Ruddlesden geotechnical ltd

Geotechnical Investigation and Contamination Assessment Report

Park Farm, Gillingham, Dorset

C.G. Fry & Son Ltd

March 2010

SR/SB/DT/09157/GICAR

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EXECUTIVE SUMMARY

It is proposed to develop land at Park Farm, Gillingham, Dorset, for residential purposes. Old maps showed the site has remained undeveloped from first edition maps (1887) until the present day, comprising open land since this time. The general field structure has remained largely the same throughout this period.

Nineteen trial pits typically encountered ground conditions of topsoil and/ or made ground, underlain by firm to stiff orangey-brown silty clay, underlain by bluish grey silty clay (occasionally with sand and gravel).

Foundation recommendations are traditional strip or trench-fill foundations at a minimum depth of 1.00m below existing or proposed ground levels, whichever is deepest, with deepening where building near trees in accordance with NHBC Standards for soils of high volume change potential.

A CBR value of 2% has been obtained from in-situ testing and this value may be used for road pavement design.

In-situ soakaway testing showed that the ground has a particularly low permeability and is not favourable for the adoption of soakaway drainage.

The contamination risk assessment indicates that the recorded levels of contamination do not pose a significant possibility of significant harm to human health or controlled waters and so no specific remedial measures are required for the proposed end-use.

No radon or ground gas protective measures are required.

As the trial pits were widely spaced to provide an initial understanding of the ground conditions only, more intensive trial pitting and testing is recommended prior to construction to confirm the above recommendations. In particular, the presence or absence of soft spots and the volume change potential should be determined in each area of the site.

1.0 INTRODUCTION

1.1 General

In January 2010, a combined Phase 1 and Phase 2: Geotechnical Investigation and Contamination Assessment was undertaken by Ruddlesden geotechnical ltd on behalf of C.G. Fry & Son Ltd, for the proposed residential development of land at Park Farm, Gillingham, Dorset.

The investigation was undertaken to determine subsurface ground conditions, to provide recommendations for foundations and associated structures, and to assess the extent of any contamination at the site.

The investigation comprised a desk study and walkover survey followed by the formation of nineteen trial pits with in-situ and laboratory testing.

1.2 Scope of Investigation

This investigation is intended to provide an overview of the ground conditions at the site and covers geotechnical and contamination aspects relating to the development. The brief was understood to comprise the following:

- Carry out a desk study and walkover survey.
- Undertake exploratory holes.
- Schedule geotechnical and contamination laboratory testing.
- Establish the ground conditions across the site.
- Make recommendations for foundation design.
- Carry out in-situ soakaway testing and provide recommendations for soakaway design.
- Make recommendations covering other geotechnical aspects, including roads, excavations and groundwater.
- Undertake a contamination risk assessment.
- Provide details of any contamination remedial measure requirements.

1.3 Scope of Report

The report is presented as a description of the procedures employed and the data obtained. This is followed by a thorough description of the ground and groundwater conditions, together with an assessment of material and mass ground parameters. The final part of the report comprises analysis, recommendations, and conclusions, which are provided in two separate parts: geotechnical and contamination.

2.0 THE SITE

2.1 Site Location

The site is located at Park Farm, Gillingham, Dorset, see Appendix E (Dwg. No. 09157/01). The British National Grid Reference of the site is 382320, 125930.

The site is located within a residential/ rural area to the southeast of the town of Gillingham. The surrounding topography is very gently undulating.

Access is gained via Carne Avenue and a padlocked set of gates in the west of the site or via Park Farm in the south.

2.2 Site Description

The site is irregular in shape, measuring approximately 930m x 700m (35Ha), and is gently undulating with an overall general gentle slope down towards the east-northeast. The ground was noted to be boggy underfoot across much of the site.

The site comprises eight grass-covered fields, divided by hedgerows and drainage ditches. Ponds are present in the north and northwest of the site, and an attenuation pond is present in the east of the site. Enclosed areas of relatively recently planted mixed deciduous trees, no taller than approximately 15m, are present in the north, east and southwest of the site. A small field, currently in use as an allotment, with hutches and pens, is present in the southwest of the site. Mixed deciduous trees, no taller than approximately 20m, typically surround the fields.

Anecdotal information from the current owner of the site indicates that the fields have largely been used for grazing and that the field in the south/ southeast of the site has recently been re-profiled with a coverage of approximately 1m deep made ground (clay subsoil).

The site is bordered to the north by a brook (Fern Brook) before fields, to the east by a stream before fields, to the south by a working farm (Park Farm) and to the west by a housing estate, a business park (Kingsmead Business Park) and an electricity housing substation.

Photographs of the site are presented in Appendix B.

3.0 DESK STUDY

3.1 General

A desk study was undertaken to provide background information, comprising the consultation of:

- Old Ordnance Survey maps.
- Geological maps and memoirs.
- Environmental information.

This information was used to produce a “conceptual model” of the site so that an appropriate intrusive investigation could be carried out.

3.2 Site History

A full set of old Ordnance Survey maps of the site was obtained as part of the *Landmark Envirocheck* report (Appendix D of this report). The salient points are described below.

In summary, the old Ordnance Survey maps showed that the site has remained undeveloped from first edition maps (1887) until the present day, comprising open land since this time. The general field structure has remained largely the same throughout this period.

3.3 Site Geology

The British Geological Survey (BGS) map of the area shows the site to be underlain by Jurassic Kimmeridge Clay Formation, overlain by Quaternary Head deposits in the north of the site.

The BGS regional guide describes the Kimmeridge Clay Formation as “Mudstones; thin siltstone and cementstone beds; locally sands and silts”. The Head deposits are described as “silty to sandy clay with angular clasts of local rock fragments up to boulder size”.

3.4 Environmental Information

The key environmental information contained within the *Landmark Envirocheck* Report is listed below:

- The nearest surface water feature is located on site, comprising a pond in the northwestern part of the site and an attenuation pond and stream (Fern Brook) in the eastern part of the site.
- There are no known abstraction points within 250m of the site.
- The underlying strata are classified as a Non Aquifer in the southwest and a Minor Aquifer in the north and east. Non Aquifers are generally regarded as containing insignificant quantities of groundwater. However, groundwater flow through such rocks, although imperceptible, does take place and needs to be considered in assessing the risk associated with persistent pollutants. Minor Aquifers can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers.
- There are no recorded landfill sites within 250m of the site.
- The British Geological Survey (BGS) information indicates that between 1% and 3% of homes are above the Radon Action Level but that no radon protective measures are necessary in the construction of new dwellings.

3.5 Initial Conceptual Model

3.5.1 Geotechnical Conceptual Model

From the historical data, the site has not had an industrial past-use. However, anecdotal evidence and discussions with the current land owner suggest that part of the site has been re-profiled and so some made ground would be expected in parts of the site.

From the published information, the expected underlying geology is Kimmeridge Clay Formation, possibly overlain by Quaternary Head deposits in the north of the site. The Kimmeridge Clay deposits should provide sufficient bearing capacity for the adoption of traditional strip or trench-fill foundations, though the Head deposits may be too weak.

3.5.2 Contamination Conceptual Model

Source

Old maps showed that the site has comprised a series of fields since 1887. Although such a land-use is unlikely to have caused any significant contamination of the ground, some made ground may be present and this may be generically contaminated.

Located in a predominantly rural area, and based on desk study information, it is considered that past and present surrounding land uses are unlikely to have caused any significant contamination of the ground beneath the site.

Pathway

In accordance with the CLEA model for a residential land use, exposure pathways potentially linking contamination to humans include:

- Direct soil and indoor dust ingestion.
- Consumption of homegrown produce.
- Consumption of soil adhering to homegrown produce.
- Skin contact with soils and indoor dust.
- Inhalation of indoor and outdoor dust and vapours.

If present, groundwater flow is considered to be the main migration pathway linking any contamination to controlled waters receptors.

Receptor

As a residential land use, end-users are considered as potential receptors of any contamination, with a young female child (aged zero to six years old), being the critical receptor.

The nearest water course, located on site, and groundwater beneath the site are considered to be the main potential controlled waters receptors.

3.6 Sampling and Analysis Plan

In order to confirm the above conceptual models, an intrusive site investigation was undertaken.

The purpose of this investigation is to identify any areas of the site where abnormal subsurface costs might exist, e.g. contamination, piled foundations etc. Additional, more intensive, investigation work is likely to be required in the future. Nevertheless, it is intended that this investigation will provide parameters to enable initial foundation, road and drainage design to be carried out for costing purposes and identify any probable contamination remediation costs.

Trial pits were considered to be the most suitable exploratory technique, as these would enable a large volume of the ground to be inspected and tested in-situ. The trial pits were located so as to provide a reasonable spread of information and an accurate representation of subsurface ground conditions.

In-situ Dynamic Cone Penetrometer (DCP) testing was undertaken to provide an indication of California Bearing Ratio (CBR) value for use in road pavement design.

In-situ soakaway testing was undertaken to assess the permeability and suitability of the ground for soakaway drainage.

Geotechnical laboratory tests were undertaken to determine the volume change potential of the soil for foundation design and pH and sulphate testing to determine concrete class requirements. Samples were taken for geotechnical testing from seventeen different locations, at different depths.

Representative samples were tested for the former ICRCL suite of contaminants, speciated PAH and total TPH, which provides a broad and general suite of contaminants that may be present. Samples were selected for contamination testing from eighteen of the trial pits from a range of depths within the near surface deposits, as, in accordance with the CLEA model, contamination is assumed to be within the near surface deposits for most exposure pathways.

Samples were selected for testing to provide an accurate representation of ground conditions encountered.

4.0 FIELDWORK

4.1 General

All fieldwork was undertaken on 25 and 26 January 2010. The siting and setting out of all the trial pits was the responsibility of Ruddlesden geotechnical ltd, who also determined the extent of testing and sampling.

