Waste Catalogue), waste soils and stone derived from construction and demolition sites may be disposed of under either of the following codes as appropriate:

Waste	Code	Description
Hazardous	17 05 03*	soil and stones containing dangerous substances
Non-Hazardous	17 05 04	soil and stones other than those mentioned in 17 05 03

(Note, the asterix is a Mirror Entry, as defined in the List of Wastes, conferring the relationship with the non-hazardous code 17-05-04).

REFERENCES

A number of technical references have been referred to in the preparation of this document, including:

- Smith, I. (2014) Smith's Elements of Soil Mechanics. Chichester. Wiley Blackwell. 9th Edition.
- Highways England 2009. Interim Advice Note 73/06 revision 1: Design Guidance for Road Pavement foundations (draft HD25)
- BRE Design Guide 365. Soakaway design ("DG365")
- Radon: Guidance on protective measures for new buildings, BRE Report BR 211, 2015 2ND edition
- Groundwater protection: Principles and practice (GP3) August 2013 Version 1.1
- Revised EU Waste Framework Directive 2008 2008/98/EC [transposed into English law under The Waste (England and Wales) Regulations 2011]
- European Community (EC) Directive 1999/31/EC [transposed into English law under the Landfill (England and Wales) Regulations 2002]
- Defining Waste Recovery - Permanent Deposit of Waste on Land, EPR13 v1.0, EA 2010
- The definition of waste: Development Industry Code of Practice, v2, CL:AIRE 2011
- Guidance on the classification and assessment of waste Technical Guidance WM3 ("WM3") EA publication (1st edition 2015)

REPORT CONDITIONS

The Client

This report may also be used only by the client named in section 1 and their appointed project team for the purpose of design, obtaining planning, building regulations approval, and in connection with finance. This report must not be used by any other persons or for other purposes without express written agreement of Land Science.

General

Land Science takes all reasonable professional care in preparation of this report, using current standards and industry practice. However, the evaluation of ground conditions depends on an interpretation and extrapolation of the conditions revealed by a limited data set. The level of risk is related to the extent of investigation and no site is ever free of risk. The client should understand their risks and liabilities. We accept no liability whatsoever in respect of:

- The scope, extent or design of an investigation.
- Any conditions not directly revealed by the investigation.
- Published standards or methodologies used or adopted in this report.
- The opinion of any other party including any regulator, authority or stakeholder.
- Any dispute, claim or consequential loss arising from any findings of this report.
- Third party information and data.

This report relates solely to ground-related matters as set out in the objectives and makes no representation on other matters such as ecology, arboriculture, invasive plant species, the condition of buildings and structures, hazardous building materials such as insulation or asbestos, the locations of boundaries, unexploded ordnance, and or planning constraints etc. Further reports should be commissioned in this respect as appropriate.

Regulators and Approvals

This (and any other) report should be submitted to relevant authorities for their own assessments and to provide their approval or comments accordingly. This should be in good time before commencing on site in case additional work is to be carried out.

Standards, technical guidance and regulatory positions change over time and which may therefore affect the findings and recommendations made in this report; this should be verified by the client prior to any critical project milestones. Where this information is used in design, the designer should verify that the information is appropriate and has been used correctly.

Variations with time

The report relates to conditions revealed at the time of the investigation and any monitoring visits. Some parameters may vary over time or seasonally; groundwater levels, ground gas compositions, or concentrations of contaminants are particularly variable in this respect. Further monitoring or verification should be considered as appropriate.

GLOSSARY OF TERMS

ACM	Asbestos Containing Material
BGS	British Geological Survey
BRE	Building Research Establishment
BS	British Standard
C4SL	Category 4 Screening Level
CBR	California Bearing Ratio
CDM	Construction Design and Management regulations
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CLEA	Contaminated Land Exposure Assessment model
CSM	Conceptual Site Model
EA	Environment Agency
EQS	Environmental Quality Standards
FOC	Fraction of Organic Carbon
GAC	Generic Assessment Criterion
GQRA	Generic Quantitative Risk Assessment
mbgl	Meters Below Ground Level
NHBC	National House Building Council
mOD	Metres above Ordnance Datum
PAH's	Polycyclic Aromatic Hydrocarbons
PHE	Public Health England
PID	Photo-Ionisation Detector
PQRA	Preliminary Quantitative Risk Assessment
PSD	Particle Size Distribution Test
RMS	Remediation Method Statement
S4UL	Suitable for Use Level
SOM	Soil Organic Matter
SPZ	Source Protection Zone
SPT	Standard Penetration Test
SSSI	Sites of Special Scientific Interest
ST-WEL	Short Term Workplace Exposure Limit
SVOC's	Semi-Volatile Organic Compounds
TPH	Total Petroleum Hydrocarbons
TRRL / TRL	Transport Road Research Laboratory
TWA-WEL	Time Weighted Average Workplace Exposure Limit
UK HBF	United Kingdom House Building Federation
VOC's	Volatile Organic Compounds
WAC	Waste Acceptance Criteria

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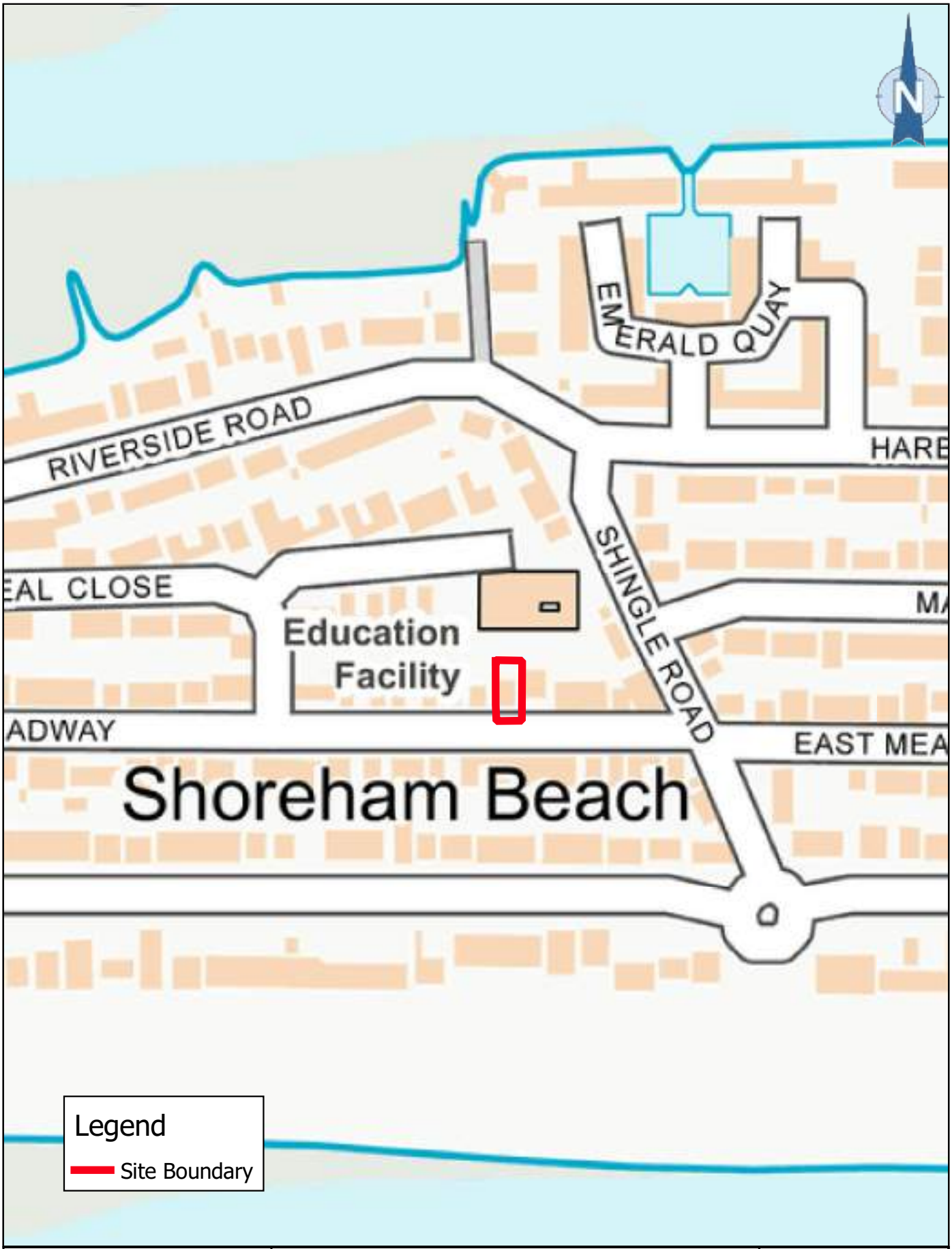

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Land Science	Title: Site Location			Reference: LS6595
	Project: 56 The Meadway, Shoreham-By- Sea, BN43 5RP			Figure: 1
	Client: Mr and Mrs Gunzi			Date: 03/11/2022
	Prepared by: JT	Checked by: ET	Version: 01	Sheet: 1

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Land Science	Title: Investigation Layout		Reference: LS6595
	Project: 56 The Meadway, Shoreham-By-Sea, BN43 5RP		Figure: 2
	Client: Mr and Mrs Gunzi		Date: 01/12/2022
	Prepared by: EP	Checked by: ET	Version: 01	Sheet: 1 of 1

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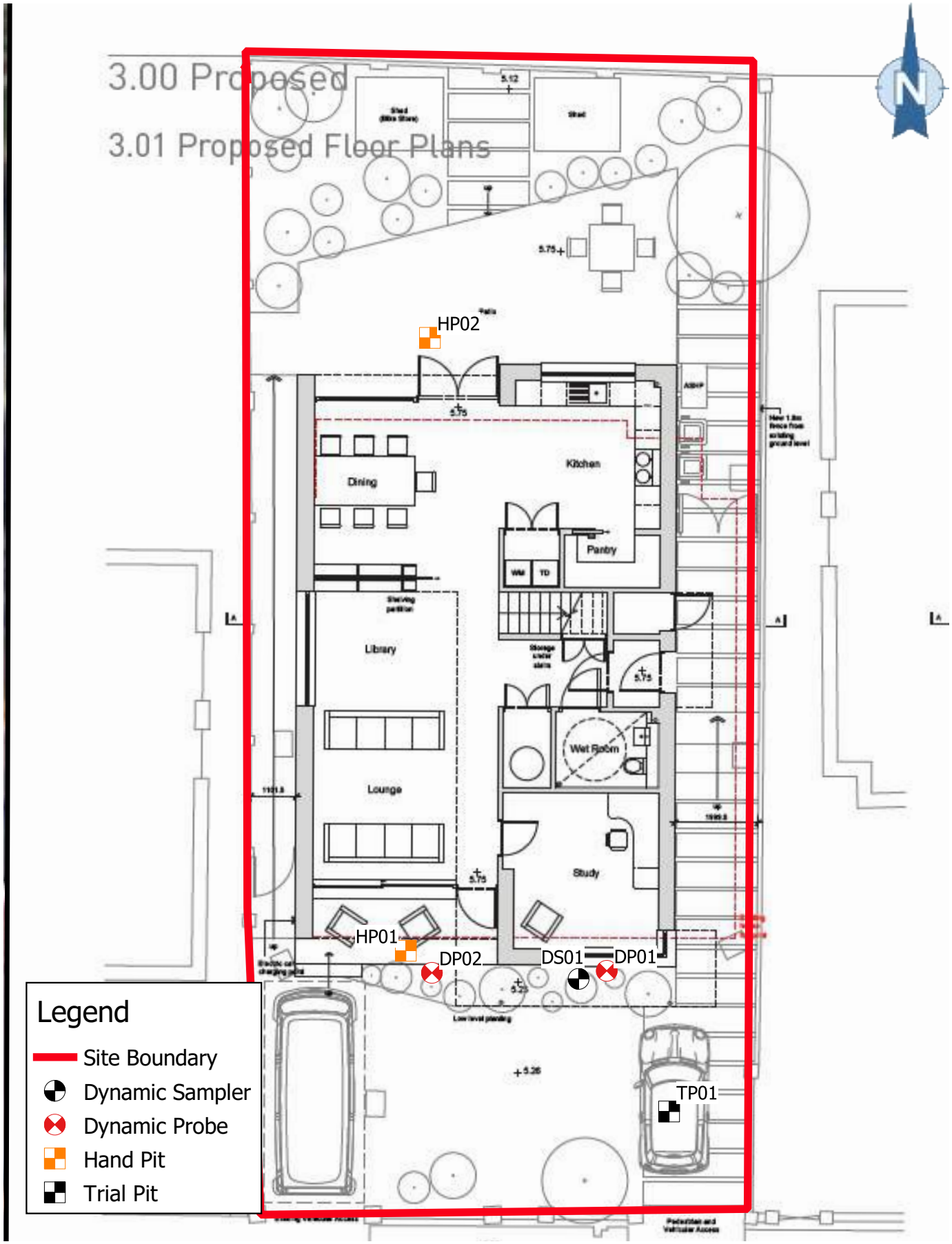

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Land Science	Title: Proposed Site Layout		Reference: LS6595
	Project: 56 The Meadway, Shoreham-By-Sea, BN43 5RP		Figure: 3
	Client: Mr and Mrs Gunzi		Date: 01/12/2022
	Prepared by: EP	Checked by: ET	Version: 01	Sheet: 1 of 1

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APPENDIX A

SITE WALKOVER RECORD

The walkover is restricted only to aspects related to the Land Science report and the stated objectives therein. The walkover does not replace other surveys such as asbestos, arboriculture, ecology, utilities etc which the client should consider. The client should review the walkover and provide any further relevant information where available.

SITE DETAILS			
Project	*56 The Meadway, Shoreham by Sea, BN43 5RP*		
Reference	*LS6595*	**Date of walkover**	*24/11/2022*
Engineer	*Jake Trangmar*		
CURRENT USE			
Existing land uses	*The site comprised a single residential dwelling with associated private garden and driveway area to the front of the property. Two small sheds were noted in the rear garden.*		
Status	*Occupied.*		
Suspected asbestos	*No immediate evidence.*		
Below ground structures	*No immediate evidence.*		
Hardstandings	*The driveway was covered with concrete hardstanding, as well as the building footprint and likely the bases noted to the sheds in the rear garden also. A paved patio area was noted in the rear garden and this ran along the side access of the dwelling and met with the front driveway.*		
Soft landscaping	*The rear garden was laid to lawn with borders made up of small shrubs and trees.*		
General condition	*Old but well-kept.*		
Boundaries	*The boundaries to the rear garden were made up of a combination of timber fencing and brick walls.*		
Adjacent land uses	*The site was surrounded by other residential land uses.*		
TOPOGRAPHY			
General lie of the land	*Located on a low-lying coastal area.*		
General lie of the site	*Sensibly flat and level.*		
Abrupt changes in slope	*None recorded.*		

Excavations and Depressions	*None recorded.*
Raised ground	*None recorded.*
GROUND STABILITY	
Signs of landslip	*N/A*
Cracking in buildings and walls etc	*N/A*
Subsidence on ground surface	*N/A*
GROUND CONDITIONS	
Possible filled-in ground	*N/A*
Possible built-up ground	*N/A*
Exposed soils	*N/A*
Desiccation	*N/A*
Disturbance	*N/A*
WATER CONDITIONS	
Wet boggy ground	*N/A*
Wells and ditches	*N/A*
Ponds or ponding	*N/A*
Streams / Rivers	*N/A*
ECOLOGY	
Burrows	*N/A*
VEGETATION	
Reeds or water loving plants	*N/A*
Sparse growth or die back	*N/A*
Invasive species	*N/A*
TREES	
Relevant trees height/species	*Various species of small tress were noted in the rear garden, these ranged in height between 2.00-3.00m in height. Two further shrubs were*

	noted in the driveway of the property and were noted to be approximately 1.00-3.00m in height.
Off-site	*Further small shrubs and trees were noted in the gardens of the neighbouring residential dwellings.*
Hedgerows	*N/A*
Recent felling and older stumps	*N/A*
CONTAMINATION	
Tipped materials	*N/A*
Areas of possible fill	*N/A*
Discolouration/sheens of waterbodies	*N/A*
Surface staining	*N/A*
Chemicals storage	*N/A*
Drums and tanks	*N/A*
Petrol interceptor	*N/A*
Soakaways	*N/A*
LOCAL INFORMATION	
Place/road names	
3rd party information	
OTHER INFORMATION	

APPENDIX B











Land Science	**TITLE:**	Site Photographs	**REF:** LS6595	**PREPARED:**	EP
	PROJECT:	56 The Meadway, Shoreham-by-Sea, BN43 5RP	**FIGURE:** N/A	**CHECKED:**	ET
	CLIENT:	Mr and Mrs Gunzi	**DATE:** 25/11/2022	**VERSION:**	V1

APPENDIX C

Land Science	Brighton | London | Bristol 0845 604 6494 www.landscience.co.uk	Site 56 The Meadway, Shoreham-By-Sea, BN43 5RP	Number DS01

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Drive-in Windowless Sampler			Mr and Mrs Gunzi	LS6595
	Location	**Dates** 15/11/2022	**Project Contractor** Land Science	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.30)	Dark brown black sandy, gravelly, clayey, SILT. Sands are fine to medium. Gravels are fine, subangular to subrounded flint with rare carpet fragments. Abundant rootlets noted throughout. (MADE GROUND)			
0.20	D				0.30				
						Brown, sandy, silty, GRAVEL. Sands are fine to medium. Gravels are fine to medium, subangular to subrounded flint. (STORM BEACH DEPOSITS)			
0.50	D				(0.70)				
					1.00	Slightly orange brown, sandy, GRAVEL. Sands are fine to coarse. Gravels are fine to medium, subangular to subrounded flint. (STORM BEACH DEPOSITS)			
1.50	D				(1.50)				
2.20	D				2.50	Pale yellow, orange brown, gravelly, SAND. Sands are fine to medium. Gravels are fine to medium, subangular to subrounded flint. (STORM BEACH DEPOSITS)			
2.80	D								
3.20	D				(1.50)				
3.80	D				4.00				

Remarks
GROUNDWATER: No groundwater encountered.
CASING: Casing to 3.00m, open hole to 4.00m.
INSTALLATION: 50mm diameter HDPE standpipe to 4.00m; plain casing to 1.00m, slotted response zone 1.00m to 4.00m.
BACKFILL: Bentonite sealing pellets 0.00-1.00m. 10mm washed pea gravel filter pack 1.00-4.00m.
SLOW PROGRESS: Slow progress throughout gravels.
NOTES: Hand excavated inspection pit to 1.20mbgl. Borehole terminated at 4.00m due to collapse in sands and gravels.

Scale (approx)	Logged By
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Figure No.
LS6595.DS01

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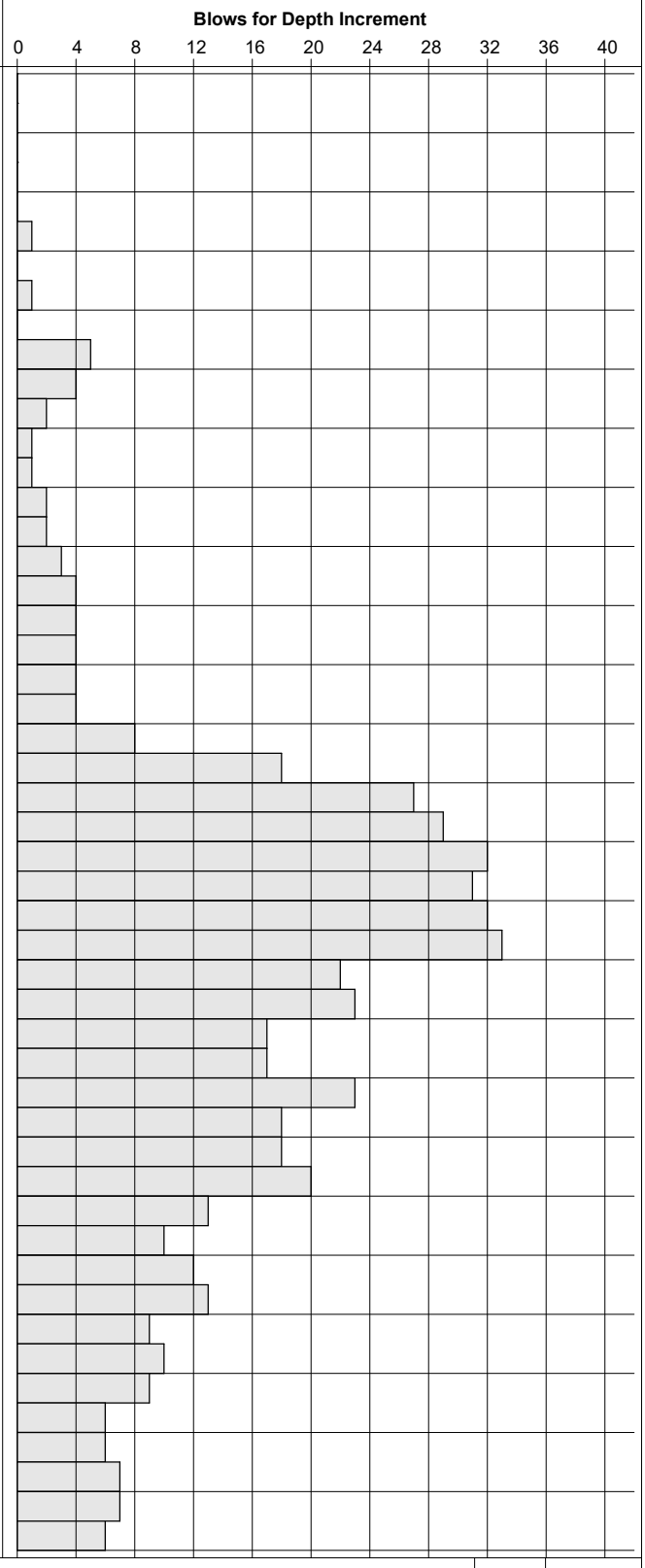
Land Science	Brighton | London | Bristol 0845 604 6494 www.landscience.co.uk	Site 56 The Meadway, Shoreham-By-Sea, BN43 5RP	Probe Number DP01

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probing			Mr and Mrs Gunzi	LS6595
	Location	**Dates**	**Engineer**	**Sheet**
		15/11/2022	Land Science	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	0		
0.10-0.20	0		
0.20-0.30	0		
0.30-0.40	0		
0.40-0.50	0		
0.50-0.60	1		
0.60-0.70	0		
0.70-0.80	1		
0.80-0.90	0		
0.90-1.00	5		
1.00-1.10	4		
1.10-1.20	2		
1.20-1.30	1		
1.30-1.40	1		
1.40-1.50	2		
1.50-1.60	2		
1.60-1.70	3		
1.70-1.80	4		
1.80-1.90	4		
1.90-2.00	4		
2.00-2.10	4		
2.10-2.20	4		
2.20-2.30	8		
2.30-2.40	18		
2.40-2.50	27		
2.50-2.60	29		
2.60-2.70	32		
2.70-2.80	31		
2.80-2.90	32		
2.90-3.00	33		
3.00-3.10	22		
3.10-3.20	23		
3.20-3.30	17		
3.30-3.40	17		
3.40-3.50	23		
3.50-3.60	18		
3.60-3.70	18		
3.70-3.80	20		
3.80-3.90	13		
3.90-4.00	10		
4.00-4.10	12		
4.10-4.20	13		
4.20-4.30	9		
4.30-4.40	10		
4.40-4.50	9		
4.50-4.60	6		
4.60-4.70	6		
4.70-4.80	7		
4.80-4.90	7		
4.90-5.00	6		



Remarks

Scale (approx)	Logged By
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Figure No.
LS6595.DP01

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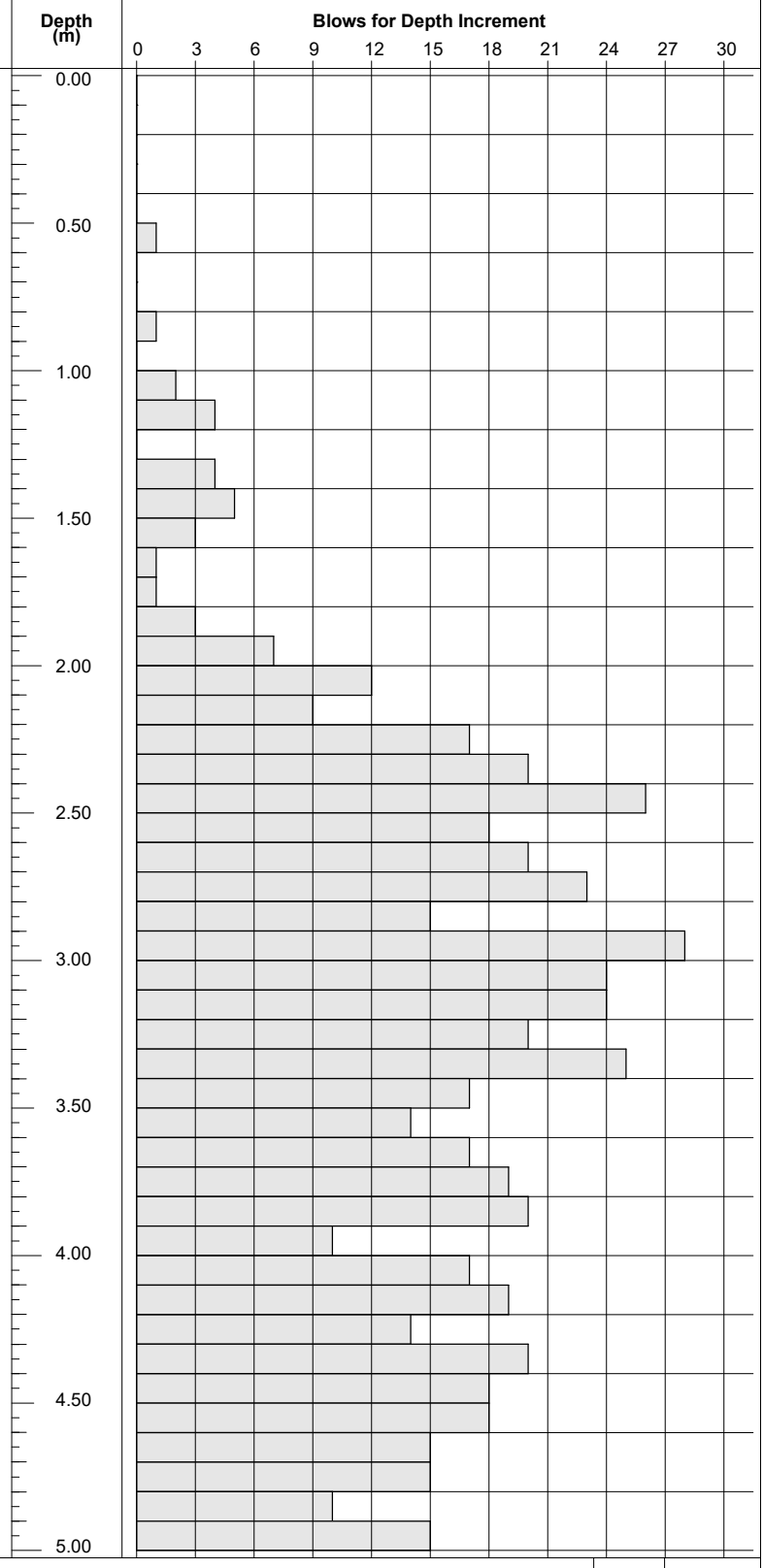
Site	Probe Number
56 The Meadway, Shoreham-By-Sea, BN43 5RP	DP02

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probing			Mr and Mrs Gunzi	LS6595
	Location	**Dates**	**Engineer**	**Sheet**
		15/11/2022	Land Science	1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)
0.00-0.10	0		
0.10-0.20	0		
0.20-0.30	0		
0.30-0.40	0		
0.40-0.50	0		
0.50-0.60	1		
0.60-0.70	0		
0.70-0.80	0		
0.80-0.90	1		
0.90-1.00	0		
1.00-1.10	2		
1.10-1.20	4		
1.20-1.30	0		
1.30-1.40	4		
1.40-1.50	5		
1.50-1.60	3		
1.60-1.70	1		
1.70-1.80	1		
1.80-1.90	3		
1.90-2.00	7		
2.00-2.10	12		
2.10-2.20	9		
2.20-2.30	17		
2.30-2.40	20		
2.40-2.50	26		
2.50-2.60	18		
2.60-2.70	20		
2.70-2.80	23		
2.80-2.90	15		
2.90-3.00	28		
3.00-3.10	24		
3.10-3.20	24		
3.20-3.30	20		
3.30-3.40	25		
3.40-3.50	17		
3.50-3.60	14		
3.60-3.70	17		
3.70-3.80	19		
3.80-3.90	20		
3.90-4.00	10		
4.00-4.10	17		
4.10-4.20	19		
4.20-4.30	14		
4.30-4.40	20		
4.40-4.50	18		
4.50-4.60	18		
4.60-4.70	15		
4.70-4.80	15		
4.80-4.90	10		
4.90-5.00	15		



Remarks

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Figure No. LS6595.DP02

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Land Science	Brighton | London | Bristol 0845 604 6494 www.landscience.co.uk	**Site** 56 The Meadway, Shoreham-By-Sea, BN43 5RP	**Trial Pit Number** **HP01**

Machine : Hand Excavated **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)**	**Client** Mr and Mrs Gunzi	**Job Number** LS6595
	Location	**Dates** 15/11/2022	**Project Contractor** Land Science	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.05) 0.05	Grass over black sandy, SILT. Rare slate noted throughout. Sands are fine to medium. Abundant rootlets noted. (TOPSOIL)		
0.20	D				(0.45)	Orangey brown mottled black GRAVEL. Gravels are fine to medium subangular to subrounded flint. Occasional rootlets noted. (STORM BEACH DEPOSITS)		
0.50	D				0.50	Terminated at 0.50m		

Plan

Remarks

GROUNDWATER: No groundwater encountered.
STABILITY: Trial hole becoming unstable from 0.30m.
BACKFILL: Trial hole backfilled with arisings.
DIMENSIONS: 0.40m (l) 0.40m (w) (approx).
NOTES: Trial hole terminated at 0.50m due to undermining.

Scale (approx)	**Logged By**	**Figure No.**
1:10	JT	LS6595.HP01

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Site	Trial Pit Number
56 The Meadway, Shoreham-By-Sea, BN43 5RP	HP02

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Mr and Mrs Gunzi	LS6595
	Location	**Dates** 15/11/2022	**Project Contractor** Land Science	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Decorative flora over slightly sandy, slightly gravelly, SILT. Sands are fine to medium. Gravels are fine to coarse subangular to subrounded flint. Rootlets noted throughout. (TOPSOIL)		
0.20	D				0.30			
					(0.20)	Light brown orangey GRAVEL. Gravels are fine to coarse, subangular to subrounded flint. (STORM BEACH DEPOSITS)		
0.40	D				0.50			
						Terminated at 0.50m		

Plan

Remarks

GROUNDWATER: No groundwater encountered.
STABILITY: Trial hole becoming unstable from 0.30m.
BACKFILL: Trial hole backfilled with arisings.
DIMENSIONS: 0.50m (l) 0.40m (w) (approx).
NOTES: Trial hole terminated at 0.50m due to undermining.

Scale (approx)	Logged By	Figure No.
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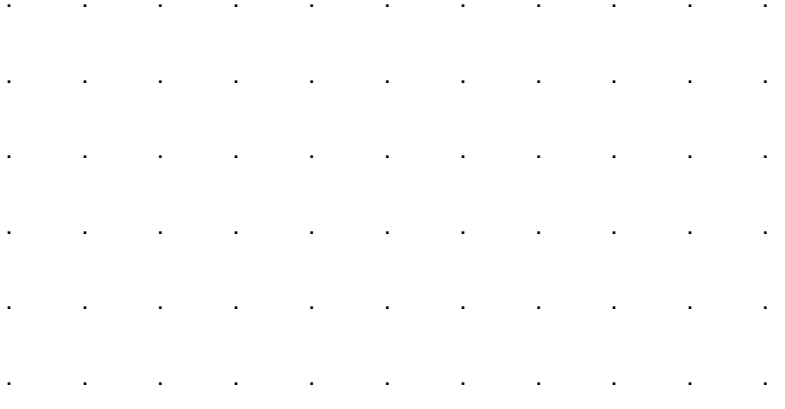
Site	Trial Pit Number
56 The Meadway, Shoreham-By-Sea, BN43 5RP	TP01

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit			Mr and Mrs Gunzi	LS6595
	Location	**Dates** 15/11/2022	**Project Contractor** Land Science	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.05) 0.05	Concrete paving slab. (HARDSTANDING)		
					(0.25) 0.30	Light grey brown, sandy GRAVEL. Sands are fine to coarse. Gravels are fine to coarse, angular to subrounded brick, concrete and mortar. Abundant fine rootlets noted. (MADE GROUND)		
0.40	D				(0.30) 0.60	Light orangey brown GRAVEL. Gravels are medium to coarse, subangular to rounded flint. (STORM BEACH DEPOSITS)		
0.60	D					Terminated at 0.60m		

Plan



Remarks

GROUNDWATER: No groundwater encountered.
STABILITY: Trial hole becoming unstable from 0.30m.
BACKFILL: Trial hole backfilled with arisings.
DIMENSIONS: 0.80m (l) 0.40m (w) (approx).
NOTES: Trial hole terminated at 0.60m due to collapse.

Scale (approx)	Logged By	Figure No.
1:10	CS	LS6595.TP01

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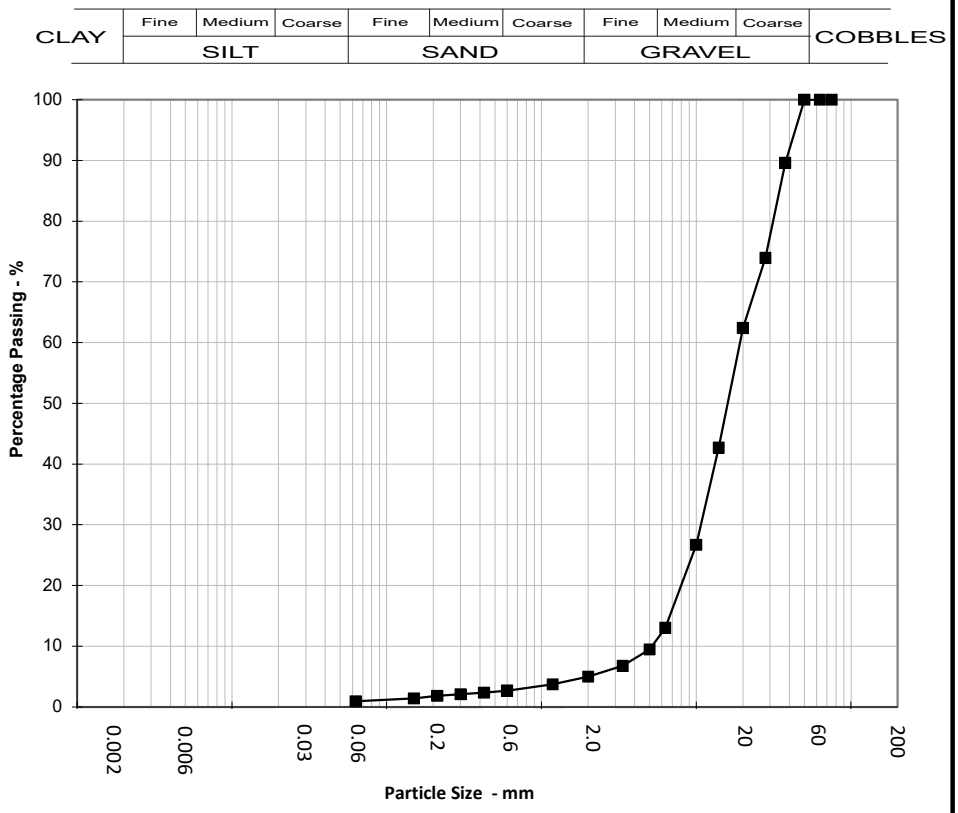
APPENDIX D

SUMMARY OF PARTICLE SIZE DISTRIBUTION ANALYSIS			
Site Name:	56 The Meadway	**Samples Received:**	16/11/2022
Reference:	LS6595	**Reported:**	17/11/2022

Sample Data		**Sample Description**
Position	DS01	Orange brown and grey GRAVEL
Sample Ref	-	
Depth	1.50	

Sieve Analysis	
mm	**%**
125	
90	
75	100.0
63	100.0
50	100.0
37.5	89.6
28	74.0
20	62.4
14	42.7
10	26.7
6.3	13.0
5.0	9.5
3.35	6.8
2.0	5.0
1.18	3.7
0.60	2.7
0.425	2.3
0.30	2.1
0.212	1.8
0.150	1.4
0.063	0.9
0.020	
0.006	
0.002	



Sample Proportions		**Grading Analysis**	
Cobbles	0.0	D100	50
Gravel	95.0	D60	19
Sand	4.1	D10	5.2
Silt & Clay	0.9	Uniformity Coeff.	3.7
-		-	

BS 1377 : Part 2 : 1990 : Clause 9

Test Results relate only to the sample numbers shown above.

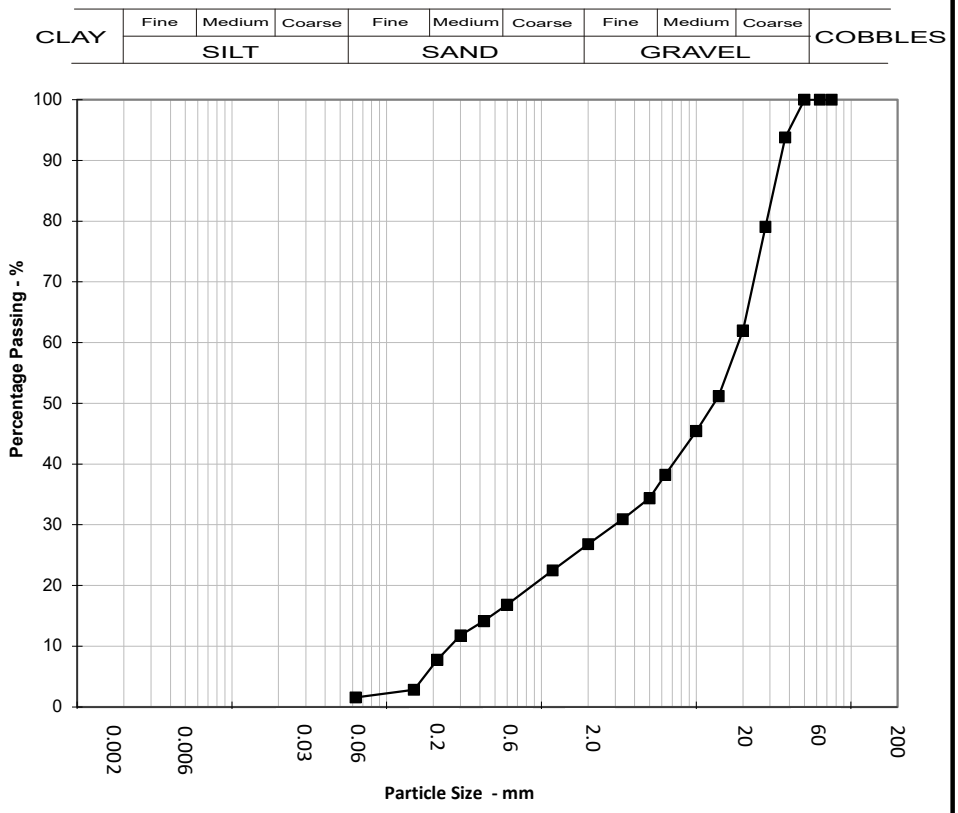
Prepared:
T Curtis
Checked:
E Toms

THE OLD POLICE STATION, JOBS LANE, SAYERS COMMON, WEST SUSSEX, BN6 9HE
t: 0845 604 6494 **e:** brighton@landscience.co.uk

Land Science	**SUMMARY OF PARTICLE SIZE DISTRIBUTION ANALYSIS**			
	Site Name:	56 The Meadway	**Samples Received:**	16/11/2022
	Reference:	LS6595	**Reported:**	17/11/2022

Sample Data		**Sample Description**
Position	DS01	Yellowy brown very sandy GRAVEL
Sample Ref	-	
Depth	2.80	

Sieve Analysis	
mm	**%**
125	
90	
75	100.0
63	100.0
50	100.0
37.5	93.8
28	79.1
20	62.0
14	51.2
10	45.4
6.3	38.2
5.0	34.4
3.35	30.9
2.0	26.8
1.18	22.5
0.60	16.8
0.425	14.1
0.30	11.8
0.212	7.7
0.150	2.8
0.063	1.6
0.020	
0.006	
0.002	



Sample Proportions		**Grading Analysis**	
Cobbles	0.0	D100	50
Gravel	73.2	D60	19
Sand	25.2	D10	0.26
Silt & Clay	1.6	Uniformity Coeff.	73.1
-		-	

BS 1377 : Part 2 : 1990 : Clause 9

Test Results relate only to the sample numbers shown above.