The number of trial pits was limited to minimise disturbance to the farmer's fields, but were sufficient to broadly understand the ground conditions.

All fieldwork was undertaken in accordance with BS5930 (1999): British Standard Code of Practice for Site Investigation, British Standard BS10175 (2001): Investigation of Potentially Contaminated Sites – Code of Practice and Eurocode 7 (2007): Part 2 Ground Investigation and Testing.

4.2 Trial Pits

Nineteen trial pits were excavated to depths of between 2.60m and 3.00m using a JCB 8080 (eight tonne tracked excavator).

Samples and observations were made from inside the pit to a depth of 1.20m, where safe to do so, from the surface and from samples recovered from the excavator bucket. The supervising geologist provided a detailed description of the ground conditions, groundwater and stability and also obtained samples at representative locations, which were placed into suitable containers. The trial pits were not shored.

In-situ shear vane testing was undertaken in suitable soils to obtain an estimate of undrained shear strength.

Details of ground and groundwater conditions encountered can be found on the trial pit logs (Appendix A) and photographs (Appendix B). The trial pit locations are shown on the exploratory hole location plan (Dwg. No. 09157/02, Appendix E).

4.3 Soakaway Testing

Three soakaway tests were undertaken in general accordance with BRE 365 “Soakaway Design”.

The trial pit was excavated to a depth deemed sufficient to represent a section of the design soakaway. The vertical sides were trimmed square. A 1500-gallon water bowser was used to supply the large volumes of water required at a quick rate.

The pit was filled with water and allowed to drain. The fall in water level was recorded with time.

4.4 In-Situ CBR (TRL DCP Method) Testing

In-situ Dynamic Cone Penetrometer (DCP) Testing was undertaken at eight locations across the site, as shown on the exploratory hole location plan (Dwg. No. 09157/02, Appendix E).

The Transport Research Laboratory (TRL) DCP uses an 8kg hammer dropping through a height of 575mm and a 60° cone having a maximum diameter of 20mm. The penetration and number of blows are recorded up to a maximum depth of 1.00m BGL. The penetration rate is recorded as the cone is driven into the subgrade and is used to calculate the strength of the material (CBR value) through which the cone is passing. A change in penetration rate indicates a change in strength between materials, thus allowing layers to be identified and the thickness and strength of each to be determined.

5.0 LABORATORY TESTING

5.1 General

All laboratory testing was scheduled by Ruddlesden geotechnical ltd and the results are presented in Appendix C of this report.

5.2 Geotechnical Testing

The programme of laboratory testing was carried out in accordance with BS 1377 (1990) “Methods of Test for Soils for Civil Engineering Purposes”.

The following tests were carried out on seventeen samples:

- Moisture Content
- Plasticity Tests
- Particle Size Distribution
- pH Value
- Sulphate Content

5.3 Contamination Testing

In order to test the conceptual model of the site (see section 3.5.2 of this report), eighteen soil samples were tested for the following suites of tests; the testing was UKAS accredited:

Former ICRCL Suite

Arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, total PAH, total sulphate, soluble sulphate, pH, boron, phenols.

Speciated Polyaromatic Hydrocarbons (PAH)

Acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h) anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene.

Total Petroleum Hydrocarbons (TPH)

Total TPH.

Soil Organic Matter (SOM)

6.0 RESULTS OF THE INVESTIGATION

6.1 General

The following sections provide a summary of ground conditions encountered, groundwater and laboratory testing. Further details are provided in the Appendices of this report.

The results of this investigation broadly concur with the predicted conceptual model.

6.2 Ground Conditions Encountered

6.2.1 Topsoil

Topsoil was encountered in all of the trial pits to depths of between 0.20m and 0.40m below existing ground levels.

6.2.2 Made Ground

Made ground was encountered in TP18 and TP17 beneath the topsoil, to a depth of 1.00m and 1.20m respectively.

In TP17, the made ground was observed to comprise orangey brown silty gravelly clay, to a depth of 1.00m, underlain by soft orangey brown silty slightly gravelly clay to a depth of 1.20m. In TP18, the made ground was observed to comprise orangey brown silty slightly gravelly clay with occasional pieces of brickwork and ceramics to a depth of 1.00m

6.2.3 Natural Geology

Beneath the topsoil and/ or made ground, firm to stiff orangey-brown occasionally mottled bluish grey silty clay was typically encountered to depths of between 0.70m and 2.80m.

In TP02 and TP09, the clay was observed to be slightly gravelly at depths of 0.60m and 1.30m, respectively. In TP01, TP05 and TP08, the clay was observed to be gravelly at depths of 0.60m, 1.30m and 1.50m, respectively. In TP16, the clay was observed to be very gravelly at 0.90m.

In TP10 and TP13, this clay deposit was underlain by orangey brown or bluish grey medium dense clayey (TP10) slightly sandy gravel to a depth of 2.20m.

In all the trial pits these deposits were typically underlain by firm to stiff bluish grey, occasionally mottled orange or brown, silty clay, to the base of all the trial pits (up to 3.00m).

In TP01, this deposit was recorded as being slightly silty with occasional pockets of gravel. Frequent pieces of shell material were also observed in both TP01 and TP05.

In TP03 and TP07, it was intersected by a layer of medium dense bluish grey slightly clayey silty (TP03) gravelly sand at depths of between 2.00m to 2.40m and 2.30m to 2.70m, respectively.

In TP04, TP06, TP09, TP11 and TP18, the clay was observed to become sandy and/ or gravelly at depths of 2.40m, 2.80m, 1.90m, 2.70m and 2.30m respectively.

Estimates of undrained shear strength obtained from in-situ shear vane testing at a depth of 1.00m typically ranged from 70kN/m^2 to 130kN/m^2, indicating the ground to be firm to stiff. At one location (TP03) a shear

strength value of 40kN/m^2 was recorded, indicating the ground in this location to be soft to firm, at this depth.

The density of the granular deposits was estimated from a visual assessment only, i.e. ease of excavation and stability of trial pit sides.

6.3 Groundwater

Groundwater was encountered at the following depths during the course of the investigation:

Table One: Occurrence of Groundwater During Excavation (25/01/10)

BH No.	Water Level (mBGL)	Rate of Inflow
TP03	2.20	Slight
TP04	2.50	Slight
TP07	2.70	Slight

6.4 Soakaway Testing

Full details of the soakaway testing results are provided in Appendix A of this report and are summarised in the table below:

Table Two: Summary of Soakaway Test Results

Test No.	Total Recorded Fall of Water Level (m)	Duration of Test (minutes)	Soil Infiltration Rate (m/s)
TP02	-0.02	420	* N/A
TP09	-0.33	372	* N/A
TP15	-0.01	308	* N/A

* Rise in water level recorded. No calculation of soil infiltration rate possible. Tests are deemed to have failed.

6.5 In-Situ CBR Testing (TRL DCP Method)

The results of the in-situ dynamic cone penetrometer (DCP) testing are presented in Appendix A of this report.

From the DCP testing, CBR values ranging from 2% to 43% have been obtained.

6.6 Geotechnical Laboratory Testing

All the geotechnical laboratory testing results are presented in Appendix C of this report and are summarised in the table below:

Table Three: Summary of Geotechnical Laboratory Testing Results

	TP01 1.00m	TP03 3.00m	TP04 2.50m	TP05 1.00m	TP06 2.00m	TP07 1.50m	TP08 2.00m	TP10 1.00m	TP11 2.00m
Moisture Content (%)	27.7	35.6	24.4	22.8	27.6	26.6	24.4	12.6	25.4
Liquid Limit (%)	62	74	-	52	49	51	58	-	53
Plastic Limit (%)	23	27	-	19	18	18	23	-	19
Plasticity Index (%)	39	47	-	33	31	33	35	-	34
%passing 425µm sieve	100	100	43	100	100	100	100	32	100
Modified Plasticity Index (%)	39	47	-	33	31	33	35	-	34
Volume Change Potential	Medium	High	Non-shrinkable	Medium	Medium	Medium	Medium	Non-shrinkable	Medium
pH Value	7.6	6.4	7.8	7.6	7.9	8.1	7.8	8.0	8.0
Sulphate Content (g/l)	0.08	0.01	0.02	0.01	0.01	0.01	0.01	0.07	0.01

	TP12 1.50m	TP13 2.00m	TP14 1.50m	TP15 1.00m	TP16 1.25m	TP17 2.50m	TP18 1.00m	TP19 1.00m
Moisture Content (%)	29	21.2	22.7	28.2	21	27.5	19.6	25.7
Liquid Limit (%)	49	-	63	65	-	60	74	57
Plastic Limit (%)	17	-	19	21	-	21	25	21
Plasticity Index (%)	32	-	44	44	-	39	49	36
%passing 425µm sieve	100	27	100	100	51	100	100	100
Modified Plasticity Index (%)	32	-	44	44	-	39	49	36
Volume Change Potential	Medium	Non-shrinkable	High	High	Non-shrinkable	Medium	High	Medium
pH Value	8.0	7.9	5.6	8.0	7.8	8.0	7.9	8.2
Sulphate Content (g/l)	0.24	0.03	0.01	0.1	0.03	0.22	0.13	0.05

6.7 Contamination Laboratory Testing

All the laboratory testing results, together with the Generic Assessment Criteria to which they have been compared, are presented in Appendix C of this report and the implications are discussed in section 8 of this report.

In summary, no significantly elevated levels of contamination were recorded in any of the eighteen samples tested.

7.0 GEOTECHNICAL ASSESSMENT

7.1 Proposals

It is understood that the site is to be developed for residential purposes with the construction of several houses with associated infrastructure. No further details were available at the time of writing this report.

7.2 Ground Profile

The ground conditions encountered have been summarised in section 6.0 of this report and the individual trial pit logs, photographs and laboratory testing results should be referred to for further details. Within this section of the report the general ground profile is reviewed and the engineering significance of individual layers is discussed.