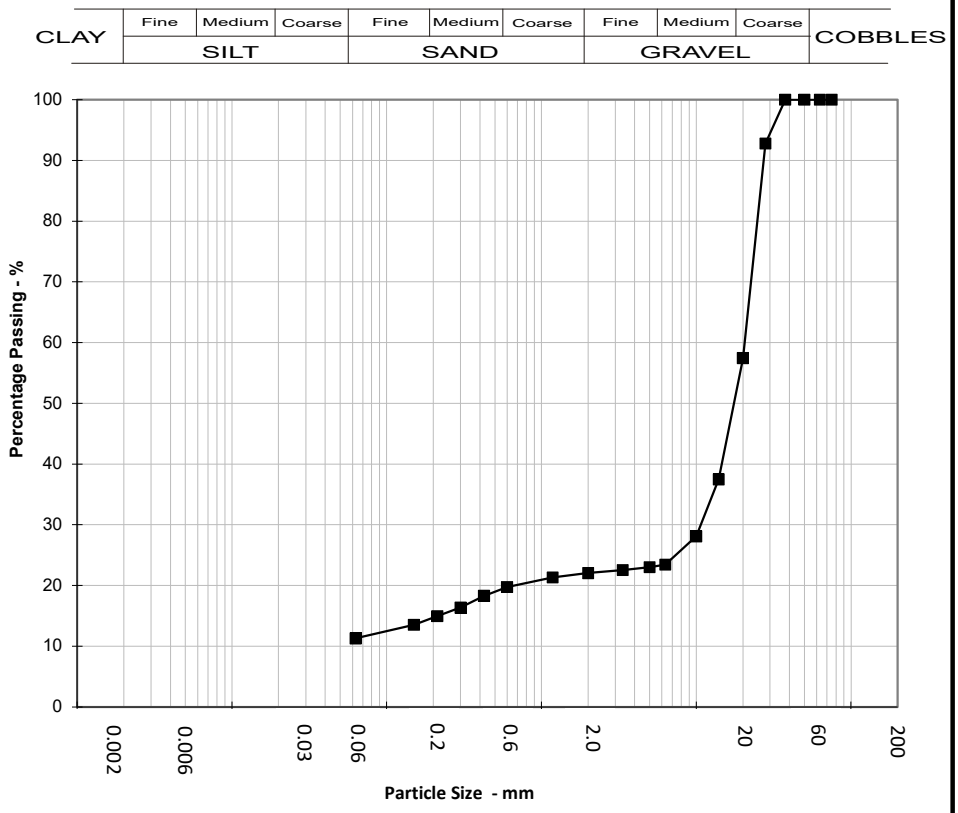
Prepared:
T Curtis
Checked:
E Toms

THE OLD POLICE STATION, JOBS LANE, SAYERS COMMON, WEST SUSSEX, BN6 9HE
t: 0845 604 6494 **e:** brighton@landscience.co.uk

Land Science	**SUMMARY OF PARTICLE SIZE DISTRIBUTION ANALYSIS**			
	Site Name:	56 The Meadway	**Samples Received:**	16/11/2022
	Reference:	LS6595	**Reported:**	17/11/2022

Sample Data		**Sample Description**
Position	HP02	Dark brown silty sandy GRAVEL
Sample Ref	-	
Depth	0.40	

Sieve Analysis	
mm	**%**
125	
90	
75	100.0
63	100.0
50	100.0
37.5	100.0
28	92.8
20	57.5
14	37.5
10	28.1
6.3	23.4
5.0	23.0
3.35	22.5
2.0	22.0
1.18	21.3
0.60	19.7
0.425	18.3
0.30	16.3
0.212	15.0
0.150	13.5
0.063	11.3
0.020	
0.006	
0.002	



Sample Proportions		**Grading Analysis**	
Cobbles	0.0	D100	37.5
Gravel	78.0	D60	21
Sand	10.7	D10	-
Silt & Clay	11.3	Uniformity Coeff.	#VALUE!
-		-	

BS 1377 : Part 2 : 1990 : Clause 9

Test Results relate only to the sample numbers shown above.

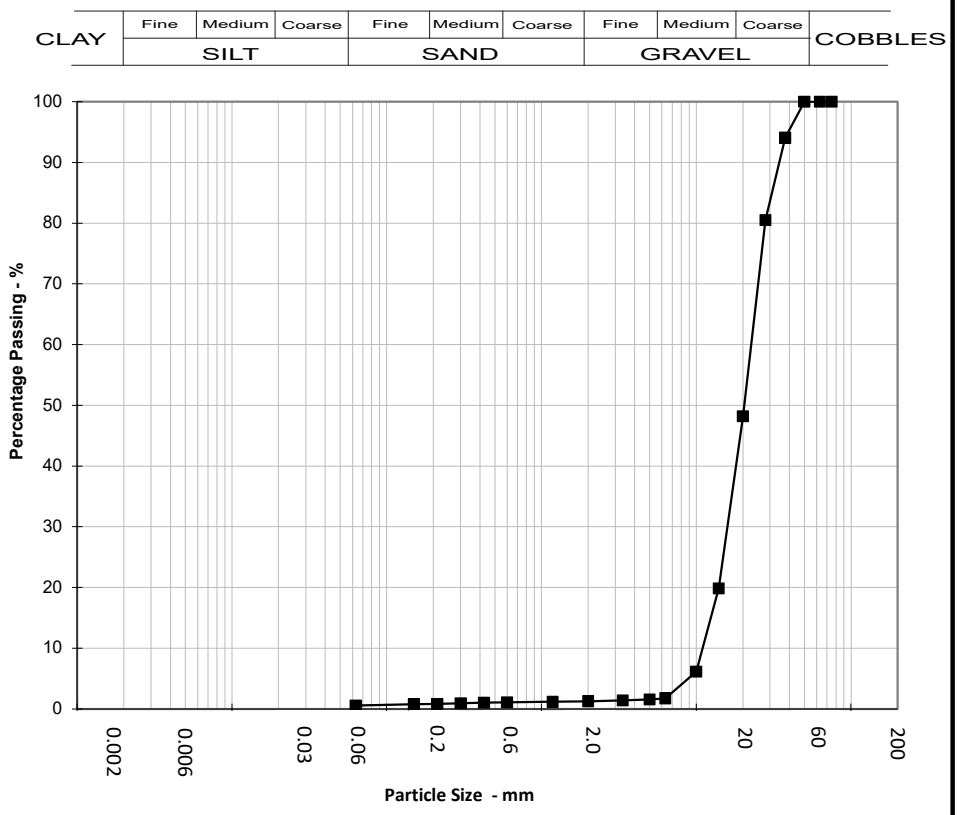
Prepared:
T Curtis
Checked:
E Toms

THE OLD POLICE STATION, JOBS LANE, SAYERS COMMON, WEST SUSSEX, BN6 9HE
t: 0845 604 6494 **e:** brighton@landscience.co.uk

Land Science	**SUMMARY OF PARTICLE SIZE DISTRIBUTION ANALYSIS**			
	Site Name:	56 The Meadway	**Samples Received:**	16/11/2022
	Reference:	LS6595	**Reported:**	17/11/2022

Sample Data		**Sample Description**
Position	TP01	Orange brown and grey GRAVEL
Sample Ref	-	
Depth	0.60	

Sieve Analysis	
mm	**%**
125	
90	
75	100.0
63	100.0
50	100.0
37.5	94.1
28	80.5
20	48.2
14	19.9
10	6.1
6.3	1.7
5.0	1.6
3.35	1.4
2.0	1.3
1.18	1.2
0.60	1.1
0.425	1.0
0.30	0.9
0.212	0.8
0.150	0.7
0.063	0.6
0.020	
0.006	
0.002	



Sample Proportions		**Grading Analysis**	
Cobbles	0.0	D100	50
Gravel	98.7	D60	23
Sand	0.7	D10	12
Silt & Clay	0.6	Uniformity Coeff.	1.9
-		-	

BS 1377 : Part 2 : 1990 : Clause 9

Test Results relate only to the sample numbers shown above.

Prepared:
T Curtis
Checked:
E Toms

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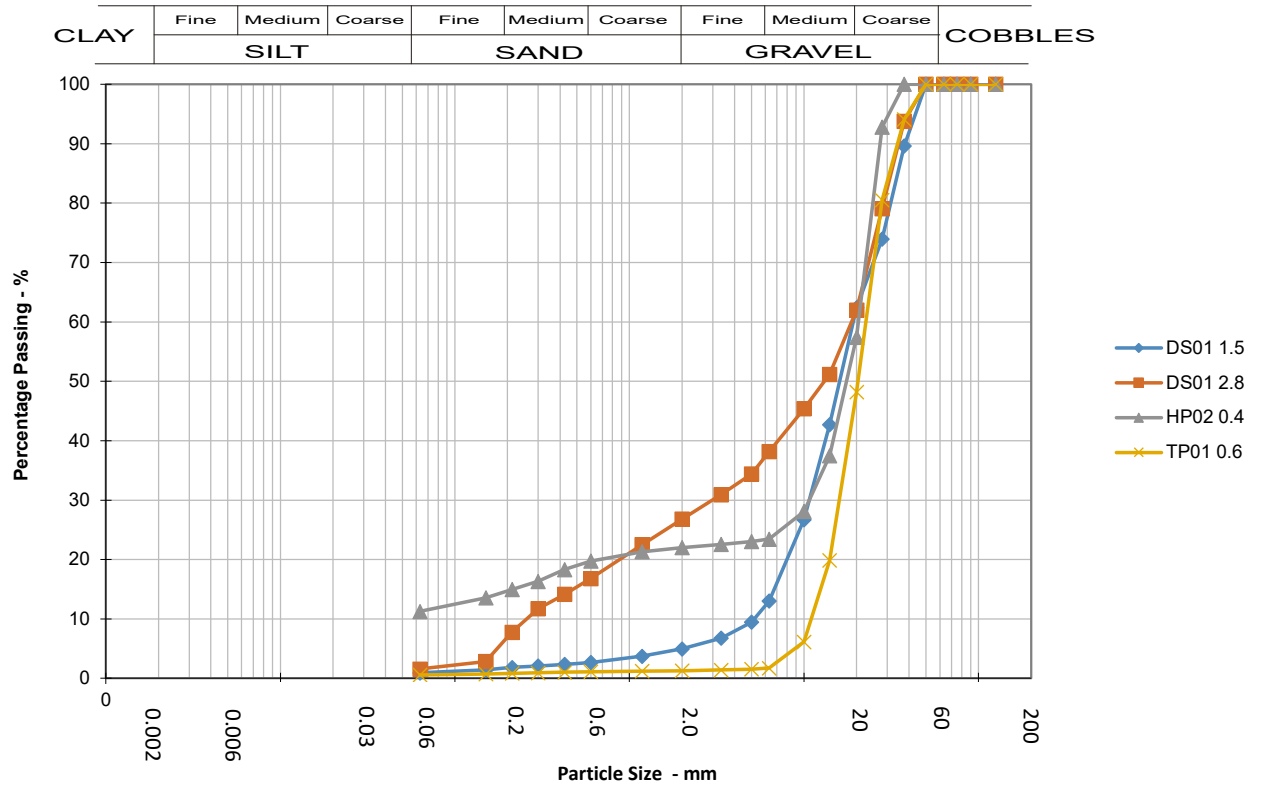
COMPOSITE PSD GRAPH

Site Name:	56 The Meadway			**Date:**	17/11/2022				
Reference:	LS6595			**Client:**					
Position	**DS01**	**DS01**	**HP02**	**TP01**					
Depth	**1.50**	**2.80**	**0.40**	**0.60**					
mm	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
125	100	100	100	100					
90	100	100	100	100					
75	100	100	100	100					
63	100	100	100	100					
50	100	100	100	100					
37.5	90	94	100	94					
28	74	79	93	81					
20	62	62	57	48					
14	43	51	37	20					
10	27	45	28	6					
6.3	13	38	23	2					
5.0	9	34	23	2					
3.35	7	31	23	1					
2.0	5	27	22	1					
1.18	4	22	21	1					
0.60	3	17	20	1					
0.425	2	14	18	1					
0.30	2	12	16	1					
0.212	2	8	15	1					
0.150	1	3	14	1					
0.063	1	2	11	1					
0.020									
0.006									
0.002									



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APPENDIX E

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Analytical Report Number : 22-97005

Replaces Analytical Report Number: 22-97005, issue no. 1
Client references/information amended.

Project / Site name:	56 The Meadway, Shoreham-By-Sea, BN43 5RP	**Samples received on:**	16/11/2022
Your job number:	LS6595	**Samples instructed on/ Analysis started on:**	16/11/2022
Your order number:		**Analysis completed by:**	08/12/2022
Report Issue Number:	2	**Report issued on:**	08/12/2022
Samples Analysed:	1 leachate sample - 3 soil samples		

Signed:

Dominika Warjan
Junior Reporting Specialist
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

This certificate should not be reproduced, except in full, without the express permission of the laboratory.

Analytical Report Number: 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

Lab Sample Number				2501284	2501285	2501286
Sample Reference				DS01	DS01	HP01
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20	2.20	0.50
Date Sampled				15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Stone Content	%	0.1	NONE	< 0.1	76	77
Moisture Content	%	0.01	NONE	22	2.3	2.9
Total mass of sample received	kg	0.001	NONE	0.8	1.2	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-
Asbestos Analyst ID	N/A	N/A	N/A	PDO	N/A	N/A

General Inorganics

pH - Manual	pH Units	N/A	MCERTS	8.2	-	-
pH - Automated	pH Units	N/A	MCERTS	8.5	8.7	8.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	-	-
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	-	14	53
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.047	0.0072	0.027
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	7.2	26.5
Sulphide	mg/kg	1	NONE	2.4	-	-
Fraction Organic Carbon (FOC) Automated	N/A	0.001	MCERTS	0.04	-	-
Total Organic Carbon (TOC) - Automated	%	0.1	MCERTS	4	-	-
Loss on Ignition @ 450oC	%	0.2	MCERTS	8.6	-	-
Acid Neutralisation Capacity	+/- mmol/kg	-999	NONE	4.8	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-

Speciated PAHs

Naphthalene	mg/kg	0.05	NONE	0.33	-	-
Acenaphthylene	mg/kg	0.05	NONE	0.22	-	-
Acenaphthene	mg/kg	0.05	NONE	0.23	-	-
Fluorene	mg/kg	0.05	NONE	0.23	-	-
Phenanthrene	mg/kg	0.05	NONE	3.3	-	-
Anthracene	mg/kg	0.05	NONE	0.45	-	-
Fluoranthene	mg/kg	0.05	NONE	7.1	-	-
Pyrene	mg/kg	0.05	NONE	6.2	-	-
Benzo(a)anthracene	mg/kg	0.05	NONE	3.7	-	-
Chrysene	mg/kg	0.05	NONE	4.9	-	-
Benzo(b)fluoranthene	mg/kg	0.05	NONE	6.2	-	-
Benzo(k)fluoranthene	mg/kg	0.05	NONE	2.7	-	-
Benzo(a)pyrene	mg/kg	0.05	NONE	5.1	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	NONE	2.8	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	NONE	0.72	-	-
Benzo(ghi)perylene	mg/kg	0.05	NONE	2.9	-	-
Coronene	mg/kg	0.05	NONE	< 0.05	-	-

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	47.1	-	-

Analytical Report Number: 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

Lab Sample Number				2501284	2501285	2501286
Sample Reference				DS01	DS01	HP01
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				0.20	2.20	0.50
Date Sampled				15/11/2022	15/11/2022	15/11/2022
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**			
Heavy Metals / Metalloids						
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-
Barium (aqua regia extractable)	mg/kg	1	MCERTS	370	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.89	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1	-	-
Chromium (hexavalent)	mg/kg	1.2	NONE	< 1.2	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	130	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	1300	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	31	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	560	-	-
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	NONE	< 1.0	-	-
Toluene	µg/kg	1	NONE	< 1.0	-	-
Ethylbenzene	µg/kg	1	NONE	< 1.0	-	-
p & m-xylene	µg/kg	1	NONE	< 1.0	-	-
o-xylene	µg/kg	1	NONE	< 1.0	-	-
Total BTEX	µg/kg	10	NONE	< 10	-	-
Petroleum Hydrocarbons						
Mineral Oil (C10 - C40) EH_CU_1D_AL	mg/kg	10	NONE	20	-	-
PCBs by GC-MS						
PCB Congener 28	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 52	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 101	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 138	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 153	mg/kg	0.001	NONE	< 0.001	-	-
PCB Congener 180	mg/kg	0.001	NONE	< 0.001	-	-
Total PCBs by GC-MS						
Total PCBs	mg/kg	0.007	NONE	< 0.007	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

Lab Sample Number				2501287
Sample Reference				DS01
Sample Number				None Supplied
Depth (m)				0.20
Date Sampled				15/11/2022
Time Taken				None Supplied
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
10:1 WAC Leachate				
Arsenic	mg/l	0.001	ISO 17025	0.0068
Barium	mg/l	0.00005	ISO 17025	0.0295
Cadmium	mg/l	0.0001	ISO 17025	< 0.0001
Chromium	mg/l	0.0004	ISO 17025	0.012
Copper	mg/l	0.0007	ISO 17025	0.071
Mercury	mg/l	0.0005	ISO 17025	< 0.0005
Molybdenum	mg/l	0.0004	ISO 17025	0.002
Nickel	mg/l	0.0003	ISO 17025	0.0069
Lead	mg/l	0.001	ISO 17025	0.082
Antimony	mg/l	0.0017	ISO 17025	< 0.0017
Selenium	mg/l	0.004	ISO 17025	< 0.0040
Zinc	mg/l	0.0004	ISO 17025	0.035
Chloride	mg/l	0.15	ISO 17025	7.8
Fluoride	mg/l	0.05	ISO 17025	0.11
Sulphate	mg/l	0.1	ISO 17025	6.2
Total dissolved solids	mg/l	4	ISO 17025	89
Total monohydric phenols	mg/l	0.01	ISO 17025	< 0.010
Dissolved organic carbon	mg/l	0.1	NONE	18
10:1 WAC Leachate				
Arsenic	mg/kg	0.01	NONE	0.0534
Barium	mg/kg	0.0005	NONE	0.232
Cadmium	mg/kg	0.0008	NONE	< 0.0008
Chromium	mg/kg	0.004	NONE	0.096
Copper	mg/kg	0.007	NONE	0.56
Mercury	mg/kg	0.005	NONE	< 0.0050
Molybdenum	mg/kg	0.004	NONE	0.0155
Nickel	mg/kg	0.003	NONE	0.054
Lead	mg/kg	0.01	NONE	0.65
Antimony	mg/kg	0.017	NONE	< 0.017
Selenium	mg/kg	0.04	NONE	< 0.040
Zinc	mg/kg	0.004	NONE	0.28
Chloride	mg/kg	1.5	NONE	61
Fluoride	mg/kg	0.5	NONE	0.83
Sulphate	mg/kg	1	NONE	48
Total dissolved solids	mg/kg	40	ISO 17025	700
Total monohydric phenols	mg/kg	0.1	NONE	< 0.10
Dissolved organic carbon	mg/kg	1	NONE	141