Beneath a surface covering of topsoil and/ or made ground, firm to stiff orangey-brown becoming bluish grey silty clay (occasionally with varying proportions of sand and gravel) was typically encountered.

Laboratory testing revealed the clay to be of medium to high volume change potential in accordance with NHBC Standards, chapter 4.2. In the absence of intensive testing, high volume change potential soils should be assumed.

Estimates of undrained shear strength obtained from in-situ shear vane testing at a depth of 1.00m typically ranged from 70kN/m^2 to 130kN/m^2, indicating the ground to generally have sufficient bearing capacity to provide a suitable founding stratum for strip or trench-fill foundations.

However, as an exception, at one location (TP03) a shear strength value of 40kN/m^2 was recorded, indicating the foundations in this area would require deepening or reinforcing. This might also indicate that other similar areas are present elsewhere across the site.

7.3 Foundations

7.3.1 General

The results of this investigation indicate that strip or trench-fill foundations are generally suitable to support the proposed structures.

However, prior to development, further, more intensive, testing should be carried out to confirm that ground of sufficient bearing capacity is present and to confirm the volume change potential.

7.3.2 Strip or Trench-Fill Foundations

It is considered that a safe nett allowable bearing pressure of 150kN/m^2 may be placed on the firm to stiff clay by strip or trench-fill foundations of least width 600mm at a minimum depth of 1.00m below existing or proposed ground levels, whichever is deepest.

Where building near trees, foundations should be deepened in accordance with NHBC Standards, chapter 4.2, for soils of high volume change potential. However, more intensive testing might prove high volume change potential soils to locally be absent. Foundations may, therefore, in some areas of the site, be able to be deepened for soils of medium volume change potential.

Where foundations are stepped to take account of the influence of trees they should be stepped gradually with no step exceeding 0.50m.

Heave precautions are required to protect the foundations from lateral soil heave movements where the foundation is within the influence of trees and where the foundation depth is greater than 1.50m due to NHBC requirements where building near trees. Suitable heave precautions for trench-fill foundations would be compressible material against the inside faces of all external wall foundations.

It should be endeavoured to build foundations on like material. Where this is not possible, the boundary between the changes in strata, e.g. clay/ gravel, should be suitably reinforced.

Foundations must also be built at least 0.20m below any made ground.

Any soft or loose material in the base of foundation excavations should be removed and replaced with compacted lean mix concrete prior to pouring the foundations.

7.3.3 Ground Floor Slabs

Where more than 600mm of made ground is present, where the slope of the ground means that more than 600mm of fill is required beneath floor slabs or where NHBC building near trees requirements mean that foundation depths are greater than 1.50m, fully suspended ground floor slabs are required.

Where less than 600mm of made is present, where the slope of the ground means that less than 600mm of fill is required beneath floor slabs and where NHBC building near trees requirements mean that foundation depths are less than 1.50m, ground bearing slabs may be adopted.

As the soils are of medium to high volume change potential, suspended ground floor slabs should be used where ground floor construction is undertaken when soils are seasonally desiccated (i.e. during summer months and autumn).

7.3.4 Sulphate and pH Aggressivity

The results of the pH and sulphate tests have been compared to Table C1 of BRE Special Digest 1 “Concrete in Aggressive Ground”. This comparison indicates the Design Sulphate Class for the site to be DS- 1. As the site is considered to be greenfield, groundwater can be treated as static and pH values greater than 2.5 were recorded, Aggressive Chemical Environment for

Concrete (ACEC) class AC- 1s is required for all buried concrete at this site, i.e. no special precautions.

7.3.5 Radon Protective Measures

BR Report 211 “Radon: Guidance on Protective Measures for New Dwellings” and British Geological Survey (BGS) information obtained as part of the *Landmark Envirocheck* report (Appendix D) indicate that no radon protection measures are required.

7.4 Groundwater and Excavations

Slight groundwater seepage was encountered in TP03, TP04 and TP07 at depths of between 2.20m and 2.70m. No groundwater was encountered in any of the other trial pits. Some de-watering of deep excavations is therefore likely to be required.

It is noted that groundwater levels fluctuate according to the season and from year to year. It is noted that in the weeks prior to the investigation the weather had been wet for the time of year. Therefore, lower groundwater levels may be encountered during the drier summer months. Likewise though, higher groundwater levels may be encountered during periods of wetter weather.

All trial pits were generally stable and so only limited shoring of temporary excavations should be necessary.

No problems with excavatability are foreseen.

7.5 Roads

In-situ CBR (TRL DCP Method) testing produced CBR values ranging from 2% to 43%.

The TRL DCP can sometimes produce artificially high CBR values. It is therefore recommended the lower CBR value of 2% be used for road pavement design at this site.

This should be confirmed prior to construction with full-scale in-situ CBR tests at road level in accordance with BS1377 and to the satisfaction of the adopting authority.

Laboratory testing indicated the soils to be frost-susceptible.

7.6 Soakaways

Three in-situ soakaway tests were undertaken in accordance with BRE 365.

Water level rises of 0.01m, 0.02m and 0.33m were recorded over the course of the day.

These results indicate that the ground has a very low permeability and is not suitable for the adoption of soakaway drainage.

The preferable drainage solution at this site would be to discharge into the sewer. If necessary, an underground storage tank with a throttled outflow valve may be able to be installed to allow water to be discharged into the sewer at an agreed rate with the local water authority so that during storm periods discharge into the sewer is not increased from the present situation.

The use of Attenuation Cells, (also known as Storm Cells, Soakaway Modules, and Storm Crates) might be appropriate at this site. These are specially manufactured, modular cells usually made from recycled

polypropylene that are light in weight. Being modular, many units can be linked together, in three planes, to give whatever capacity is required.

Surface water run-off volumes may also be reduced by the adoption of permeable paving and/ or the adoption of rainwater harvesting/ recycling techniques.

7.7 Further Work

The spacing of the trial pits was necessarily relatively far apart, to minimise disturbance to the farmer's fields, but at the same time were sufficiently close together to enable subsurface ground conditions to be relatively well understood so that preliminary subsurface costs (foundations, drainage, road design, contamination etc) could be ascertained.

Prior to development, more intensive trial pitting and testing is recommended to confirm the findings of this report. In particular, slightly softer ground was encountered in TP03; the precise extent of this is currently unknown and similar soft areas might exist elsewhere across the site. Also, laboratory testing classified most of the soils as either high or medium volume change potential. In the absence of further testing, foundations must be designed in accordance with NHBC Standards, Chapter 4.2 for high volume change potential soils; intensive testing might prove that some areas can be classified as medium volume change potential, allowing foundation depths and heave protection measures to be reduced.

8.0 CONTAMINATION ASSESSMENT

8.1 General

It is understood that the site investigated is to be developed for residential purposes with houses and flats, with private and communal gardens and parking areas. No further details were available at the time of writing this report.

The contamination assessment has been carried out in accordance with the latest Environment Agency guidance using a source-pathway-receptor analysis method, so that appropriate remedial measures may be proposed.

8.2 Human Health Risk Assessment

8.2.1 Generic Assessment Criteria

A Generic Qualitative Risk Assessment (GQRA) has been undertaken to assess the level of risk posed to human health by soil contamination.

The results of the contamination laboratory testing have been compared to Generic Assessment Criteria (GAC) to aid the evaluation of the extent of contamination at the site. If any of the GAC are exceeded, this may be indicative of an unacceptable risk to the health of site-users and that further investigation and/ or remediation is required.

The proposed end-use of residential land use has been used in this risk assessment.

Where Soil Guideline Values (SGV's), published by DEFRA and derived from the Contaminated Land Exposure Assessment (CLEA) model, are available, the results of the laboratory testing have been compared against the published SGV's for the proposed end-use.

For analytes where SGV's have not yet been produced, GAC produced by Land Quality Management (LQM) and the Chartered Institute of

Environmental Health (CIEH) have been referenced. The LQM/ CIEH GAC have been derived using the DEFRA and Environment Agency CLEA UK (1.04) model, which is the same methodology as the Government's Soil Guideline Values (SGV's) and is the Environment Agency's currently recommended exposure model.

In the absence of a SGV or LQM/ CIEH GAC, for determinands that are either not particularly harmful to human health or for which toxological and physio-chemical information is particularly difficult to obtain, the Dutch or ICRCL intervention values have been used as initial screening values. A Detailed Quantitative Risk Assessment (DQRA) is undertaken if any of these initial screening values are exceeded.

For determinands that are primarily deleterious to building materials, levels provided in BRE Special Digest 1, Concrete in Aggressive Ground, are considered to be the most appropriate for comparison.

8.2.2 Comparison of Testing Results to GAC

Of the eighteen soil samples tested, the following Generic Assessment Criteria were exceeded for a residential land use:

Table Four: Contamination Testing Results Exceeding GAC

Determinand	Unit	GAC	Highest Recorded Value	Location of Highest Recorded Value	No. of values exceeding GAC	Source of GAC
Arsenic	*mg/kg*	*32*	*72*	*TP13*	*1 of 18*	*SGV*
Nickel	*mg/kg*	*130*	*180*	*TP13*	*1 of 18*	*SGV*

Although elevated levels of arsenic and nickel were recorded in TP13 (72mg/kg and 180mg/kg respectively), a statistical test (mean value test) was undertaken on all arsenic and nickel results. This statistical analysis indicates that the upper bound values (US_{95}) to be 20.48mg/kg for arsenic and 57.84mg/kg for nickel, which are less than the respective Soil Guideline

Values of 32mg/kg and 130mg/kg. Therefore, the recorded levels of arsenic and nickel are not considered to be significant.

8.3 Controlled Waters Risk Assessment

In order for land affected by contamination to cause harm, there must be a source of contamination, a receptor that can be harmed and a pathway by which the receptor can be exposed to the contamination.

As no significantly elevated levels of contamination were recorded (i.e. there is no source) and no significant groundwater was encountered (i.e. there is no pathway), it is considered that there is no significant possibility of significant harm to controlled waters.

8.4 Ground Gas Assessment

The breakdown of organic material in made ground can produce ground gas, though it may also be produced by other, natural, sources (e.g. coal, peat). The principal components of ground gas are methane (potentially explosive) and carbon dioxide (potential asphyxiant).

There are no recorded landfill sites within 250m of the site and made ground was encountered at relatively shallow depths in only two of the trial pits.

Therefore, ground gas protection measures are not considered to be required at this site.

8.5 Revised Conceptual Model

Prior to the investigation, it was considered unlikely that any significant contamination would be present.

The results of this investigation indicate no significantly elevated levels of contamination to be present at this site.

Therefore, the “source” is not present in the source-pathway-receptor chain.

8.6 Discussion and Recommendations

From the results of the contamination risk assessments, due to the absence of a contamination source, it is considered that the levels of contamination recorded in this investigation do not present a significant possibility of causing significant harm to human health or controlled waters and so no specific remedial measures are required for the proposed end-use.

However, if any unexpected discoveries are encountered during construction activities (i.e. anything substantially different from the findings of this investigation), Ruddlesden geotechnical ltd should be contacted so that appropriate recommendations may be provided.

Also, in line with general good practice, comprehensive and accurate site records should be kept, including details of where soil has been moved to or from site and tip receipts.

If contamination aspects are a planning condition, these recommendations are subject to the approval of the local authority.

8.7 Off-Site Disposal of Excavated Soils

The Waste Acceptance Criteria (WAC) testing results indicate that excavated soil is likely to be classified as Inert Waste for off-site disposal purposes.

However, this classification should be confirmed by passing these results to a licensed tip operator.

If necessary and required by the tip operator, Waste Acceptance Criteria (WAC) testing could be carried out on soil to be removed from site to confirm the classification of the soil.

9.0 CONCLUSIONS

1. The site has remained undeveloped from first edition maps (1887) until the present day, comprising open land since this time. The general field structure has remained largely the same throughout this period.

2. Ground conditions encountered were typically topsoil and/ or made ground, underlain by firm to stiff orangey-brown silt clay, underlain by bluish grey silty clay (occasionally with varying proportions of sand and gravel).

3. Strip or trench-fill foundations are recommended at a minimum depth of 1.00m below existing or proposed ground levels, whichever is deepest, with deepening where building near trees in accordance with NHBC Standards for soils of high volume change potential.

4. In-situ testing indicated that a CBR value of 2% may be used for road pavement design.

5. The results of the in-situ soakaway testing indicate that the ground has a particularly low permeability and is not favourable for the adoption of soakaway drainage.

6. The contamination risk assessment indicates that the recorded levels of contamination do not pose a significant possibility of significant harm to human health or controlled waters and so no specific remedial measures are required for the proposed end-use.

7. No radon or ground gas protective measures are required.

8. As the trial pits were widely spaced to provide an initial understanding of the ground conditions only, more intensive trial pitting and testing is recommended prior to construction to confirm the above recommendations. In particular, the presence or absence of soft spots and the volume change potential should be determined in each area of the site.

10.0 REFERENCES

- British Geological Survey (1996): England and Wales Sheet 297, Wincanton.
- British Standard BS5930 (1999): Code of Practice for Site Investigation.
- British Standard BS10175 (2001): Investigation of Potentially Contaminated Sites – Code of Practice.
- Building Research Establishment (2001): Special Digest 1: Concrete in Aggressive Ground.
- Building Research Establishment (2007): Report BR 211: Radon: Guidance on Protective Measures for New Dwellings.
- DEFRA & Environment Agency (2004): CLR 11: Model Procedures for the Management of Land Contamination.
- Environment Agency (2009): Human Health Toxological Assessment of Contaminants in Soil.
- Environment Agency (2009): Updated Technical background to the CLEA Model.
- Eurocode 7 (2007): Part 2 Ground Investigation and Testing.

11.0 TERMS AND CONDITIONS

1. This report has been prepared for the sole use of the specified client in response to an agreed brief and for the stated purpose. The recommendations used in this report should not be used for any other schemes on or adjacent to this site without further reference to this company.

2. The copyright of this report is owned by Ruddlesden geotechnical ltd. With the exception of the named client, who may copy and distribute the report to deal with matters directly relating to its commission, this report may not be reproduced, published or adapted without written consent of the company.

3. New information, improved practices and legislation may necessitate an alteration to the report in whole or in part after its submission. Therefore, with any change in circumstances, this report should be referred to Ruddlesden geotechnical ltd for reassessment and, if necessary, reappraisal.

4. The comments given in this report assume that ground conditions do not vary beyond the range revealed by the investigation. There may, however, be conditions at or adjacent to the site that have not been disclosed by the investigation and which, therefore, have not been considered in this report. Accordingly, a careful watch should be maintained during any future groundworks and the recommendations of this report reviewed as necessary.

5. Whilst confident in the findings of the report, the recommendations may not necessarily be accepted by other authorities without question. It is advisable that, where appropriate, the report be submitted to the relevant statutory authorities and approval obtained before detailed design, site works or other irrevocable action is undertaken.

6. All comments and recommendations are based on groundwater conditions encountered at the time of investigation. It should be noted that groundwater levels might fluctuate according to the season and from year to year. This may have implications on other recommendations, including foundations and excavations.

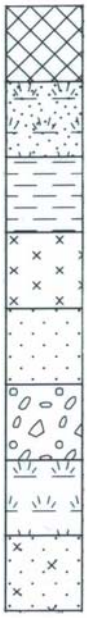
APPENDICES

APPENDIX A

EXPLORATORY HOLE RECORDS AND FIELD DATA

KEY TO TRIAL PIT AND BOREHOLE LOGS (COMMON SYMBOLS)

STRATA LEGEND



Made Ground

Topsoil

Clay

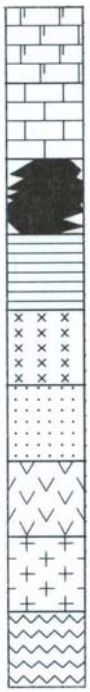
Silt

Sand

Gravel

Peat

Composite soil types will be signified by combined symbols, e.g. silty sand



Chalk

Limestone

Coal

Mudstone

Siltstone

Sandstone

Fine grained igneous rock (e.g. basalt)

Medium grained igneous rock (e.g. granite)

Fine grained metamorphic rock (e.g. slate)

GROUNDWATER

Groundwater strike

Standing groundwater level

INSTALLATIONS

CEMENT SEAL

BENTONITE SEAL

FILTER PACK (SLOTTED PIPE)

SAMPLES

D	Small disturbed sample
J	Small disturbed sample (amber glass jar)
B	Disturbed bulk sample
U100	Undisturbed sample (100mm diameter)
W	Water sample

IN-SITU TESTING

SPT	Standard Penetration Test (split spoon sampler)
SPT(C)	Standard Penetration Test (solid cone)
V	Shear vane test
CBR	California Bearing Ratio (estimated from soil assessment (mexe) cone penetrometer)

ROTARY DRILLING

TCR	Total core recovery (%)
SCR	Solid core recovery (%)
RQD	Rock quality designation (%)
FI	Fracture Index (fractures/ m)
NI	Non-intact

SPT RESULTS (EXAMPLES)

30	"N" Value (blows recorded for 300mm penetration, following 150mm seating drive)
50/125	50 blows for 125mm penetration

IDENTIFICATION AND DESCRIPTION OF SOILS (Taken from BS 5930: 1999, Table 13)

Soil Group: Very coarse soils

Density/Compactness/Strength – Term	Density/Compactness/Strength – Field Test
Loose	By inspection of voids and particle packing
Dense	

Discontinuities – Term	Mean spacing mm
Scale of spacing of discontinuities	
Very widely	Over 2000
Widely	2000 to 600
Medium	600 to 200
Closely	200 to 60
Very closely	60 to 20
Extremely closely	Under 20

Bedding – Term	Mean thickness mm
Scale of bedding thickness	
Very thickly bedded	Over 2000
Thickly bedded	2000 to 600
Medium bedded	600 to 200
Thinly bedded	200 to 60
Very thinly bedded	60 to 20
Thickly laminated	20 to 6
Thinly laminated	Under 6

Colour: Red, Orange, Yellow, Brown, Green, Blue, White, Cream, Grey, Black etc.

Composite Soil Types (mixtures of basic soil types) – Term	Approx %[c] secondary
For mixtures involving very coarse soils	
Slightly (sandy[d])	<5
(sandy[d])	5 to 20 [b]
Very (sandy[d])	>20[b]
SAND AND GRAVEL	About 50[b]

Particle Shape: Angular, Sub angular, Sub rounded, Rounded, Flat, Tabular, Elongated

Minor constituent type: Calcareous, Shelly, Glauconitic, Micaceous

Using terms such as: slightly calcareous, calcareous, very calcareous

% defined on a site or material specific basis or subjective

Particle Size: 200, 60, Coarse, 20, Medium, 6, Fine, 2, Coarse, 0.6, Medium, 0.2, Fine, 0.06, Coarse, 0.02, Medium, 0.006, Fine, 0.002

Principal SOIL TYPE	Visual Identification
BOULDERS	Only seen complete in pits or exposures
COBBLES	Often difficult to recover whole from boreholes
GRAVEL	Easily visible to naked eye; particle shape can be described; Grading can be described
SAND	Visible to naked eye; No cohesion when dry; Grading can be described.
SILT	Only coarse silt visible with hand lens; Exhibits little plasticity and marked dilatancy; Slightly granular or silky to the touch; Disintegrates in water; Lumps dry quickly;
CLAY	Dry lumps can be broken but not powdered between the fingers; They also disintegrate under water but more slowly than silt; Smooth to the touch; Exhibits plasticity but no dilatancy; Sticks to the fingers and dries slowly; Shrinks appreciably on drying usually showing cracks

Minor Constituents: Shell fragments, pockets of peat, gypsum crystals, flint gravel, fragments of brick, rootlets, plastic bags etc.

using terms such as:

with rare

with occasional

with abundant/ frequent/ numerous

% defined on a site or material specific basis or subjective

Example Stratum Names: Recent Deposits; Alluvium; Weathered Mercia Mudstone; Lias Clay; Embankment Fill; Topsoil; Made Ground or Glacial Deposit ? etc.