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
2501284	DS01	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2501285	DS01	None Supplied	2.2	Brown sand with gravel and stones.
2501286	HP01	None Supplied	0.5	Brown gravel with vegetation and stones.**

**NON MCERTS MATRIX

Analytical Report Number : 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance an Sampling and Testing of Wastes to Meet Landfill Waste Acceptance""	L046-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In house method.	L047-PL	D	MCERTS
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270.	L064-PL	D	NONE
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
pH at 20oC in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In house method.	L005-PL	W	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

Analytical Report Number : 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073B-PL	W	NONE
Total BTEX in soil (Poland)	Determination of BTEX in soil by headspace GC-MS. Individual components MCERTS accredited	In-house method based on USEPA8260	L073-PL	W	NONE
Fraction Organic Carbon FOC Automated	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method	L009	D	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by EC probe using a factor of 0.6.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L031	W	ISO 17025
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE

For method numbers ending in 'UK or A' analysis have been carried out in our laboratory in the United Kingdom (WATFORD).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL or B' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.
Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions

Analytical Report Number : 22-97005
Project / Site name: 56 The Meadway, Shoreham-By-Sea, BN43 5RP

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
HS	Headspace Analysis				
MS	Mass spectrometry				
FID	Flame Ionisation Detector				
GC	Gas Chromatography				
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))				
CU	Clean-up - e.g. by Florisil®, silica gel				
1D	GC - Single coil/column gas chromatography				
2D	GC-GC - Double coil/column gas chromatography				
Total	Aliphatics & Aromatics				
AL	Aliphatics				
AR	Aromatics				
#1	EH_2D_Total but with humics mathematically subtracted				
#2	EH_2D_Total but with fatty acids mathematically subtracted				
_	Operator - understore to separate acronyms (exception for +)				
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total				

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

YJQWN-H3OAF-8MPL1

Job name

56 The Meadway

Description/Comments

Project

LS6595

Site

56 The Meadway

Classified by

Name:
Tom Kistruck
Date:
06 Dec 2022 09:56 GMT
Telephone:
01444 882 084

Company:
Land Science
Unit 10
19 Albert Drive
Burgess Hill
RH15 9TN

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: -

Course	Date
Hazardous Waste Classification	-

Purpose of classification

4 - Classification of Waste Products

Address of the waste

Post Code

SIC for the process giving rise to the waste

Description of industry/producer giving rise to the waste

Description of the specific process, sub-process and/or activity that created the waste

Description of the waste

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	DS01	0.20	Hazardous	HP 7, HP 14	3

Related documents

#	Name	Description
1	Land Science Template WM3 v1.2GB	waste stream template used to create this Job

Report

Created by: Tom Kistruck

Created date: 06 Dec 2022 09:56 GMT

Appendices	Page
Appendix A: Classifier defined and non GB MCL determinands	6
Appendix B: Rationale for selection of metal species	7
Appendix C: Version	8

Classification of sample: DS01

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample name:
DS01
Sample Depth:
0.20 m
Moisture content:
22%
(no correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1A; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.13%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinands:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.13%)
zinc sulphate: (compound conc.: 0.138%)

Determinands

Moisture content: 22% No Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
1		pH		PH		8.5	pH		8.5	pH	8.5 pH		
2		phenol				<1	mg/kg		<1	mg/kg	<0.0001 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
3		naphthalene				0.33	mg/kg		0.33	mg/kg	0.000033 %		
		601-052-00-2	202-049-5	91-20-3									
4		acenaphthylene				0.22	mg/kg		0.22	mg/kg	0.000022 %		
			205-917-1	208-96-8									
5		acenaphthene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
			201-469-6	83-32-9									
6		fluorene				0.23	mg/kg		0.23	mg/kg	0.000023 %		
			201-695-5	86-73-7									
7		phenanthrene				3.3	mg/kg		3.3	mg/kg	0.00033 %		
			201-581-5	85-01-8									
8		anthracene				0.45	mg/kg		0.45	mg/kg	0.000045 %		
			204-371-1	120-12-7									
9		fluoranthene				7.1	mg/kg		7.1	mg/kg	0.00071 %		
			205-912-4	206-44-0									

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
10	pyrene		204-927-3	129-00-0		6.2 mg/kg		6.2 mg/kg	0.00062 %		
11	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		3.7 mg/kg		3.7 mg/kg	0.00037 %		
12	chrysene	601-048-00-0	205-923-4	218-01-9		4.9 mg/kg		4.9 mg/kg	0.00049 %		
13	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		6.2 mg/kg		6.2 mg/kg	0.00062 %		
14	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		2.7 mg/kg		2.7 mg/kg	0.00027 %		
15	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		5.1 mg/kg		5.1 mg/kg	0.00051 %		
16	indeno[123-cd]pyrene		205-893-2	193-39-5		2.8 mg/kg		2.8 mg/kg	0.00028 %		
17	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		0.72 mg/kg		0.72 mg/kg	0.000072 %		
18	benzo[ghi]perylene		205-883-8	191-24-2		2.9 mg/kg		2.9 mg/kg	0.00029 %		
19	coronene		205-881-7	191-07-1		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
20	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	17.164 mg/kg	0.00172 %		
21	barium { barium sulfate }		231-784-4	7727-43-7		370 mg/kg	1.7	628.821 mg/kg	0.0629 %		
22	beryllium { beryllium oxide }	004-003-00-8	215-133-1	1304-56-9		0.89 mg/kg	2.775	2.47 mg/kg	0.000247 %		
23	boron { diboron trioxide; boric oxide }	005-008-00-8	215-125-8	1303-86-2		2.7 mg/kg	3.22	8.694 mg/kg	0.000869 %		
24	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1 mg/kg	1.142	1.142 mg/kg	0.000114 %		
25	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<1.2 mg/kg	1.923	<2.308 mg/kg	<0.000231 %		<LOD
26	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		130 mg/kg	1.126	146.365 mg/kg	0.0146 %		
27	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	1300 mg/kg		1300 mg/kg	0.13 %		
28	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
29	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17 mg/kg	2.976	50.597 mg/kg	0.00506 %		
30	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
31	vanadium { divanadium pentaoxide; vanadium pentoxide }	023-001-00-8	215-239-8	1314-62-1		31 mg/kg	1.785	55.341 mg/kg	0.00553 %		
32	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		560 mg/kg	2.469	1382.806 mg/kg	0.138 %		
33	benzene	601-020-00-8	200-753-7	71-43-2		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
34	toluene	601-021-00-3	203-625-9	108-88-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
35	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD

#		Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number							
36		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]									
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<1 mg/kg		<1 mg/kg	<0.0001 %		<**LOD**
37	•	polychlorobiphenyls; PCB									
		602-039-00-4	215-648-1	1336-36-3		<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<**LOD**
								Total:	0.365 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non GB MCL determinands

- **pH** (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

- **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

- **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

- **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source: http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2; H371

barium sulfate (EC Number: 231-784-4, CAS Number: 7727-43-7)

Description/Comments: No hazard statements
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/89983 Sigma Aldrich SDS dated 15/4/19
Data source date: 02 Apr 2020
Hazard Statements: None.

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

GB MCL index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following MCL protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

divanadium pentaoxide; vanadium pentoxide (EC Number: 215-239-8, CAS Number: 1314-62-1)

GB MCL index number: 023-001-00-8
Description/Comments:
Additional Hazard Statement(s): Carc. 1B; H350 , Acute Tox. 3; H301 , Acute Tox. 2; H330
Reason for additional Hazards Statement(s):
20 Sep 2022 - Carc. 1B; H350 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be Carc. 1B; H350. The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 3; H301 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 3; H301". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.
28 Sep 2022 - Acute Tox. 2; H330 hazard statement sourced from: ATP 18 (Regulation (EU) 2022/692) considers vanadium pentoxide to be "Acute tox 2; H330". The GB MCL Agency has reached the same opinion [but is yet to formerly make this change to the MCL List]. Substance has therefore been self-classified.

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

GB MCL index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

barium {barium sulfate}

No hexavalent chromium detected.

beryllium {beryllium oxide}

Reasonable case CLP species based on hazard statements/molecular weight. Industrial sources include: most common (non alloy) form, used in ceramics (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

No hexavalent chromium detected.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

vanadium {divanadium pentaoxide; vanadium pentoxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc sulphate}

No hexavalent chromium detected.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2022.325.5408.10064 (21 Nov 2022)
HazWasteOnline Database: 2022.325.5408.10064 (21 Nov 2022)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021

WASTE ACCEPTANCE CRITERIA
(WAC) ASSESSMENT

Site: LS6595 - 56 The Meadway
Date: 06/12/2022

Assesment Criteria												
	Inert Waste Landfill	**SNRHW Landfill**	**Hazardous Waste Landfill**	**Sample**	Position	**DS01**	-	-	-	-	-	-
					Depth	**0.20**	-	-	-	-	-	-
					Sample ref	**None Supplied**	-	-	-	-	-	-
					Preliminary Hazardous Assessment*	Hazardous						
	--	6.0	--	**Solid Analysis**	pH (units)	8.2	-	-	-	-	-	-
	3	5	6		Total Organic Carbon (TOC) (%)	4	-	-	-	-	-	-
	--	--	10		Loss on Ignition @ 450oC (%)	8.6	-	-	-	-	-	-
	--	to be evaluated			Acid Neutralisation Capacity (mol/kg)	4.8	-	-	-	-	-	-
	6000	--	--		BTEX (µg/kg)	0	-	-	-	-	-	-
	1	--	--		Total PCB's (mg/kg)	0	-	-	-	-	-	-
	500	--	--		Mineral Oil (mg/kg)	< 0.001	-	-	-	-	-	-
	100	--	--		Total PAH (mg/kg)	47.1	-	-	-	-	-	-
	0.50	2	25	**10:1 WAC Leachate Analysis (mg/kg equivalent)**	Arsenic	0.0534	-	-	-	-	-	-
	20	100	300		Barium	0.232	-	-	-	-	-	-
	0.0400	1	5		Cadmium	< 0.0008	-	-	-	-	-	-
	0.5	10	70		Chromium	0.096	-	-	-	-	-	-
	2	50	100		Copper	0.56	-	-	-	-	-	-
	0.01	0.2	2		Mercury	< 0.0050	-	-	-	-	-	-
	0.500	10	30		Molybdenum	0.0155	-	-	-	-	-	-
	0.400	10	40		Nickel	0.054	-	-	-	-	-	-
	0.5	10	50		Lead	0.65	-	-	-	-	-	-
	0.060	0.7	5		Antimony	< 0.017	-	-	-	-	-	-
	0.10	0.5	7		Selenium	< 0.040	-	-	-	-	-	-
	4	50	200		Zinc	0.28	-	-	-	-	-	-
	800	15000	25000		Chloride	61	-	-	-	-	-	-
	10	150	500		Fluoride	0.83	-	-	-	-	-	-
	1000	20000	50000		Sulphate	48	-	-	-	-	-	-
	4000	60000	100000		Total dissolved solids	700	-	-	-	-	-	-
	1	--	--		Total monohydric phenols	< 0.10	-	-	-	-	-	-
	500	800	1000		Dissolved organic carbon	141	-	-	-	-	-	-
					Classification	**SNRHW**						

*Soils are classified as Hazardous or Non-Hazardous based on the total soils analysis. The WAC test is then used to potentially sub-classify as Inert or Stable Non-Reactive Hazardous Waste (SNRHW). Where a material is Hazardous, a WAC test is mandatory, and where it **exceeds** the Hazardous waste limit, the material must be pre-treated to reduce the hazardous constituents to be below the WAC limit.*

Unit 10, 19 Albert Drive, Burgess Hill, **West Sussex,** RH15 9TN
2nd Floor, 25-28 Field Street, **London,** WC1X 9DA
W: www.landscience.co.uk **T:** 03456046494

APPENDIX F

Envirocheck® Report:

Mining and Ground Stability Datasheet

Order Details:

Order Number:
304309503_1_1

Customer Reference:
LS6595

National Grid Reference:
522150, 104680

Slice:
A

Site Area (Ha):
0.04

Search Buffer (m):
1000

Site Details:

56, The Meadway
SHOREHAM-BY-SEA
BN43 5RP

Client Details:

Mr E Toms
Land Science Ltd
Unit 10
19 Albert Drive
Burgess Hill
West Sussex
RH15 9TN

Contents

Report Section and Details	Page Number
Summary	-
The Summary section provides an overview of the data contained within the report, detailing the number of data set features or the existence of a data set in relation to the buffer selected. For ease of reference, the report is broken down into 4 sections of data; Mining and Natural Cavities Data, Historical Land Use Information (1:2,500), Historical Land Use Information (1:10,000) and Ground Stability Data (1:50,000).	
Mining and Natural Cavities Data	1
The Mining and Natural Cavities Data section features data sets related to the existence of mining areas and their potential hazards; and details of naturally formed cavities. Data sets within this section are not plotted, with the exception of BGS Recorded Mineral Sites and Potential Mining Areas which feature on the Historical Land Use Information (1:10,000) map.	
Historical Land Use Information (1:2,500)	-
The Historical Land Use Information (1:2,500) section contains data captured from analysis carried out by Landmark of 1:1,250 and 1:2,500 scale historical Ordnance Survey mapping, identifying areas where, historically, the land uses were potentially contaminative. For the purpose of this Envirocheck module, only historical data relating to mining and ground stability has been included and plotted on the corresponding Historical Land Use Information (1:2,500) map. This section also includes the Subterranean Features data set, which details various man-made and man-used underground spaces obtained from the Subterranea Britannica society.	
Historical Land Use Information (1:10,000)	2
The Historical Land Use (1:10,000) section covers data captured from the systematic analysis carried out by Landmark of 1:10, 560 and 1:10,000 scale historical Ordnance Survey mapping dating back to the mid-19th century, identifying potentially contaminative past industrial land uses. For the purpose of this Envirocheck module, only data relating to mining and ground stability has been included and plotted on the accompanying Historical Land Use Information (1:10,000) map.	
Ground Stability Data (1:50,000)	3
The Ground Stability (1:50,000) section includes the BGS Geosure data suite, reporting features to 250m and plotted onto 3 separate maps. Also reported is brine subsidence, brine mining and salt mining data sets, of which Brine Pumping and Salt Mining Related Features are plotted, and subsidence insurance claims and insurance investigations data, which is not plotted.	
Historical Map List	4
The Historical Map List section details the historical mapping that has been analysed for your site, in relation to the Historical Land Use Information sections.	
Data Currency	5
Data Suppliers	6
Useful Contacts	7

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The brine subsidence data relating to the Driotwich area as provided in this report is derived from JPB studies and physical monitoring undertaken annually over more than 35 years. For more detailed interpretation contact enquiries@jpb.co.uk. JPB retain the copyright and intellectual rights to this data and accept no liability for any loss or damage, including in direct or consequential loss, arising from the use of this data.

The Mining Instability data was obtained on licence from Ove Arup & Partners Limited (for further information, contact mining.review@arup.com). No reproduction or further use of such Data is to be made without the prior written consent of Ove Arup & Partners Limited. The supplied Mining Instability data is derived from publicly available records and other third party sources and neither Ove Arup & Partners nor Landmark warrant the accuracy or completeness of such information or data.

Report Version v53.0

Land Science

Summary

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m
Mining and Natural Cavities Data					
BGS Recorded Mineral Sites	pg 1			1	3
Coal Mining Affected Areas			n/a	n/a	n/a
Man Made Mining Cavities					
Mining Instability			n/a	n/a	n/a
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential Mining Areas					
Historical Land Use Information (1:2,500)					
Extractive Industries or Potential Excavations from 1855-1909 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1893-1915 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1906-1937 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1924-1949 (100m)				n/a	n/a
Extractive Industries or Potential Excavations from 1950-1980 (100m)				n/a	n/a
Subterranean Features (100m)				n/a	n/a
Historical Land Use Information (1:10,000)					
Air Shafts					
Disturbed Ground					
General Quarrying					
Heap, unknown constituents					
Mineral Railway	pg 2		1		1
Mining & quarrying general					
Mining of coal & lignite					
Quarrying of sand & clay, operation of sand & gravel pits	pg 2			1	
Former Marshes					
Potentially Infilled Land (Non-Water)	pg 2				2
Potentially Infilled Land (Water)					
Ground Stability Data (1:50,000)					
CBSCB Compensation District			n/a	n/a	n/a
Brine Pumping Related Features					
Brine Subsidence Solution Area					
Potential for Collapsible Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 3	Yes	Yes	n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards	pg 3	Yes		n/a	n/a
Salt Mining Related Features					

Summary

Report Version v53.0

Mining and Natural Cavities Data

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
1	**BGS Recorded Mineral Sites** Site Name: Shoreham Aggregate Wharf Location: Shoreham-By-Sea, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 10881 Type: Wharf **Status: Active** Operator: Aggregate Industries Uk Operator Location: Not Supplied Periodic Type: Quaternary Geology: Marine Deposits Commodity: Marine Sand And Gravel Positional Accuracy: Located by supplier to within 10m	A18SE (NE)	397	1	522340 105045
2	**BGS Recorded Mineral Sites** Site Name: Shoreham Beach Brick Field Location: Shoreham Beach, Shoreham-By-Sea, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 157920 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Quaternary Geology: Brickearth Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A19SW (NE)	635	1	522619 105129
3	**BGS Recorded Mineral Sites** Site Name: Kingston By Sea Brick Field Location: Kingston By Sea, Shoreham-By-Sea, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 157933 Type: Opencast **Status: Ceased** Operator: Unknown Operator Operator Location: Not Supplied Periodic Type: Quaternary Geology: Head Commodity: Common Clay and Shale Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	837	1	522512 105450
4	**BGS Recorded Mineral Sites** Site Name: Kingston Railway Wharf Location: Shoreham, West Sussex Source: British Geological Survey, National Geoscience Information Service Reference: 226066 Type: Wharf **Status: Ceased** Operator: Day Aggregates Operator Location: Not Supplied Periodic Type: Quaternary Geology: Marine Deposits Commodity: Marine Sand And Gravel Positional Accuracy: Located by supplier to within 10m	A19SE (E)	919	1	523015 105025
	Coal Mining Affected Areas In an area which may not be affected by coal mining				
	Non Coal Mining Areas of Great Britain No Hazard				

Historical Land Use Information (1:10,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
5	**Mineral Railway** Use: Not Supplied Date of Mapping: 1912	A13NE (NE)	66	-	522223 104712
6	**Mineral Railway** Use: Not Supplied Date of Mapping: 1984	A17SW (NW)	998	-	521354 105297
7	**Quarrying of sand & clay, operation of sand & gravel pits** Use: Not Supplied Date of Mapping: 1948	A14NW (E)	475	-	522622 104797
8	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1984	A18SE (NE)	512	-	522381 105153
9	**Potentially Infilled Land (Non-Water)** Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1984	A18NE (NE)	752	-	522457 105381

Ground Stability Data (1:50,000)

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	CBSCB Compensation District The site does not fall within the brine compensation area.				
	Brine Subsidence Solution Area The site does not fall within the brine subsidence solution area.				
10	**Potential for Collapsible Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	219	1	522226 104900
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	522154 104678
11	**Potential for Compressible Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	163	1	522161 104501
12	**Potential for Compressible Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	202	1	522137 104893
13	**Potential for Compressible Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	219	1	522226 104900
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	522154 104678
14	**Potential for Ground Dissolution Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	219	1	522226 104900
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	522154 104678
15	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	522154 104678
16	**Potential for Landslide Ground Stability Hazards** Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	217	1	522250 104467
17	**Potential for Running Sand Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13SE (S)	163	1	522161 104501
18	**Potential for Running Sand Ground Stability Hazards** Hazard Potential: Moderate Source: British Geological Survey, National Geoscience Information Service	A13NW (N)	202	1	522137 104893
19	**Potential for Running Sand Ground Stability Hazards** Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	219	1	522226 104900
	Potential for Running Sand Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	522154 104678
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (N)	0	1	522154 104678

Historical Map List

The following mapping has been analysed for Historical Land Use Information (1:2,500):