Example Descriptions:

- Loose brown very sandy sub-angular fine to coarse flint GRAVEL with small pockets (up to 30 mm) of clay (Terrace Gravels)
- Medium dense light brown gravelly clayey fine SAND. Gravel is fine (Glacial Deposits)
- Stiff very closely sheared orange mottled brown slightly gravelly CLAY. Gravel is fine and medium of rounded quartzite. (Reworked Weathered London Clay)
- Firm thinly laminated grey CLAY with closely spaced thick laminae of sand. (Alluvium)
- Plastic brown clayey amorphous PEAT. (Recent Deposits)

Coarse soils (over ~65% sand and gravel sizes)

Density/Compactness/Strength – Term	Density/Compactness/Strength – Field Test
Borehole with SPT N-value	
Very loose	0-4
Loose	4-10
Medium dense	10-30
Dense	30-50
Very dense	>50
Slightly cemented	Visual examination: pick removes soil in lumps which can be abraded

Discontinuities		Bedding	
Fissured	Breaks into blocks along unpolished discontinuities	Inter-bedded	Alternating layers of different types, prequalified by thickness term if in equal proportions. Otherwise thickness of and spacing between subordinate layers defined.
Sheared	Breaks into blocks along polished discontinuities		

Fine soils (over ~35% silt and clay sizes)

Density/Compactness/Strength – Term	Density/Compactness/Strength – Field Test
Un-compact	Easily moulded or crushed in the fingers
Compact	Can be moulded or crushed by strong pressure in the fingers
Very soft C_u 0 – 20kPa	Finger easily pushed in up to 25mm
Soft C_u 20 – 40kPa	Finger pushed in up to 10mm
Firm C_u 40 – 75kPa	Thumb makes impression easily
Stiff C_u 75 – 150kPa	Can be indented slightly by thumb
Very stiff C_u 150 - 300kPa	Can be indented by thumb nail
Hard (or very weak mudstone) C_u > 300kPa	Can be scratched by thumb nail

Discontinuities: Spacing terms also used for distance between partings, isolated beds or laminae, desiccation, cracks, rootlets etc.

Bedding: Inter-laminated

Colour: Light, Dark, Mottled

Composite Soil Types (mixtures of basic soil types) – Term	Approx % [c] Secondary
Slightly (sandy[e])	<35
(sandy[e])	35 to 65[a]
Very (sandy[f])	>65[a]

Organic soils

Firm	Fibre already compressed together	Fibrous	Plant remains recognizable and retains some strength
Spongy	Very compressible and open structure	Pseudo-fibrous	Plant remains recognizable, Strength lost
Plastic	Can be moulded in hand and smears fingers	Amorphous	Recognizable plant remains absent

Transported mixtures	Colour	
Slightly organic clay or silt Slightly organic sand	Grey as mineral	Contains finely divided or discrete particles of organic matter, often with distinctive smell, may oxidize rapidly. Describe as for inorganic soils using terminology above.
Organic clay or silt Organic sand	Dark grey Dark grey	
Very organic clay or silt Very organic sand	Black Black	
Accumulated in situ	Predominantly plant remains, usually dark brown or black in colour, distinctive smell, low bulk density. Can contain disseminated or discrete mineral soils.	
Peat		

NOTES

a) Or described as coarse soil depending on mass behaviour

b) Or described as fine soil depending on mass behaviour

c) % coarse or fine soil type assessed excluding cobbles and boulders

d) Gravelly or sandy and/or silty or clayey

e) Gravelly and/or sandy

f) Gravelly or sandy

TRIAL PIT LOGS

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TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP01
Job No	Date	Ground Level (m)	Co-Ordinates ()	
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Contractor				Sheet
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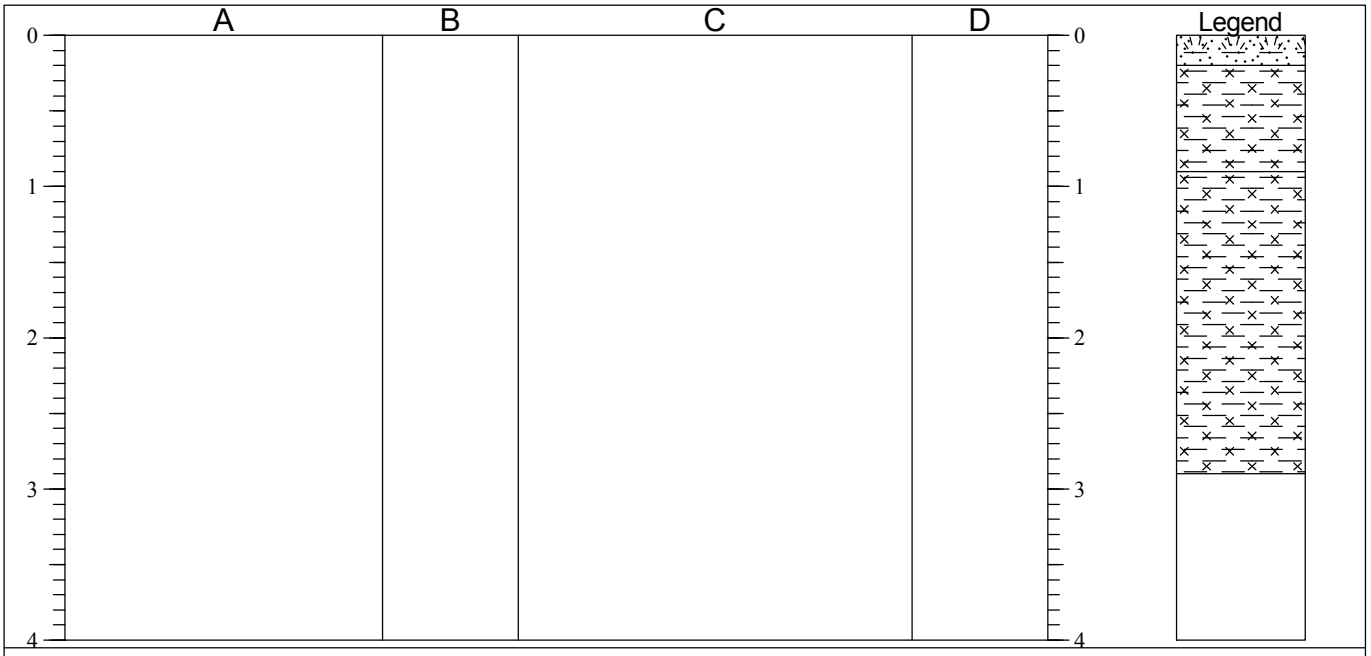
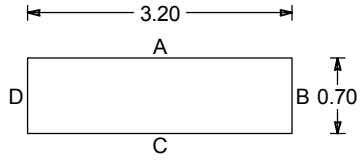


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown silty clay with frequent rootlets.			
0.20-0.90		Firm orangey brown silty CLAY. 0.60 ...gravelly			
0.90-2.90		Firm bluish grey slightly silty CLAY with occasional pockets of gravel and frequent pieces of shell material. 1.50 ...firm	1.00 1.00	D J	

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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TRIAL PIT LOG

Project				TRIAL PIT No
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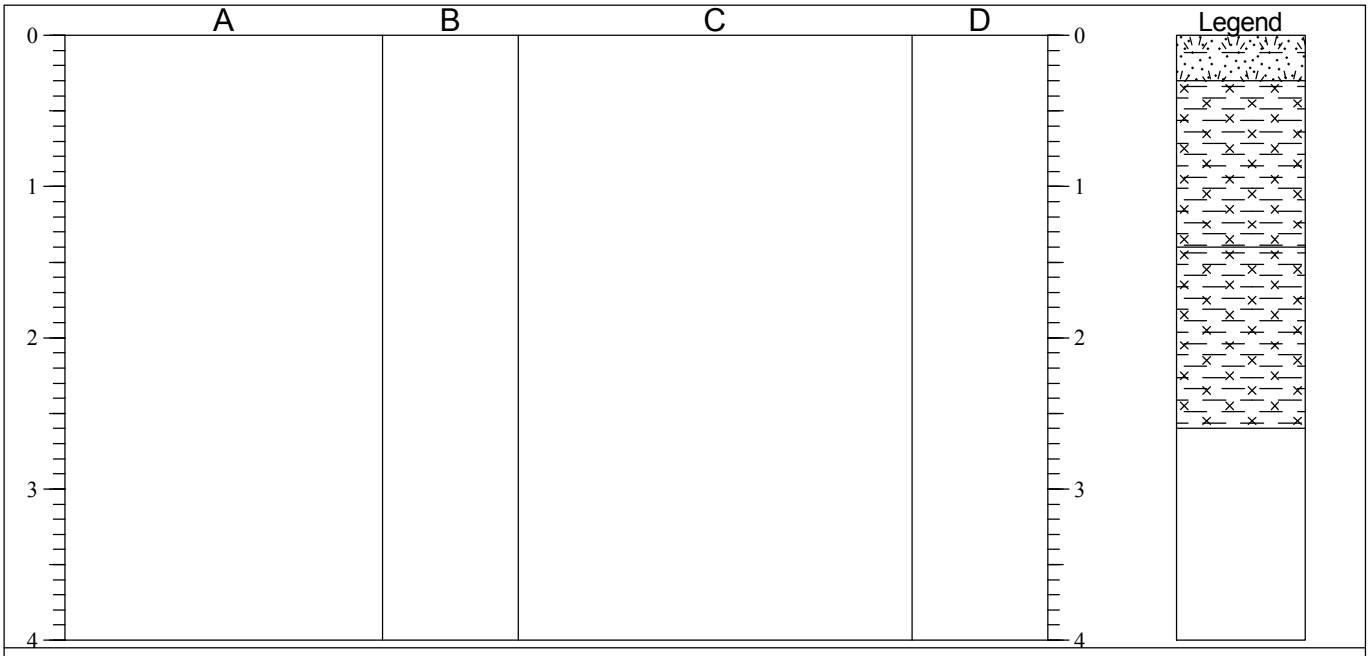
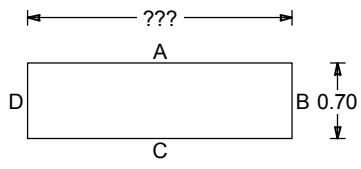


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-1.40		Firm orangey brown silty CLAY. 0.60 ...slightly gravelly			
1.40-2.60		Firm bluish grey silty CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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TRIAL PIT LOG

Project				TRIAL PIT No
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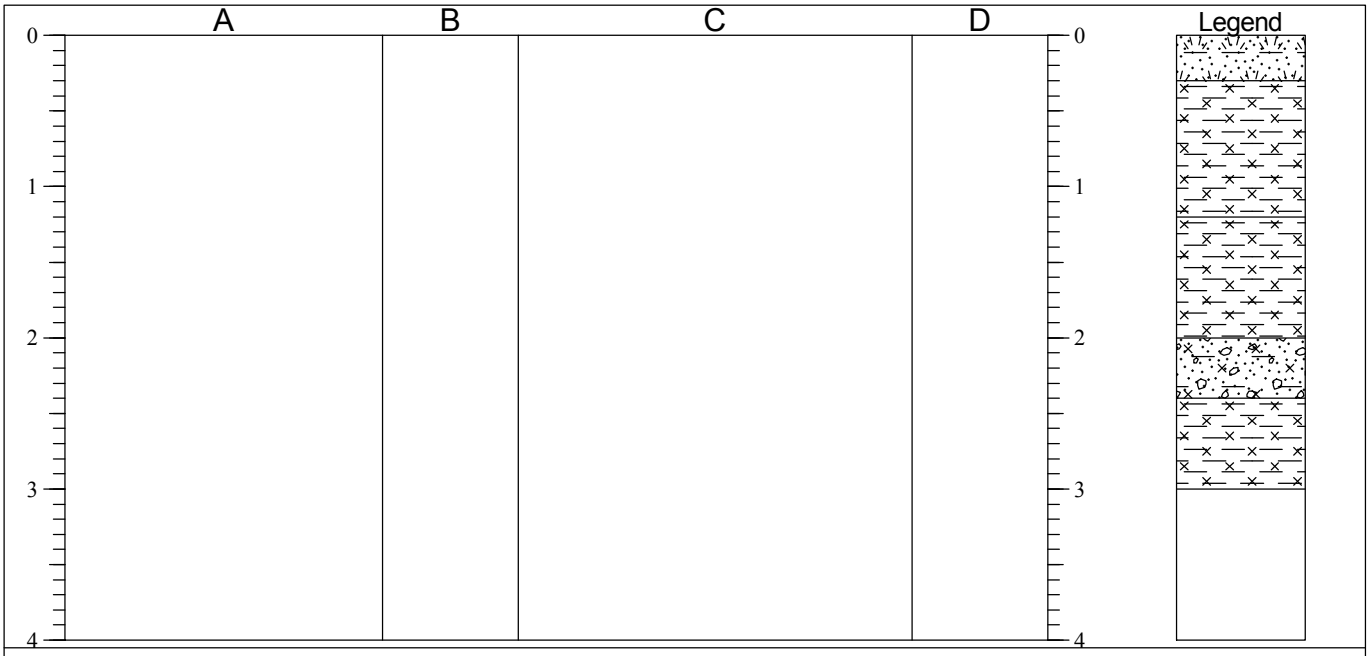
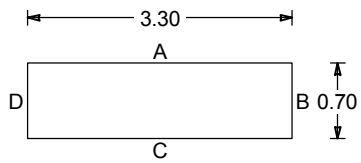


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-1.20		Soft to firm orangey brown silty CLAY.	0.50	J	
			1.00	VANE	40
1.20-2.00		Firm bluish grey mottled orange silty CLAY.			
		1.90 ...sandy, gravelly			
2.00-2.40		(Medium dense) bluish grey slightly clayey silty gravelly SAND.			
2.40-3.00		Firm bluish grey silty CLAY.			
			3.00	D	

Shoring/Support: None.
Stability: Stable.
Groundwater: Slight groundwater seepage at 2.20m.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used	JCB 8080 (8T tracked excavator)	Logged By	SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP04
Job No	Date	Ground Level (m)	Co-Ordinates ()	
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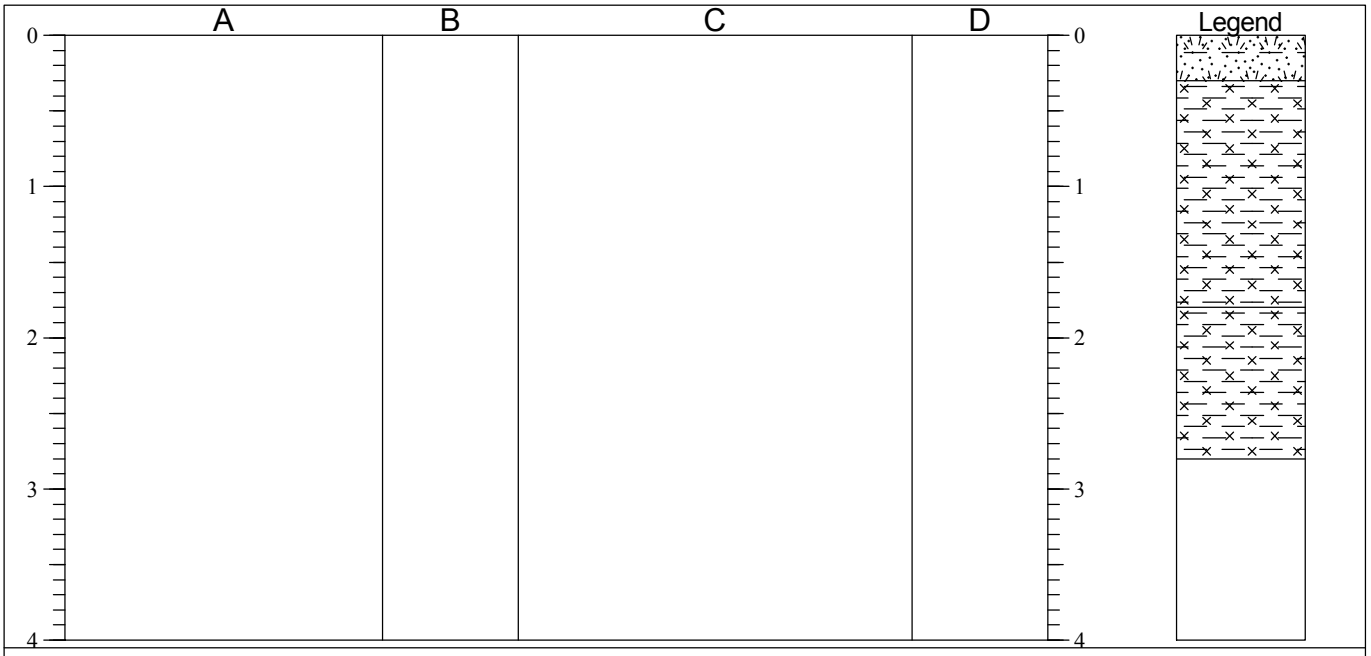
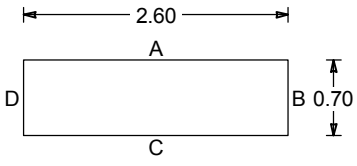


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-1.80		Firm orangey brown mottled bluish grey silty CLAY.	0.25	J	
		1.00 ...stiff	1.00	VANE	100
1.80-2.80		Firm bluish grey silty CLAY.			
		2.40 ...slightly sandy very gravelly	2.50	D	