1:2,500	Mapsheet	Published Date
Ordnance Survey Plan	TQ2104	1952
Ordnance Survey Plan	TQ2204	1952
Ordnance Survey Plan	TQ2205	1952

The following mapping has been analysed for Historical Land Use Information (1:10,000):

1:10,560	Mapsheet	Published Date
Sussex	065_00	1879
Sussex	065_NW	1899
Sussex	065_SW	1899
Sussex	065_NW	1912
Sussex	065_SW	1912
Sussex	065_NW	1947
Sussex	065_SW	1948
Ordnance Survey Plan	TQ20NW	1963
Ordnance Survey Plan	TQ20SW	1963
1:10,000	**Mapsheet**	**Published Date**
Ordnance Survey Plan	TQ20NW	1984
Ordnance Survey Plan	TQ20SW	1984

Data Currency

Mining and Cavities Data	Version	Update Cycle
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	November 2022	Bi-Annually
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Man Made Mining Cavities Stantec UK Ltd	December 2021	Bi-Annually
Mining Instability Ove Arup & Partners	June 1998	Not Applicable
Natural Cavities Stantec UK Ltd	December 2021	Bi-Annually
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Historical Land Use Information (1:2,500)	**Version**	**Update Cycle**
Subterranean Features Landmark Information Group Limited	June 2022	Bi-Annually
Ground Stability Data (1:50,000)	**Version**	**Update Cycle**
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB) Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011 November 2020	 As notified
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	April 2020	As notified
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	As notified
Brine Subsidence Solution Area Johnson Poole & Bloomer	December 2020	Annual Rolling Update

Data Suppliers

A selection of organisations who provide data within this report

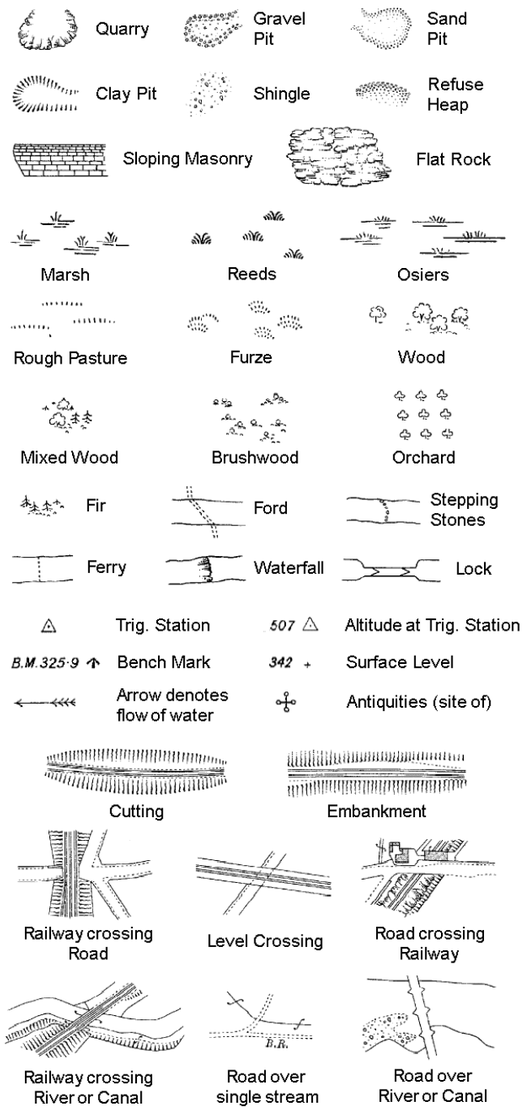
Data Supplier	Data Supplier Logo
Ordnance Survey	
British Geological Survey	
The Coal Authority	
Ove Arup	
Stantec UK Ltd	
Wardell Armstrong	
Johnson Poole & Bloomer	

Useful Contacts

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Historical Mapping Legends

Ordnance Survey County Series and Ordnance Survey Plan 1:2,500



County Boundary (Geographical)

County & Civil Parish Boundary

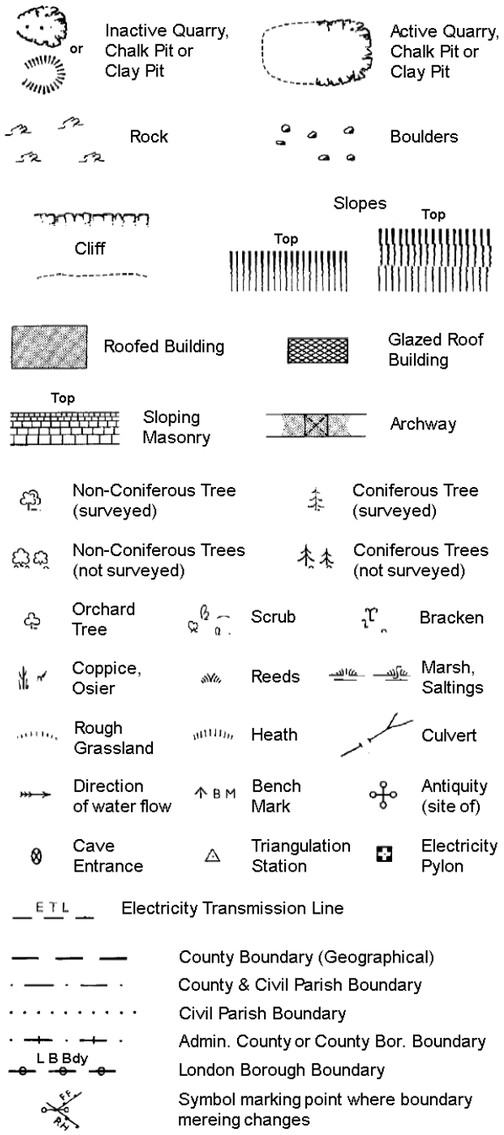
Administrative County & Civil Parish Boundary

Co. Boro. Bdy. County Borough Boundary (England)

Co. Burgh Bdy. County Burgh Boundary (Scotland)

B P B S	Boundary Post or Stone	P.C.B	Police Call Box
B.R.	Bridle Road	P	Pump
E.P	Electricity Pylon	S.P	Signal Post
F.B.	Foot Bridge	St.	Sluice
F.P.	Foot Path	Sp.	Spring
G.P	Guide Post or Board	T.C.B	Telephone Call Box
M.S	Mile Stone	Tr.	Trough
M.P M.R	Mooring Post or Ring	W	Well

Ordnance Survey Plan, Additional SIMs and Supply of Unpublished Survey Information 1:2,500 and 1:1,250



County Boundary (Geographical)

County & Civil Parish Boundary

Civil Parish Boundary

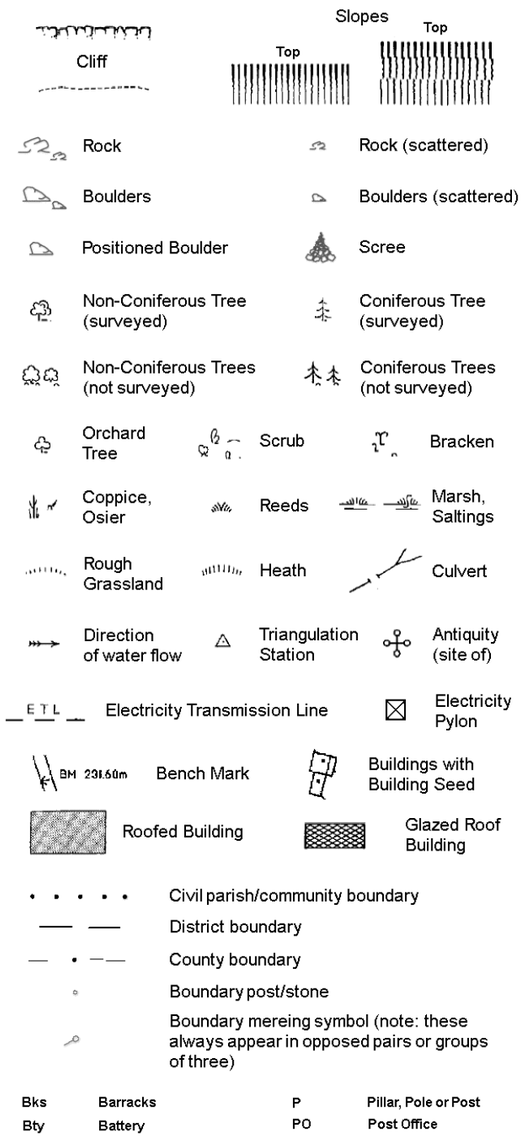
Admin. County or County Bor. Boundary

L B Bdy London Borough Boundary

Symbol marking point where boundary mereing changes

BH	Beer House	P	Pillar, Pole or Post
BP, BS	Boundary Post or Stone	PO	Post Office
Cn, C	Capstan, Crane	PC	Public Convenience
Chy	Chimney	PH	Public House
D Fn	Drinking Fountain	Pp	Pump
El P	Electricity Pillar or Post	SB, S Br	Signal Box or Bridge
FAP	Fire Alarm Pillar	SP, SL	Signal Post or Light
FB	Foot Bridge	Spr	Spring
GP	Guide Post	Tk	Tank or Track
H	Hydrant or Hydraulic	TCB	Telephone Call Box
LC	Level Crossing	TCP	Telephone Call Post
MH	Manhole	Tr	Trough
MP	Mile Post or Mooring Post	Wr Pt, Wr T	Water Point, Water Tap
MS	Mile Stone	W	Well
NTL	Normal Tidal Limit	Wd Pp	Wind Pump

Large-Scale National Grid Data 1:2,500 and 1:1,250



Civil parish/community boundary

District boundary

County boundary

Boundary post/stone

Boundary mereing symbol (note: these always appear in opposed pairs or groups of three)

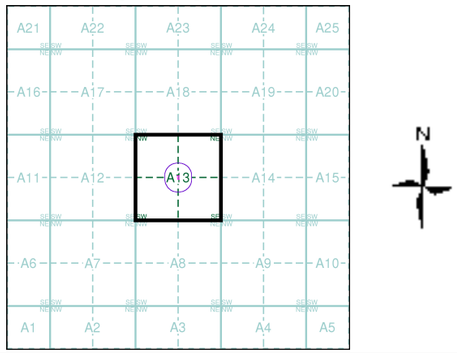
Bks	Barracks	P	Pillar, Pole or Post
Bty	Battery	PO	Post Office
Cemy	Cemetery	PC	Public Convenience
Chy	Chimney	Pp	Pump
Cis	Cistern	Ppg Sta	Pumping Station
Dismtd Rly	Dismantled Railway	PW	Place of Worship
El Gen Sta	Electricity Generating Station	Sewage Ppg Sta	Sewage Pumping Station
El P	Electricity Pole, Pillar	SB, S Br	Signal Box or Bridge
El Sub Sta	Electricity Sub Station	SP, SL	Signal Post or Light
FB	Filter Bed	Spr	Spring
Fn / D Fn	Fountain / Drinking Ftn.	Tk	Tank or Track
Gas Gov	Gas Valve Compound	Tr	Trough
GVC	Gas Governer	Wd Pp	Wind Pump
GP	Guide Post	Wr Pt, Wr T	Water Point, Water Tap
MH	Manhole	Wks	Works (building or area)
MP, MS	Mile Post or Mile Stone	W	Well

Land Science

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Sussex	1:2,500	1873 - 1875	2
Sussex	1:2,500	1898	3
Sussex	1:2,500	1912	4
Sussex	1:2,500	1930 - 1931	5
Ordnance Survey Plan	1:2,500	1952 - 1953	6
Ordnance Survey Plan	1:1,250	1952	7
Ordnance Survey Plan	1:1,250	1962 - 1969	8
Ordnance Survey Plan	1:2,500	1963 - 1970	9
Ordnance Survey Plan	1:1,250	1969 - 1991	10
Supply of Unpublished Survey Information	1:1,250	1974	11
Additional SIMs	1:1,250	1977 - 1980	12
Additional SIMs	1:1,250	1985 - 1991	13
Additional SIMs	1:1,250	1989	14
Large-Scale National Grid Data	1:1,250	1994	15
Historical Aerial Photography	1:2,500	1999	16

Historical Map - Segment A13



Order Details

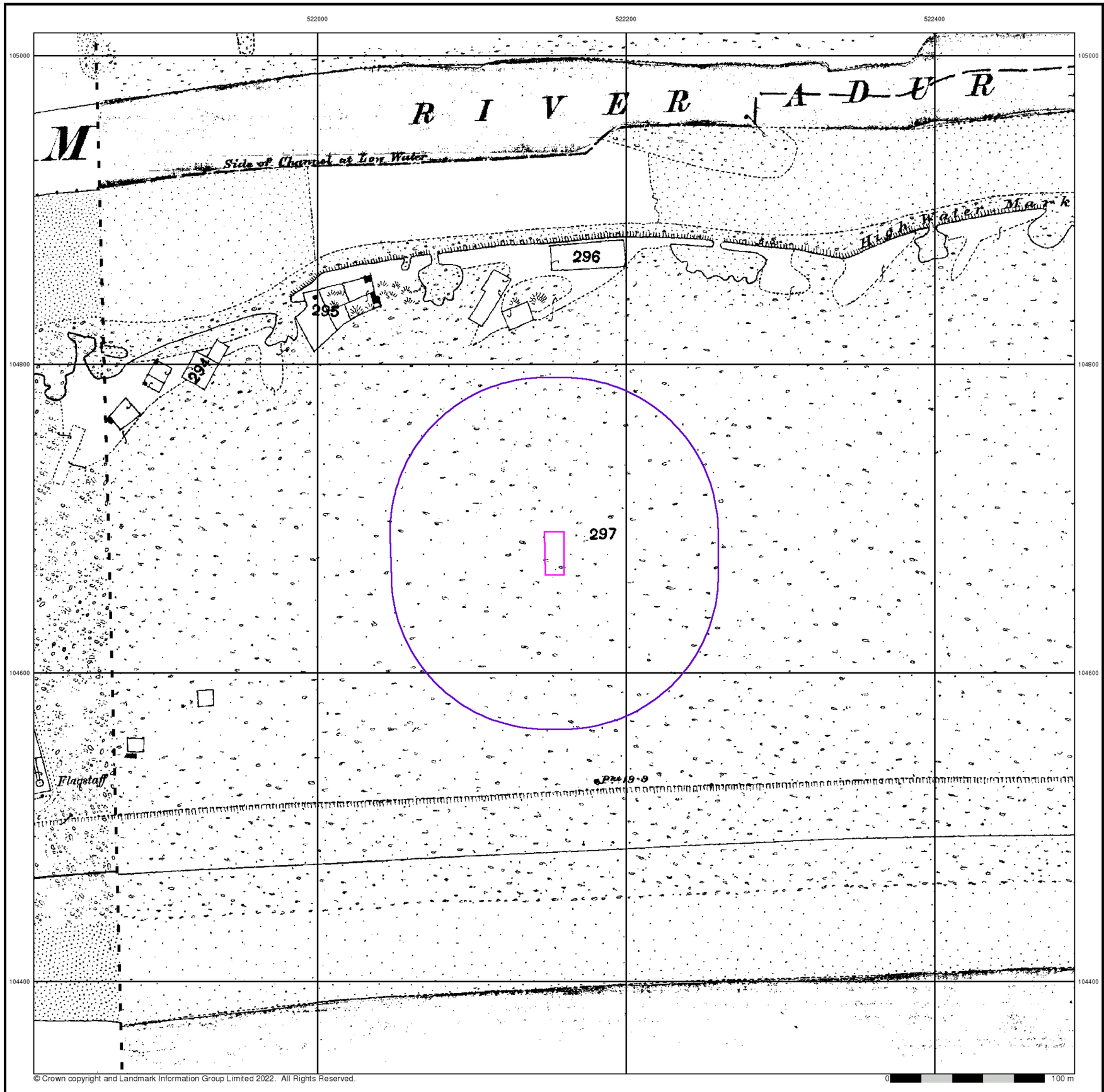
Order Number: 304309503_1_1
Customer Ref: LS6595
National Grid Reference: 522150, 104680
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 100

Site Details

56, The Meadway, SHOREHAM-BY-SEA, BN43 5RP

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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0 100 m

Land Science

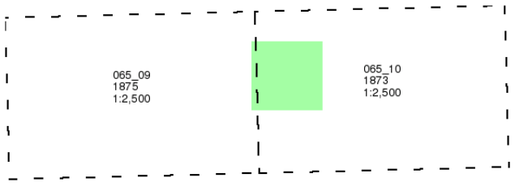
Sussex

Published 1873 - 1875

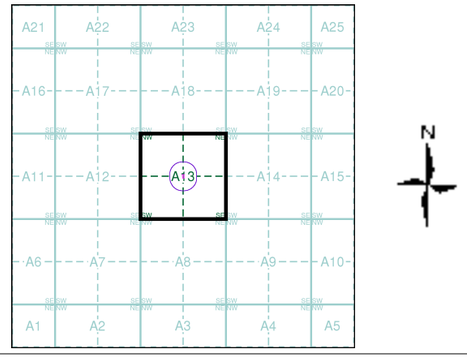
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

56, The Meadway, SHOREHAM-BY-SEA, BN43 5RP

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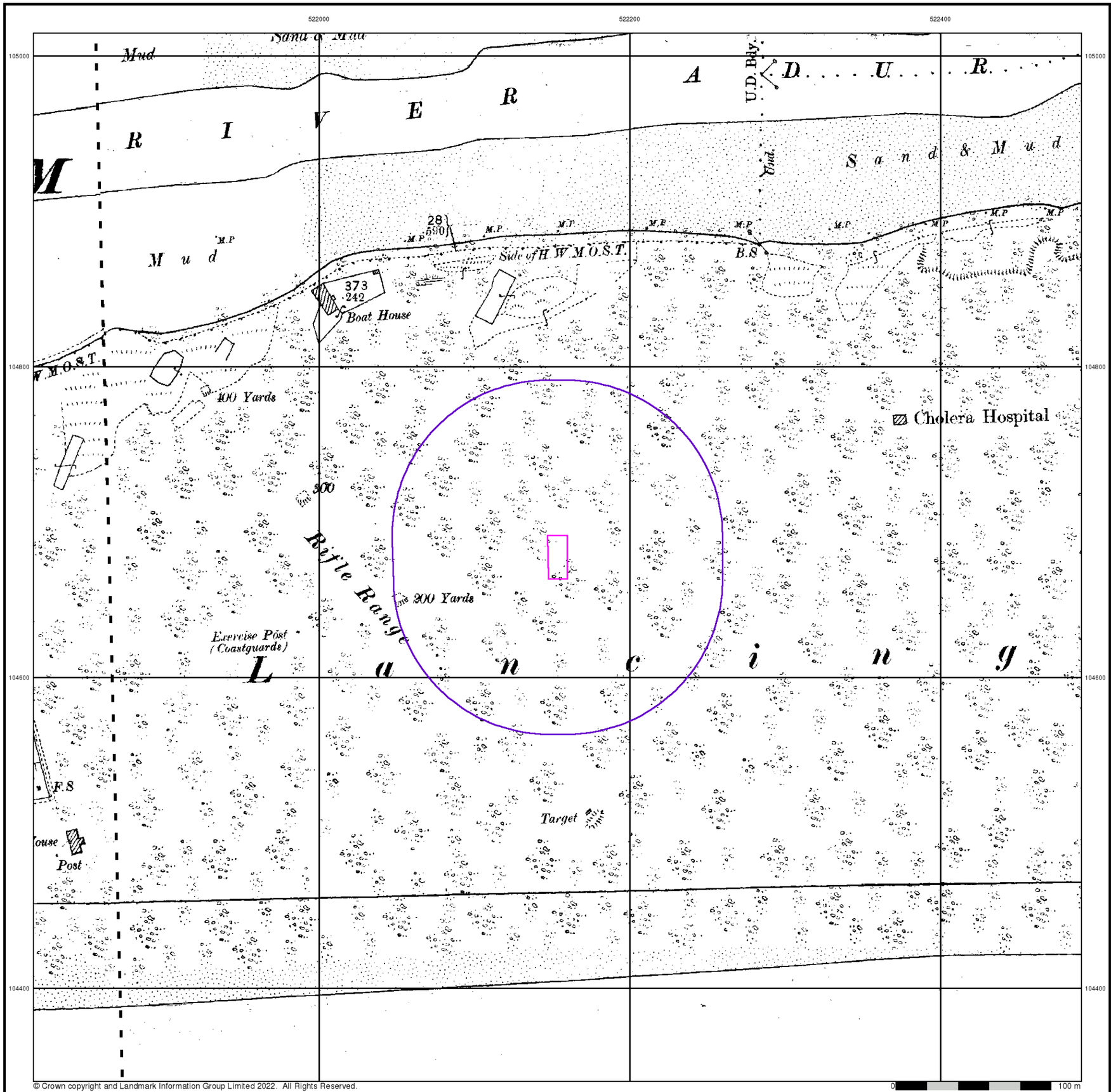