Shoring/Support: None.
Stability: Stable.
Groundwater: Slight groundwater seepage at 2.50m.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP05
Job No	Date	Ground Level (m)	Co-Ordinates ()	
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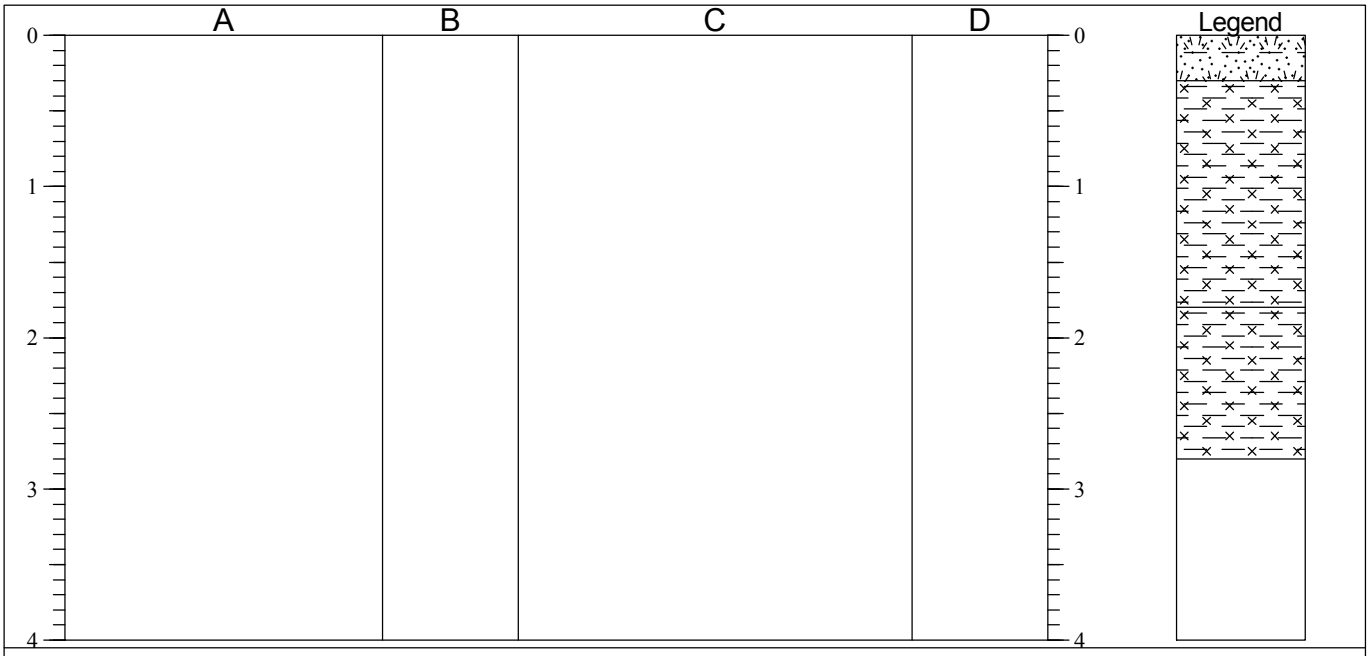
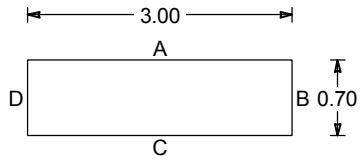


STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-1.80		Firm orangey brown mottled bluish grey silty CLAY.	0.50	J	
		1.00 ...stiff	1.00	D	
			1.00	VANE	100
		1.30 ...gravelly			
1.80-2.80		Firm bluish grey silty CLAY with frequent shell fragments.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				**TP06**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
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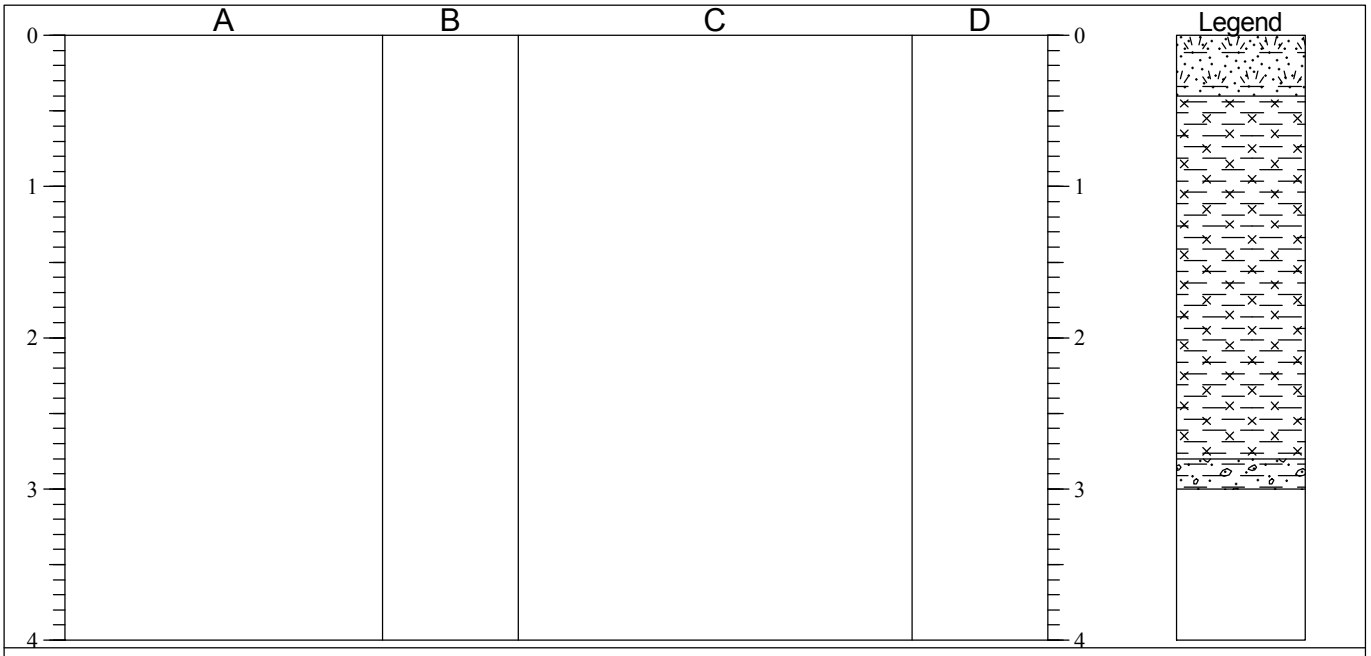
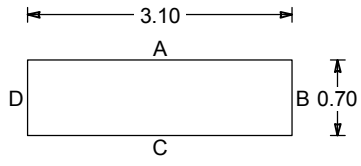
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		TOPSOIL: Brown silty clay with frequent rootlets.			
			0.25	J	
0.40-2.80		Soft to firm orangey brown silty CLAY.			
			1.00	VANE	100
		1.20 ...mottled bluish grey			
			2.00	D	
2.80-3.00		Firm bluish grey slightly sandy gravelly CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

Ruddlesden geotechnical ltd
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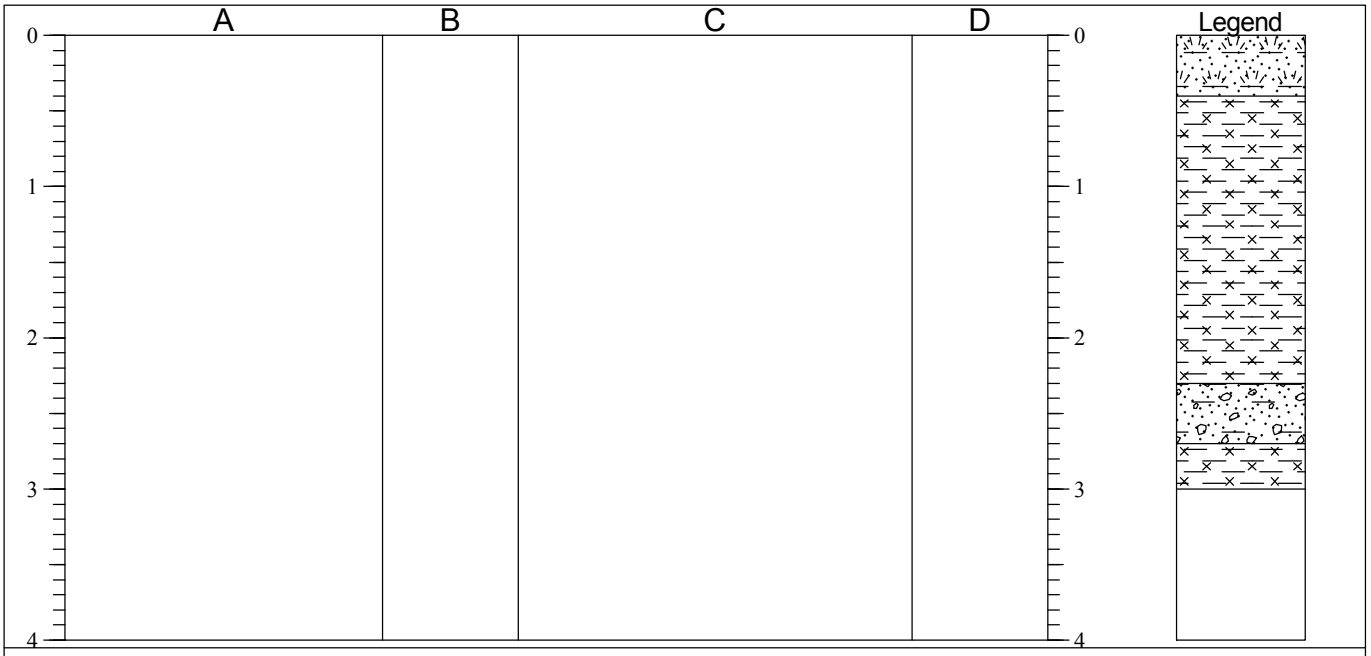
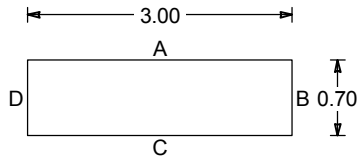
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP07
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		TOPSOIL: Brown silty clay with frequent rootlets.			
0.40-2.30		Firm orangey brown mottled blue silty CLAY.	0.50	J	
		1.10 ...bluish grey	1.00	VANE	90
			1.50	D	
2.30-2.70		(Medium dense) bluish grey clayey gravelly SAND.			
2.70-3.00		Firm bluish grey silty CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: Slight groundwater seepage at 2.70m.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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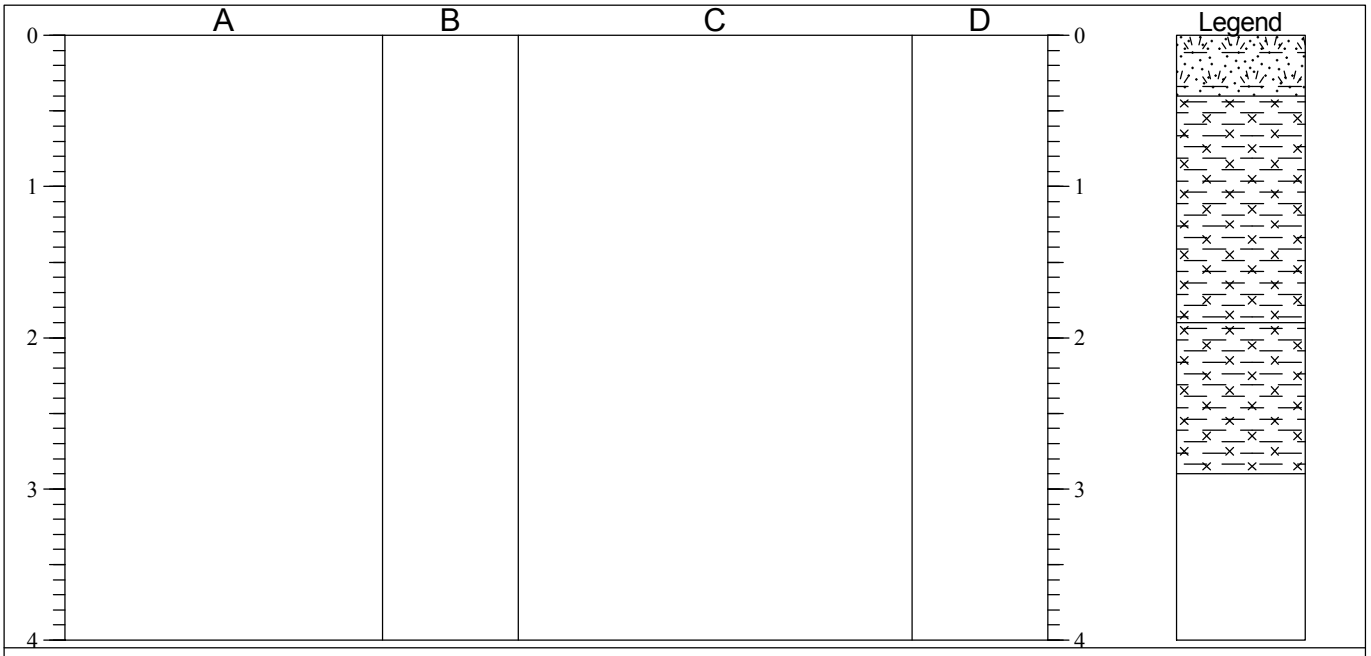
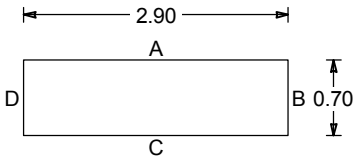
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				**TP08**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		TOPSOIL: Brown silty clay with frequent rootlets.			
0.40-1.90		Firm orangey brown mottled bluish grey silty CLAY.			
			0.75	J	
			1.00	VANE	70
		1.50 ...gravelly			
1.90-2.90		Stiff bluish grey silty CLAY.	2.00	D	