Land Science

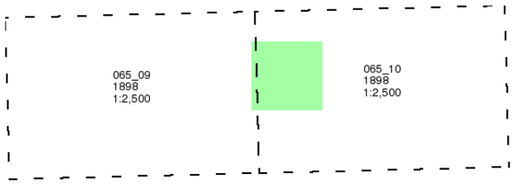
Sussex

Published 1898

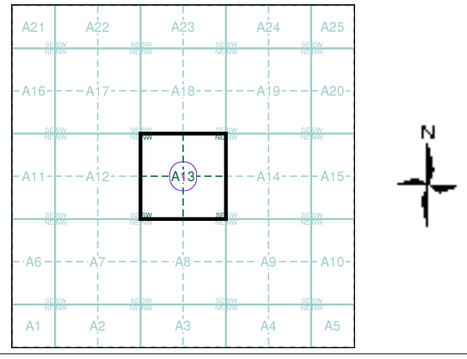
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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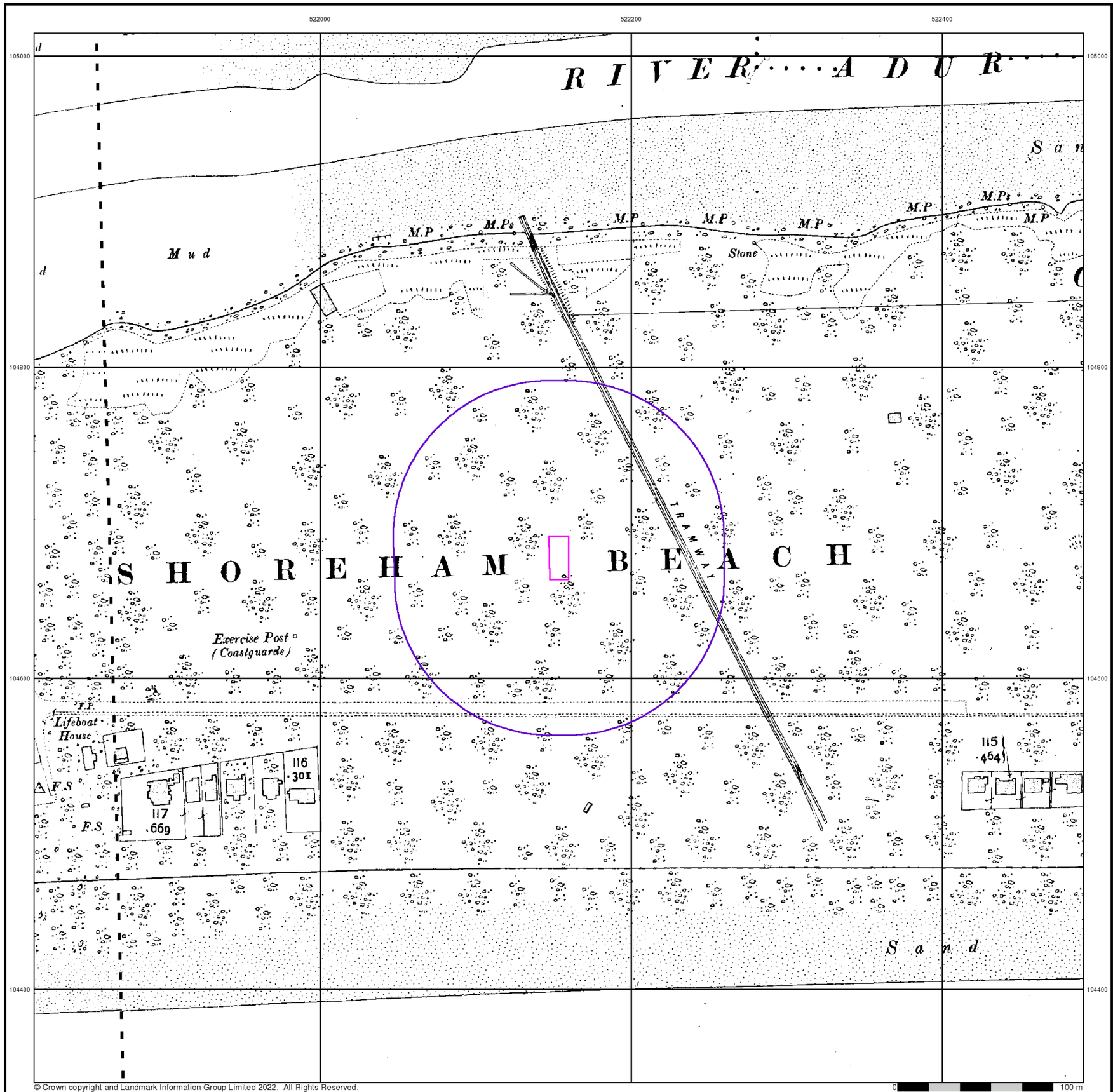


Land Science

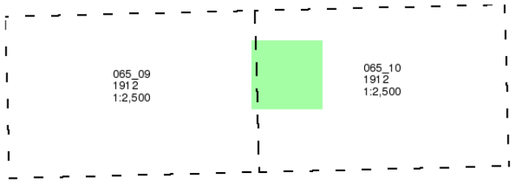
Sussex

Published 1912

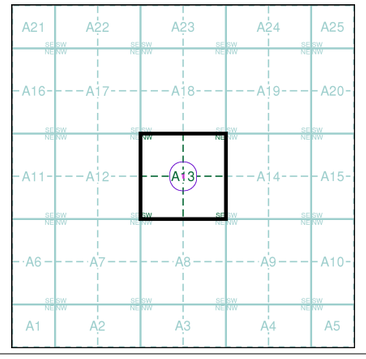
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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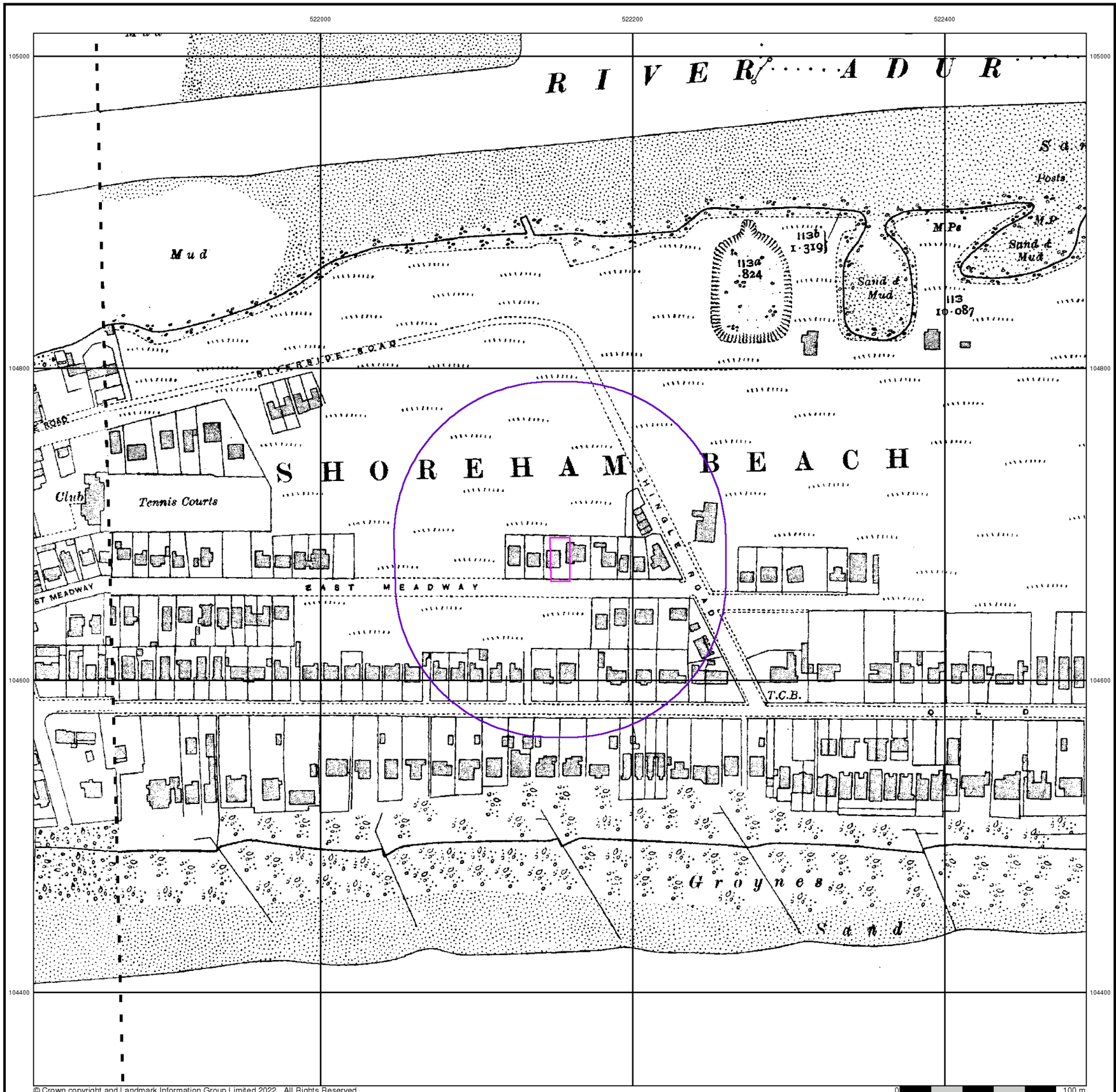

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Land Science

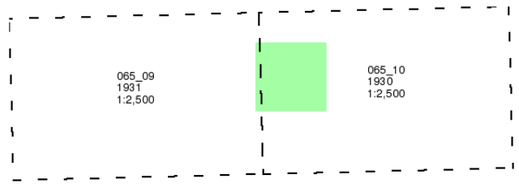
Sussex

Published 1930 - 1931

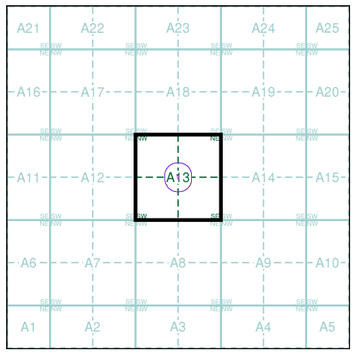
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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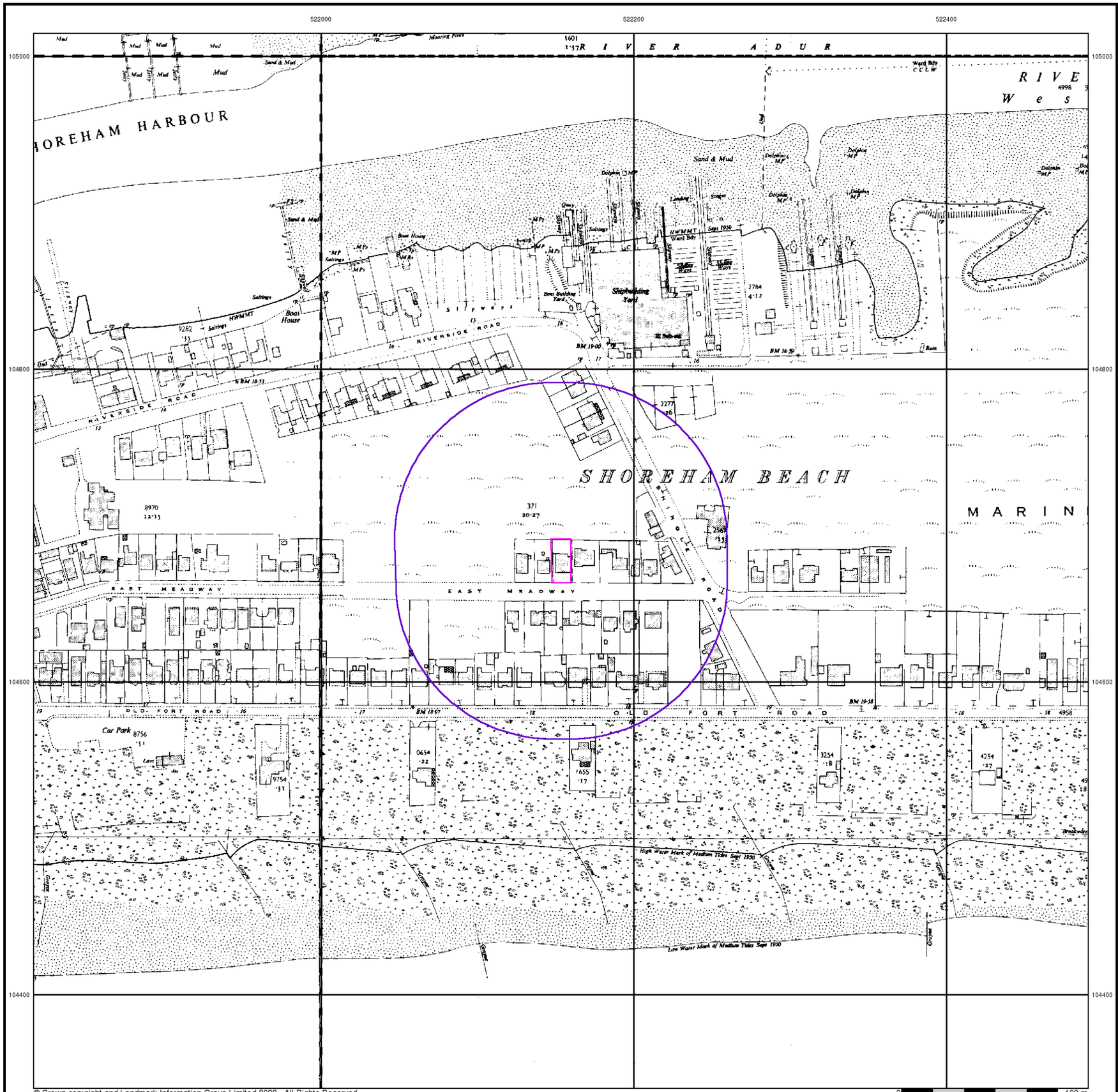


Land Science

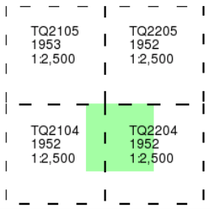
Ordnance Survey Plan

Published 1952 - 1953

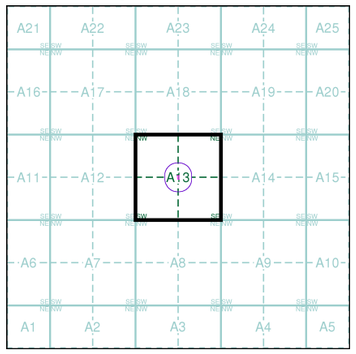
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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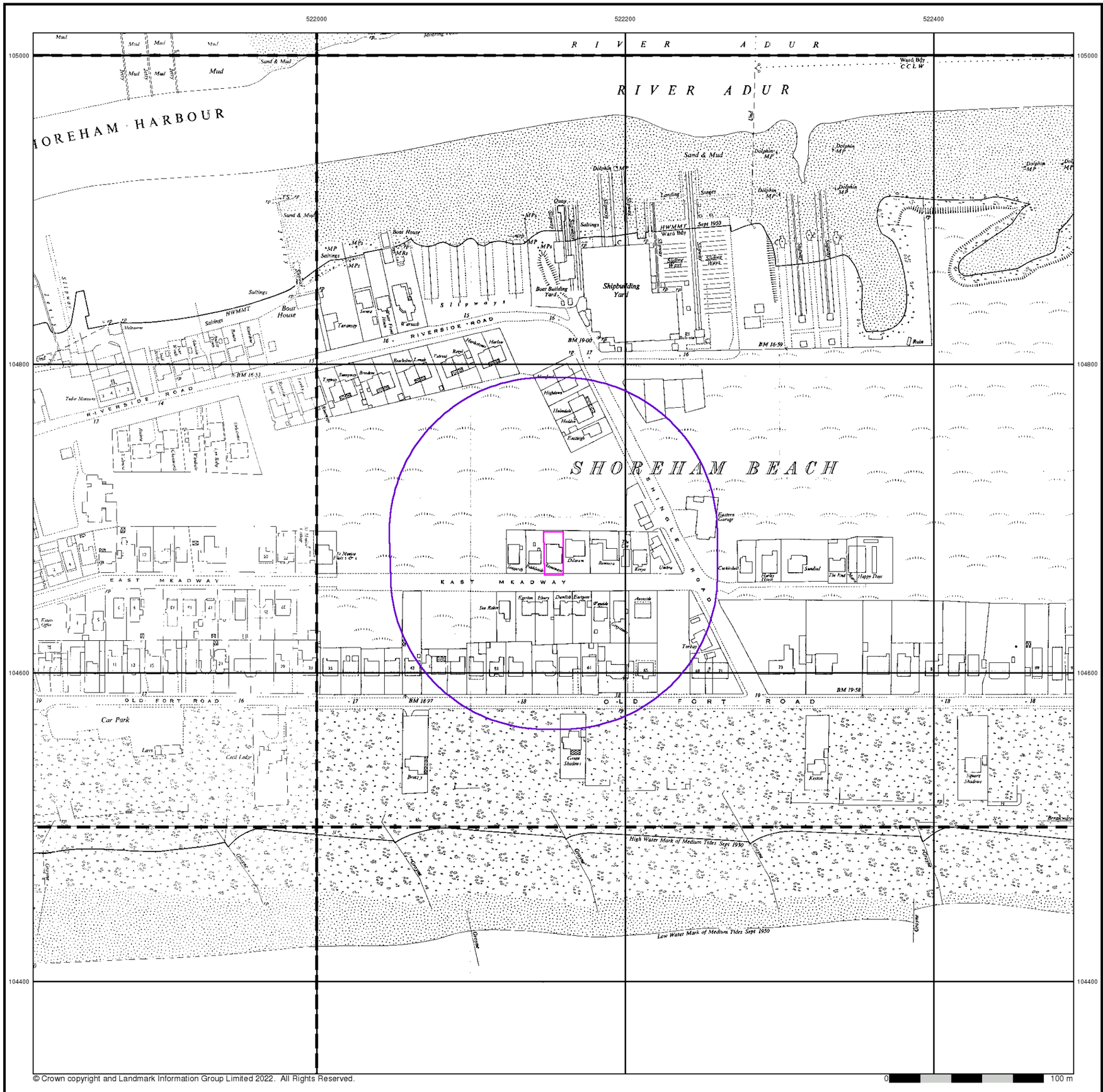

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Land Science

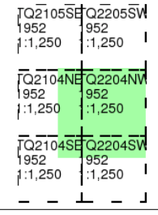
Ordnance Survey Plan

Published 1952

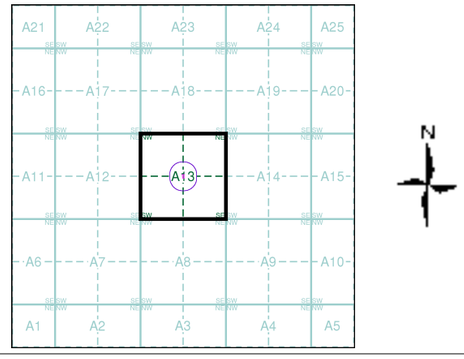
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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Land Science

Ordnance Survey Plan

Published 1962 - 1969

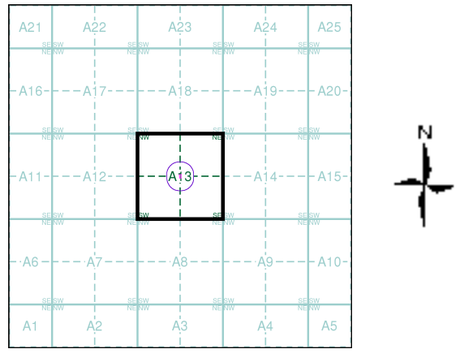
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TQ2105SE 1966 1:1,250	TQ2205SW 969 1:1,250
TQ2104NE 969 1:1,250	TQ2204NW 962 1:1,250
TQ2104SE 969 1:1,250	TQ2204SW 962 1:1,250

Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

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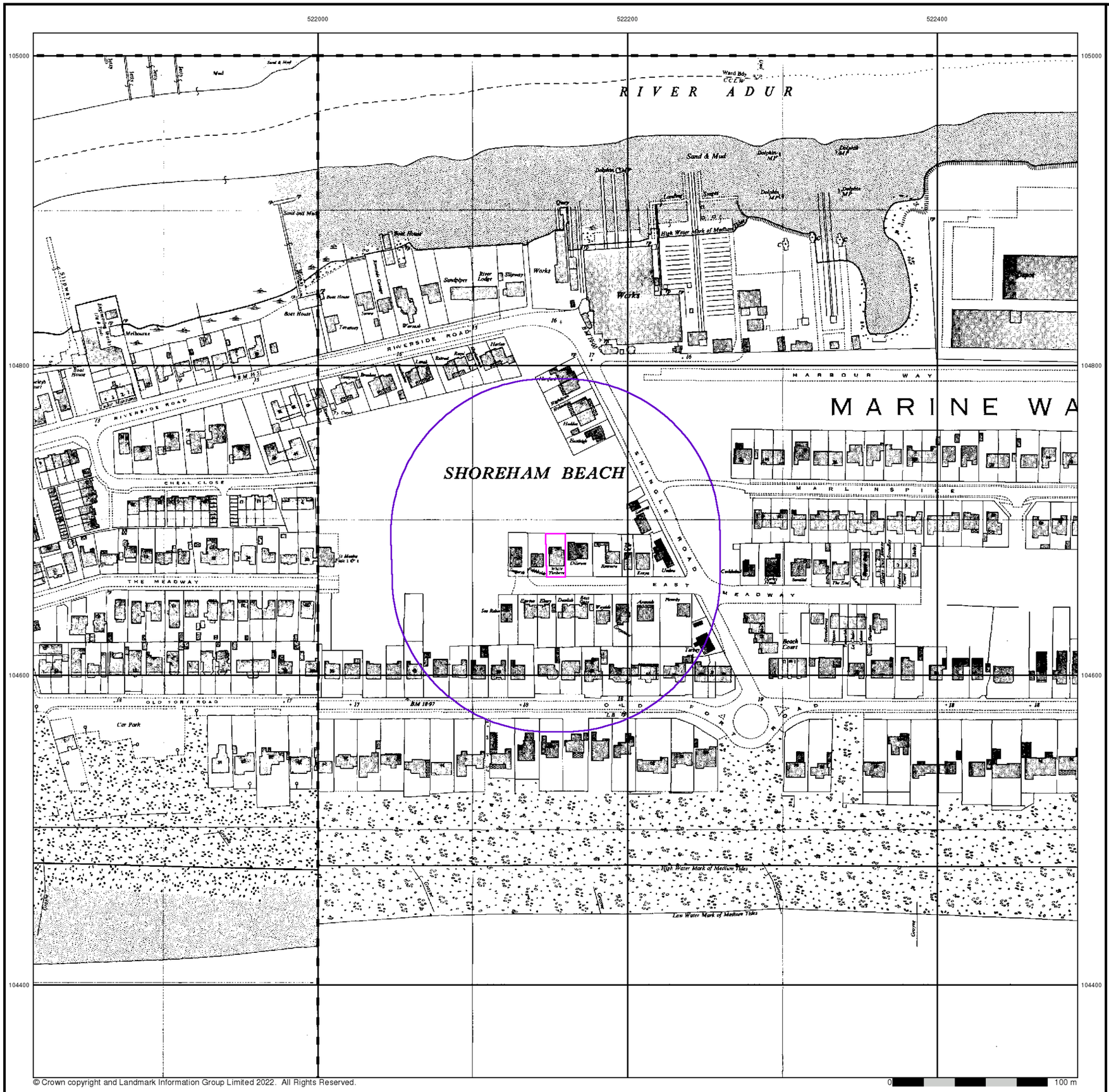

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Land Science

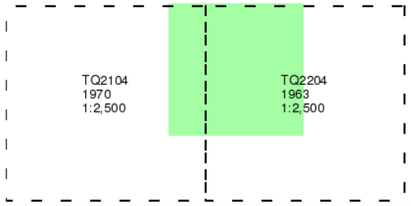
Ordnance Survey Plan

Published 1963 - 1970

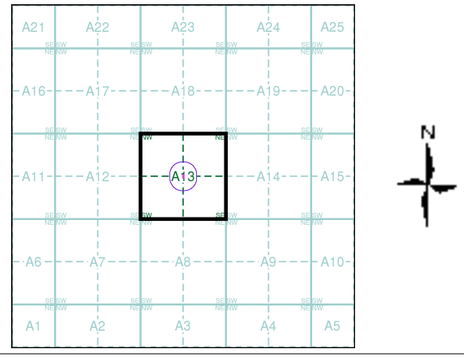
Source map scale - 1:2,500

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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Land Science

Ordnance Survey Plan

Published 1969 - 1991

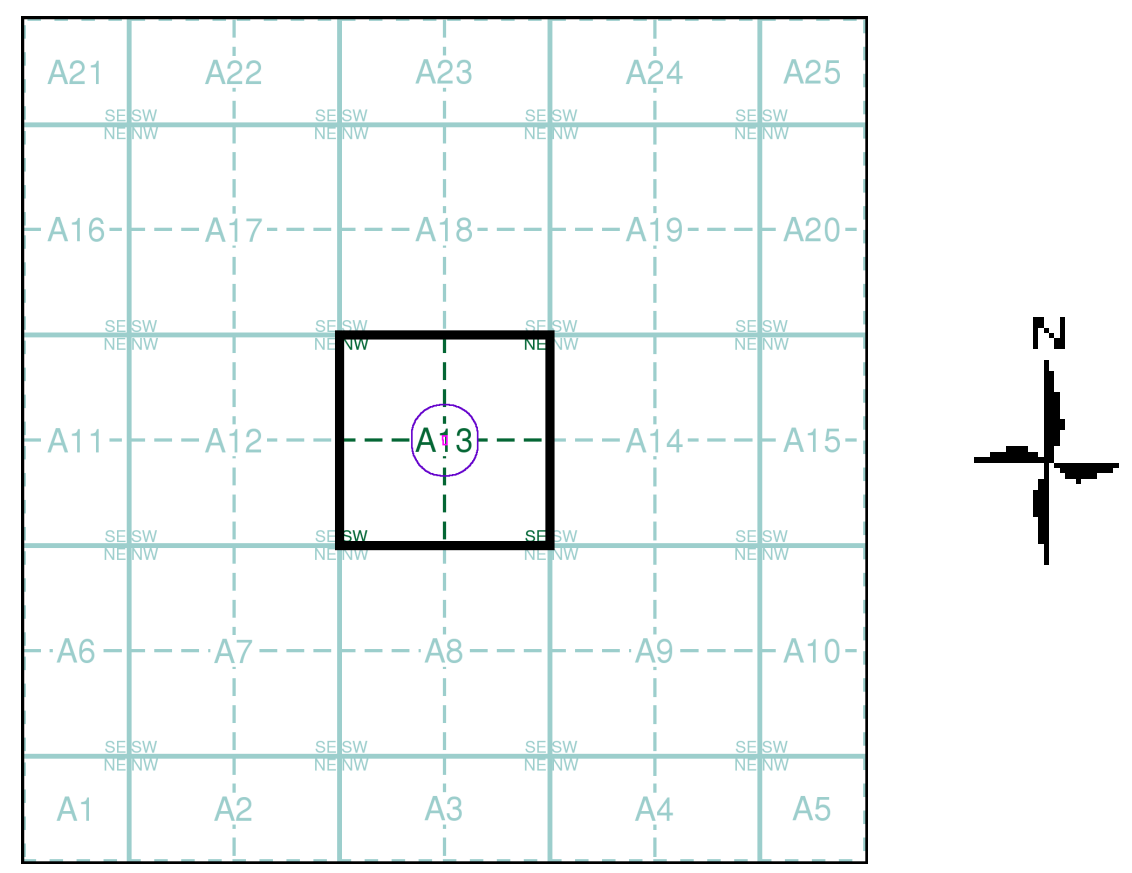
Source map scale - 1:1,250

The historical maps shown were reproduced from maps predominantly held at the scale adopted for England, Wales and Scotland in the 1840`s. In 1854 the 1:2,500 scale was adopted for mapping urban areas and by 1896 it covered the whole of what were considered to be the cultivated parts of Great Britain. The published date given below is often some years later than the surveyed date. Before 1938, all OS maps were based on the Cassini Projection, with independent surveys of a single county or group of counties, giving rise to significant inaccuracies in outlying areas.

Map Name(s) and Date(s)

TQ2105SE 1974 1:1,250	TQ2205SW 1991 1:1,250
TQ2104NE 1984 1:1,250	TQ2204NW 1969 1:1,250
TQ2104SE 1984 1:1,250	TQ2204SW 1969 1:1,250

Historical Map - Segment A13



Order Details

Order Number: 304309503_1_1
Customer Ref: LS6595
National Grid Reference: 522150, 104680
Slice: A
Site Area (Ha): 0.04
Search Buffer (m): 100

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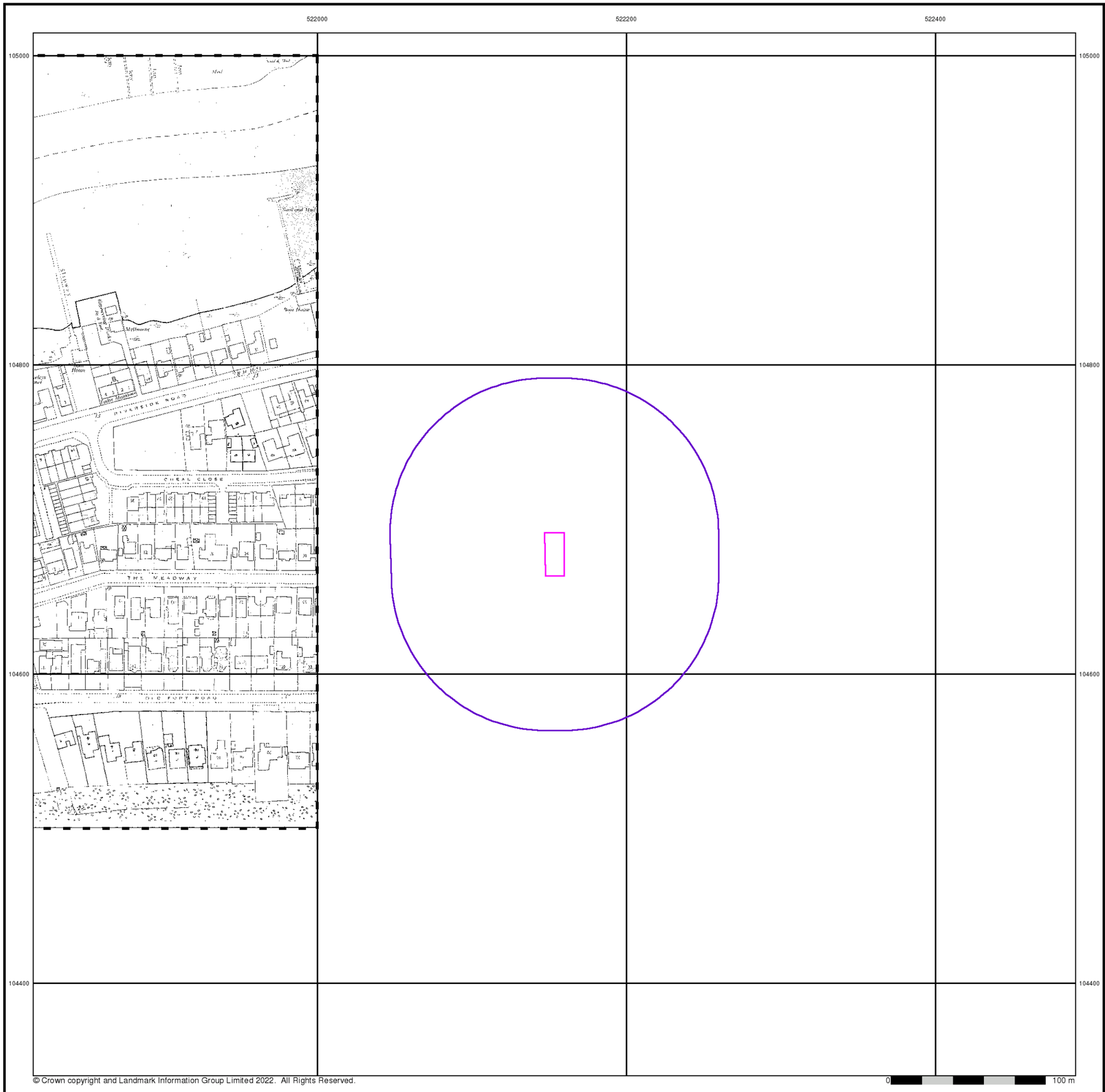

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Land Science

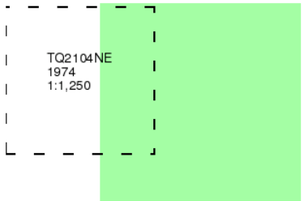
Supply of Unpublished Survey Information

Published 1974

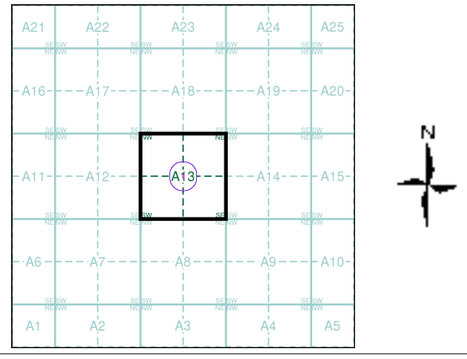
Source map scale - 1:1,250

SUSI maps (Supply of Unpublished Survey Information) were produced between 1972 and 1977, mainly for internal use at Ordnance Survey. These were more of a `work-in-progress' plan as they showed updates of individual areas on a map. These maps were unpublished, and they do not represent a single moment in time. They were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
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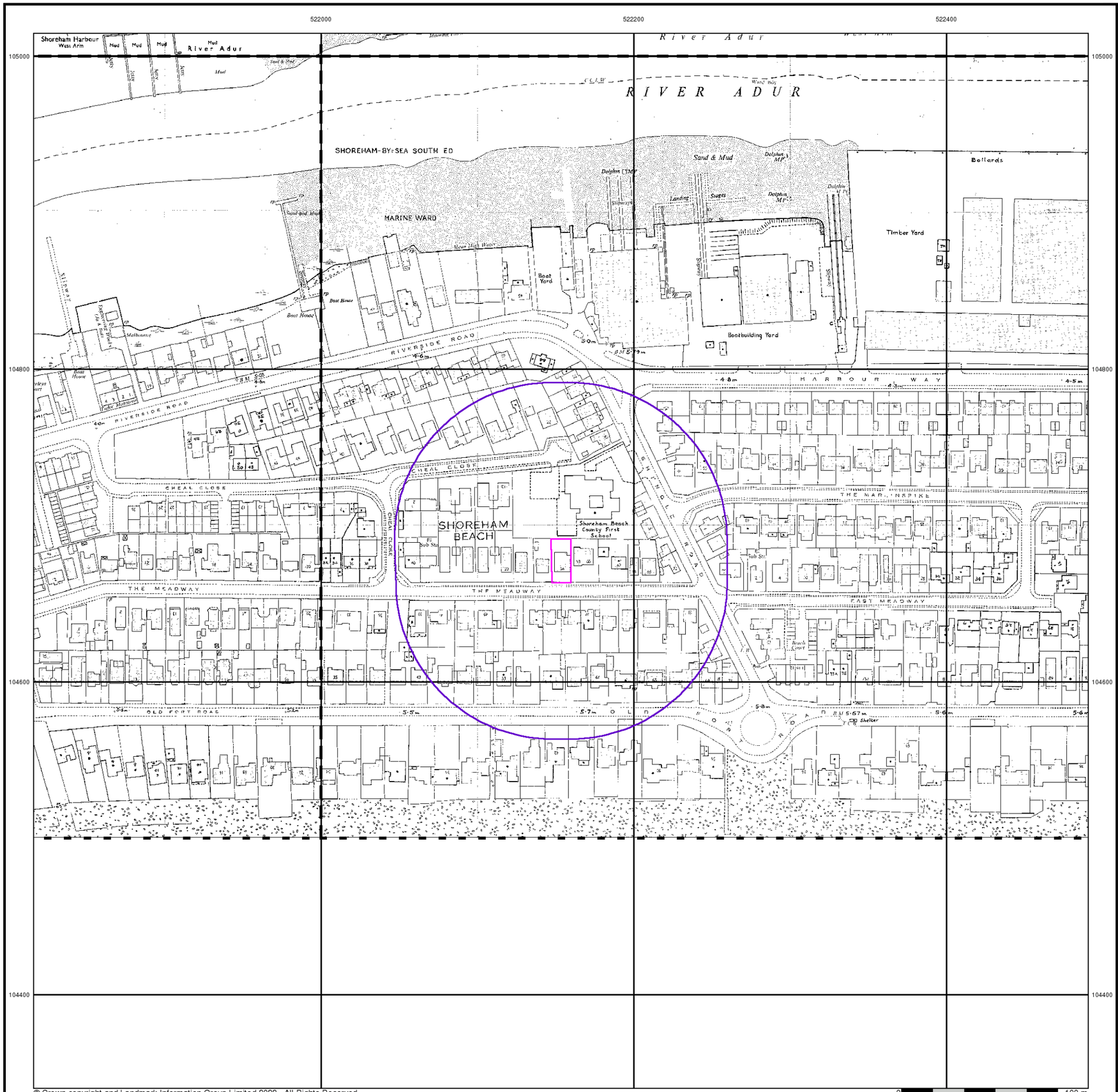


Land Science

Additional SIMs

Published 1977 - 1980

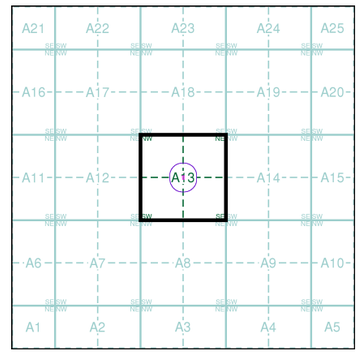
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TQ2105SE 1979 1:1,250	TQ2205SW 1980 1:1,250
TQ2104NE 1977 1:1,250	TQ2204NW 1979 1:1,250

Historical Map - Segment A13



Order Details

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Slice:	A
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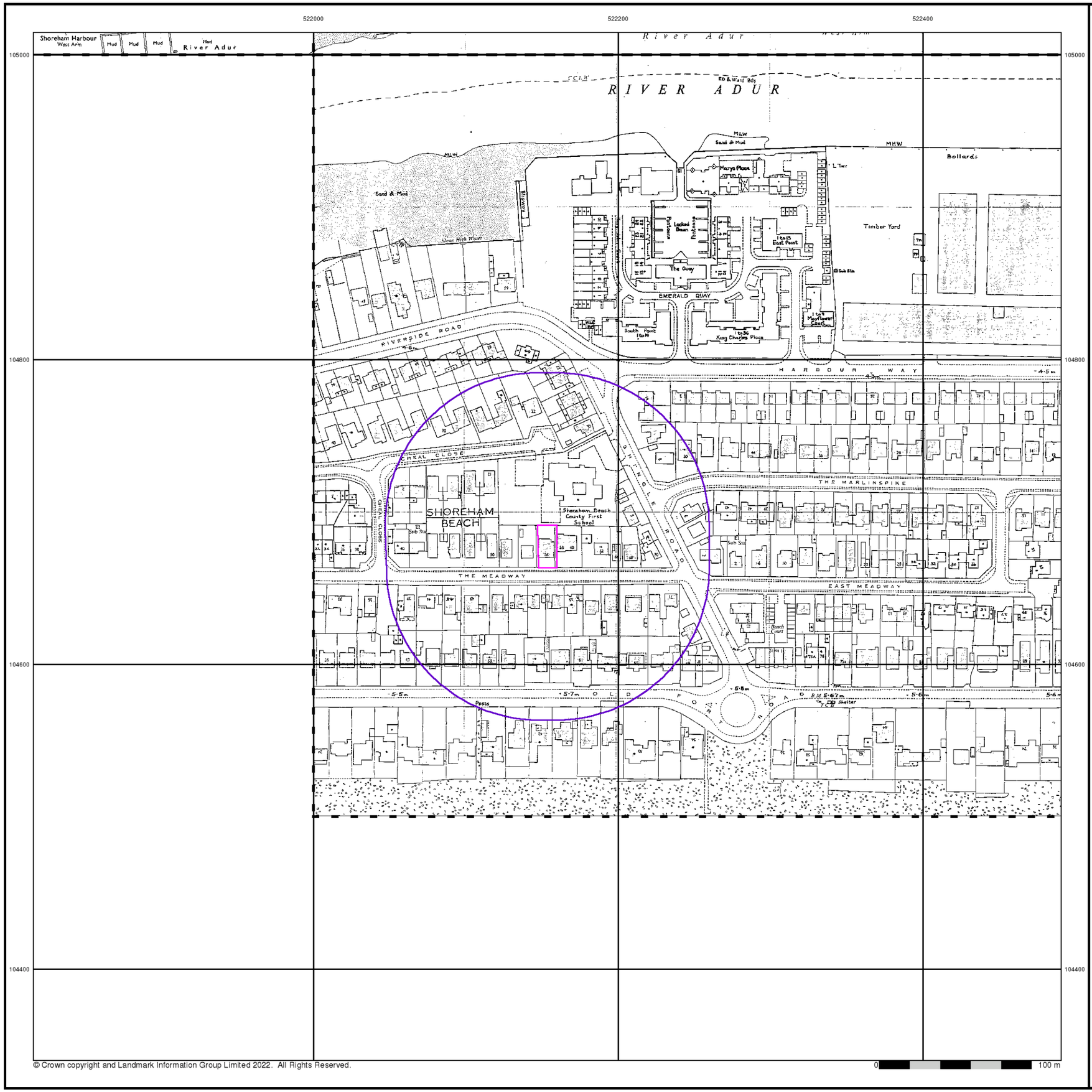


Land Science

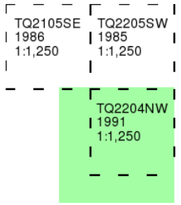
Additional SIMs

Published 1985 - 1991

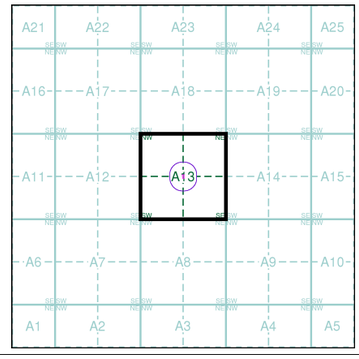
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

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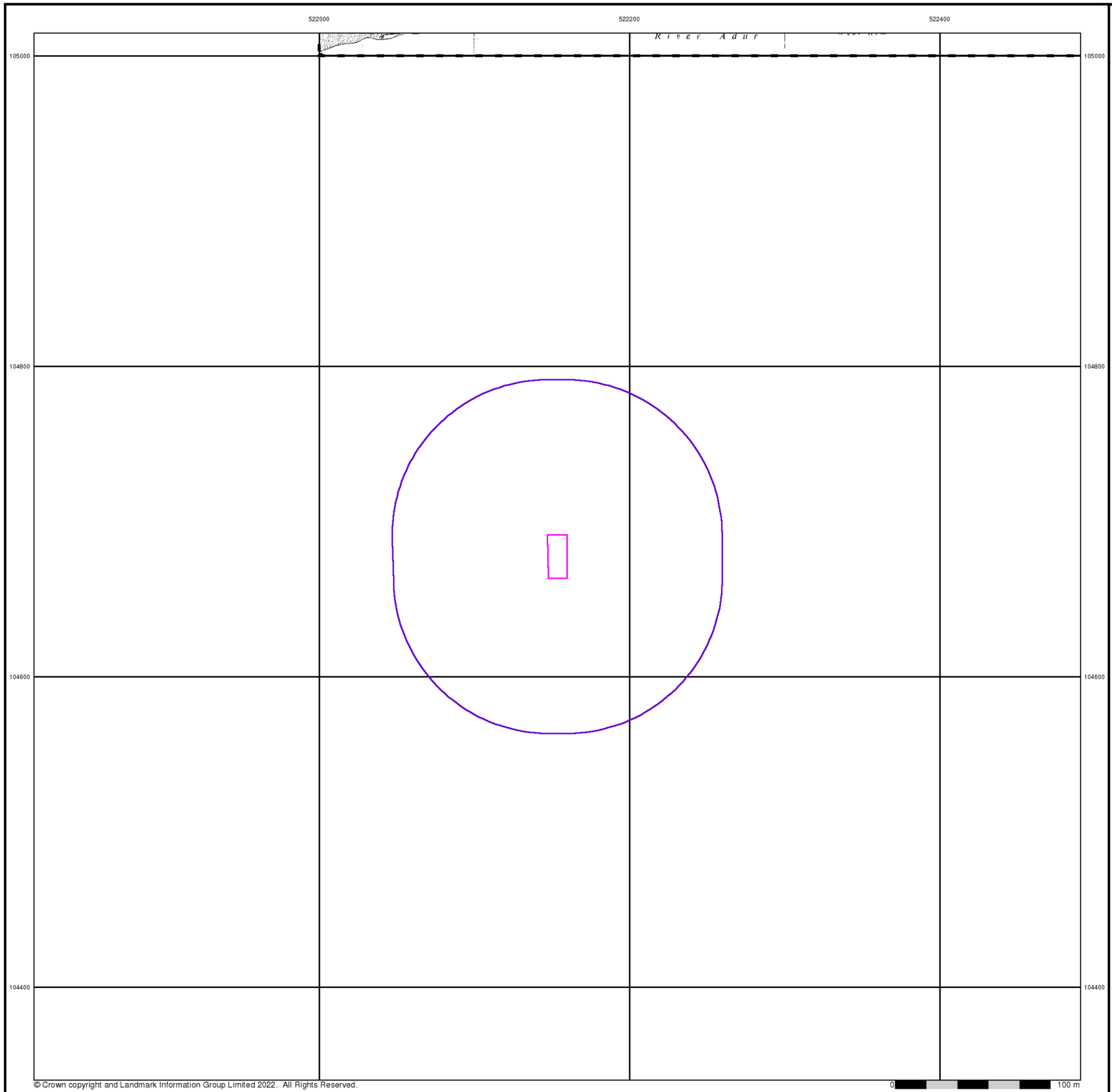

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Land Science

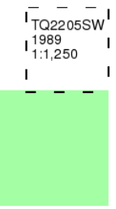
Additional SIMs

Published 1989

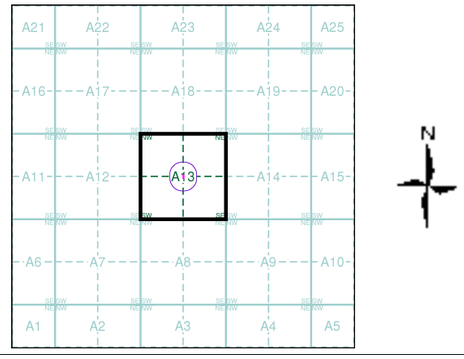
Source map scale - 1:1,250

The SIM cards (Ordnance Survey's `Survey of Information on Microfilm') are further, minor editions of mapping which were produced and published in between the main editions as an area was updated. They date from 1947 to 1994, and contain detailed information on buildings, roads and land-use. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)



Historical Map - Segment A13



Order Details

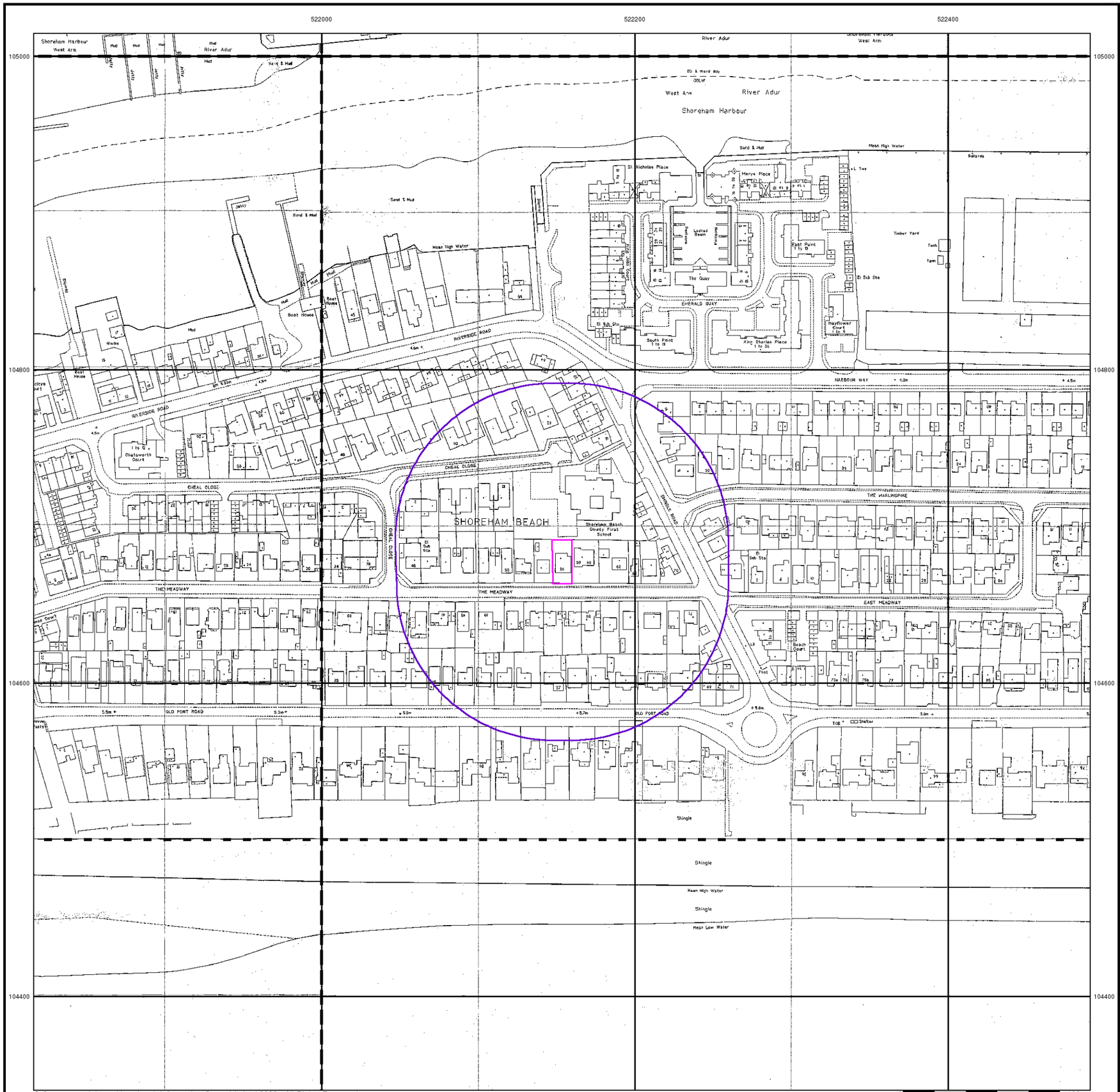
Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

56, The Meadway, SHOREHAM-BY-SEA, BN43 5RP

Landmark INFORMATION GROUP

Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



Land Science

Large-Scale National Grid Data

Published 1994

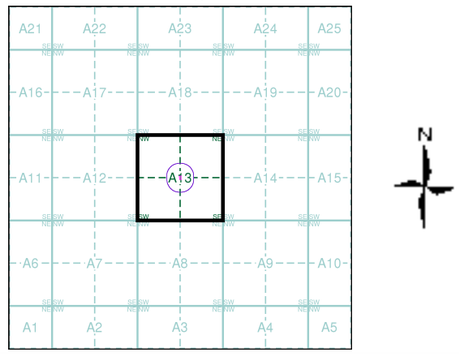
Source map scale - 1:1,250

'Large Scale National Grid Data' superseded SIM cards (Ordnance Survey's 'Survey of Information on Microfilm') in 1992, and continued to be produced until 1999. These maps were the fore-runners of digital mapping and so provide detailed information on houses and roads, but tend to show less topographic features such as vegetation. These maps were produced at both 1:2,500 and 1:1,250 scales.

Map Name(s) and Date(s)

TQ2105SE 1994 1:1,250	TQ2205SW 1994 1:1,250
TQ2104NE 1994 1:1,250	TQ2204NW 1994 1:1,250
TQ2104SE 1994 1:1,250	TQ2204SW 1994 1:1,250

Historical Map - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

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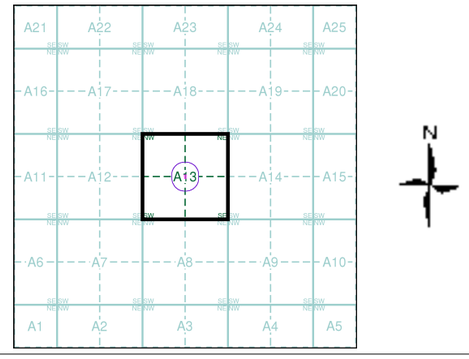
Historical Aerial Photography

Published 1999

This aerial photography was produced by Getmapping, these vertical aerial photographs provide a seamless, full colour survey of the whole of Great Britain

Historical Aerial Photography - Segment A13



Order Details

Order Number:	304309503_1_1
Customer Ref:	LS6595
National Grid Reference:	522150, 104680
Slice:	A
Site Area (Ha):	0.04
Search Buffer (m):	100

Site Details

56, The Meadway, SHOREHAM-BY-SEA, BN43 5RP

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APPENDIX G

Report of address search for radon risk

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Address searched: 56 The Meadway, Shoreham-by-Sea, BN43 5RP
Date of report: 24 November 2022

Guidance for existing properties

Is this property in a radon Affected Area? - Yes

A radon Affected Area is defined as where the radon level in at least one property in every hundred is estimated to exceed the Action Level.

The estimated probability of the property being above the Action Level for radon is: 1-3%

The probability result is only valid for properties above ground. All basement and cellar areas are considered to be at additional risk from high radon levels.
The result may not be valid for buildings larger than 25 metres.
If this site if for redevelopment, you should undertake a GeoReport provided by the British Geological Survey.

This report informs you of the estimated probability that this particular property is above the Action Level for radon. This does not necessarily mean there is a radon problem in the property; the only way to find out whether it is above or below the Action Level is to carry out a radon measurement in an existing property.

Radon Affected Areas are designated by the UK Health Security Agency. UKHSA advises that radon gas should be measured in all properties within Radon Affected Areas.

If you are buying a currently occupied property in a Radon Affected Area, you should ask the present owner whether radon levels have been measured in the property. If they have, ask whether the results were above the Radon Action Level and if so, whether remedial measures were installed, radon levels were re-tested, and the results of re-testing confirmed the effectiveness of the measures.

Further information is available from UKHSA or https://www.ukradon.org

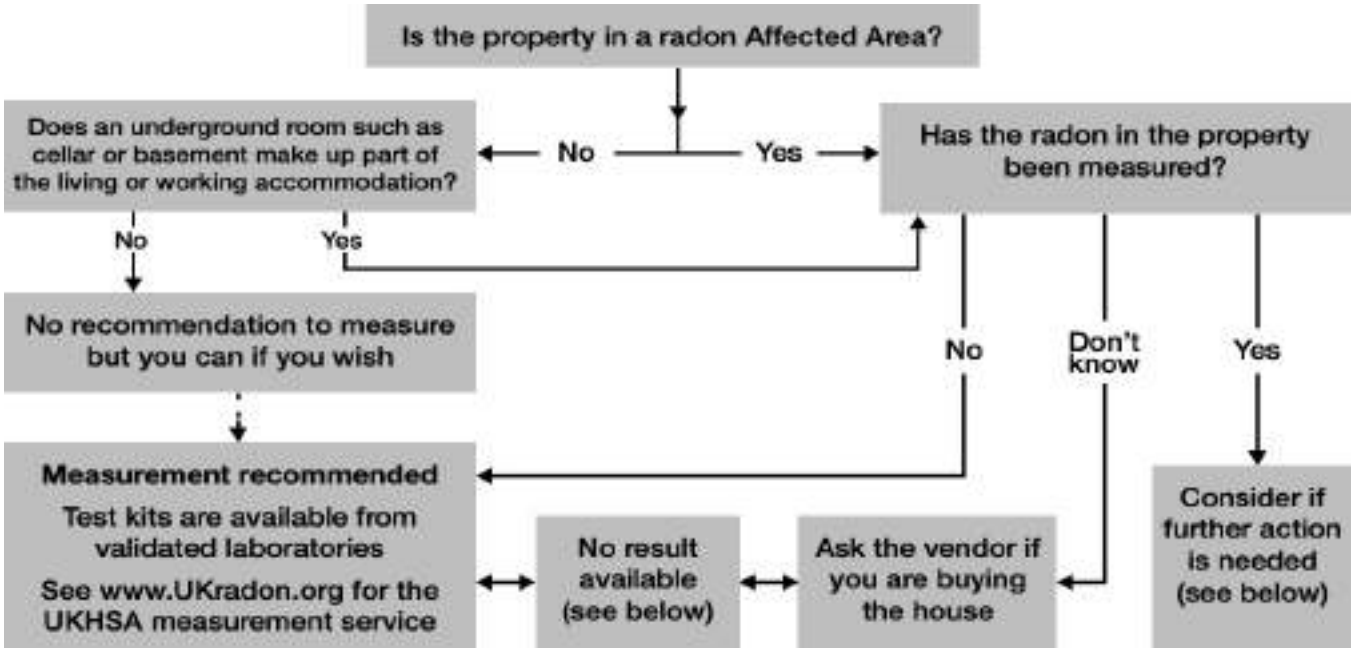
Guidance for new buildings and extensions to existing properties

What is the requirement under Building Regulations for radon protection in new buildings and extensions at the property location? - None

If you are buying a new property in a Radon Affected Area, you should ask the builder whether radon protective measures were incorporated in the construction of the property.

See the Radon and Building Regulations for more details.

UKHSA guidance for occupiers and prospective purchases



Existing radon test results: There is no public record of individual radon measurements. Results of previous tests can only be obtained from the seller. Radon levels can be significantly affected by changes to the building or its use, particularly by alterations to the heating and ventilation which can also be affected by changes in occupier. If in doubt, test again for reassurance.

Radon Bond: This is simply a retained fund, the terms of which are negotiated between the purchaser and the vendor. It allows the conveyance of the property to proceed without undue delay. The purchaser is protected against the possible cost of radon reduction work and the seller does not lose sale proceeds if the result is low. Make sure the agreement allows enough time to complete the test, get the result and arrange the work if needed.

High Results: Exposure to high levels of radon increases the risk of developing lung cancer. If a test in a home gives a result at or above the Action Level of 200 Becquerels per cubic metre of air (Bq/m3), formal advice will be given to lower the level. Radon reduction will also be recommended if the occupants include smokers or ex-smokers when the radon level is at or above the Target Level of 100 Bq/m3; these groups have a higher risk. Information on health risks and radon reduction work is available from UKHSA. Guidance about radon reduction work is also available from some Local Authorities, the Building Research Establishment and specialist contractors.

UKHSA designated radon website: https://www.ukradon.org
Building Research Establishment: http://www.bre.co.uk/page.jsp?id=3137

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