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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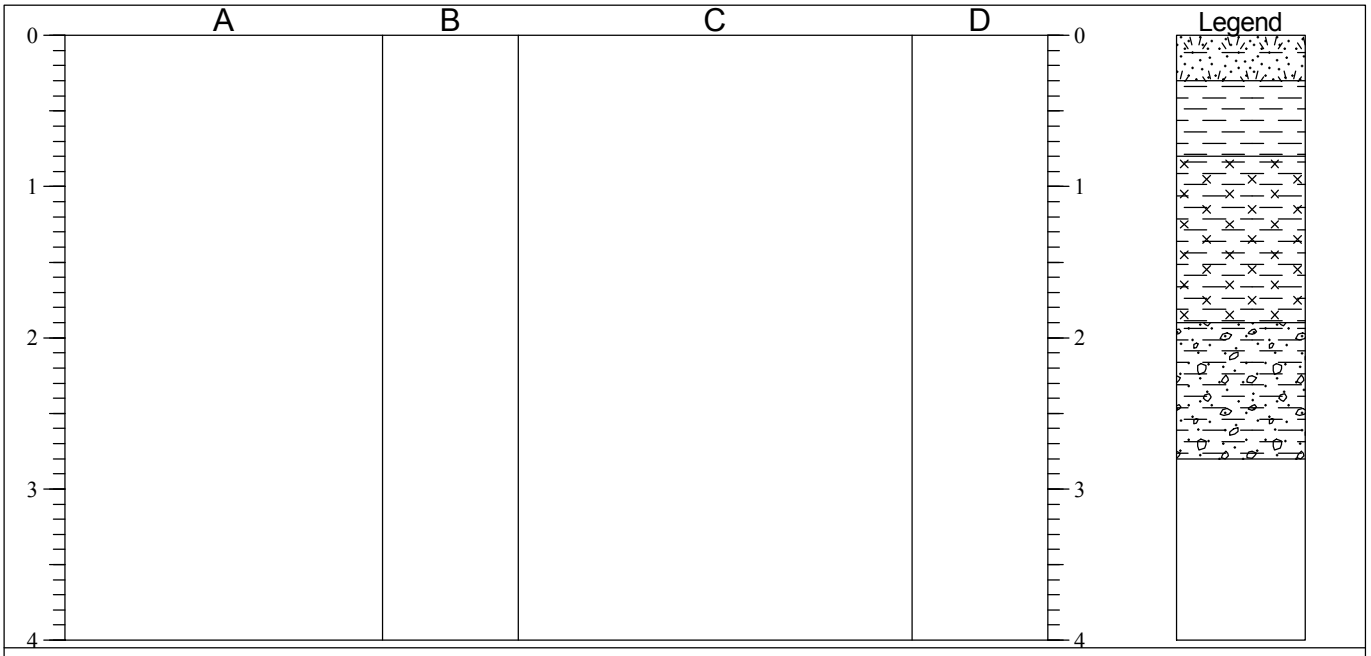
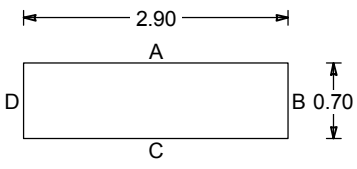
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP09
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-0.80		Firm bluish grey silty slightly sandy CLAY (possible MADE GROUND).			
0.80-1.90		Firm orangey brown mottled bluish grey silty CLAY. 1.30 ...slightly gravelly			
1.90-2.80		Firm bluish mottled brown grey slightly sandy very gravelly CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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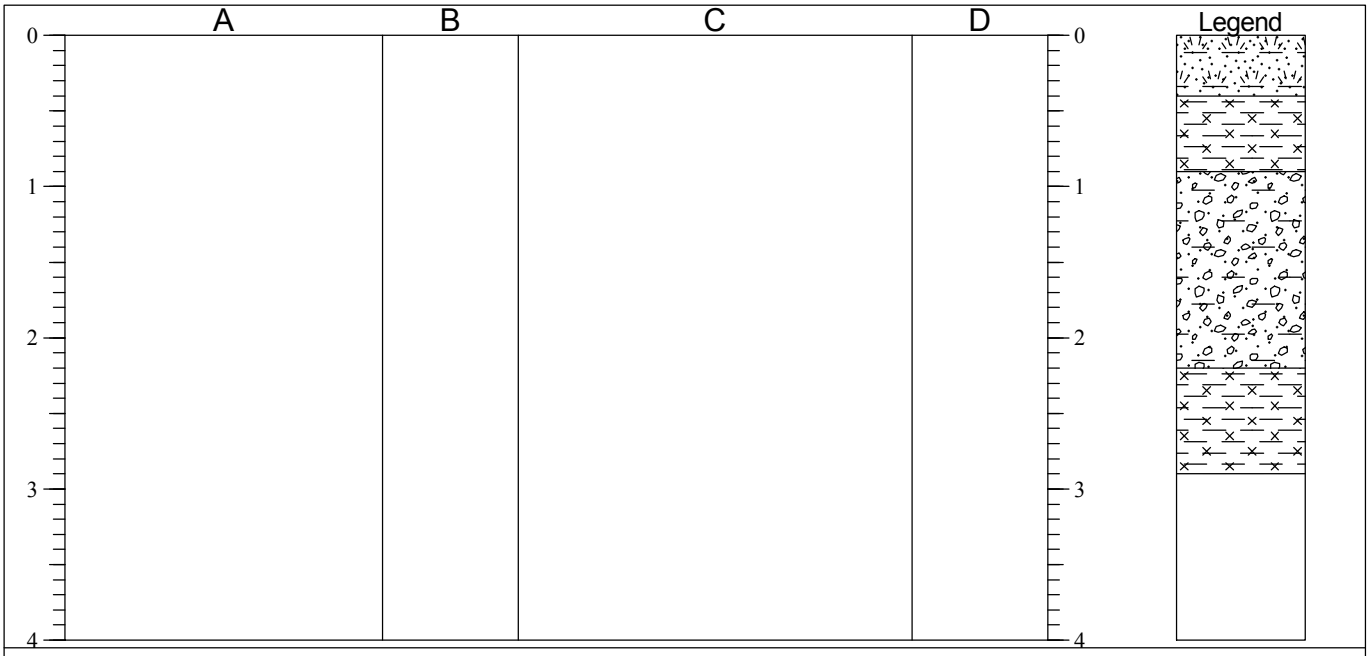
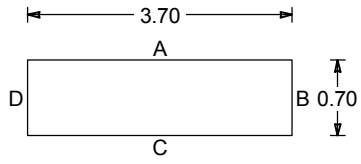
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				**TP10**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		TOPSOIL: Brown silty clay with frequent rootlet.			
0.40-0.90		Firm orangey brown silty CLAY.	0.50	J	
0.90-2.20		(Medium dense) orangey brown clayey slightly sandy GRAVEL (possible MADE GROUND).	1.00 1.00	B VANE	too gravelly
2.20-2.90		Stiff bluish grey slightly silty CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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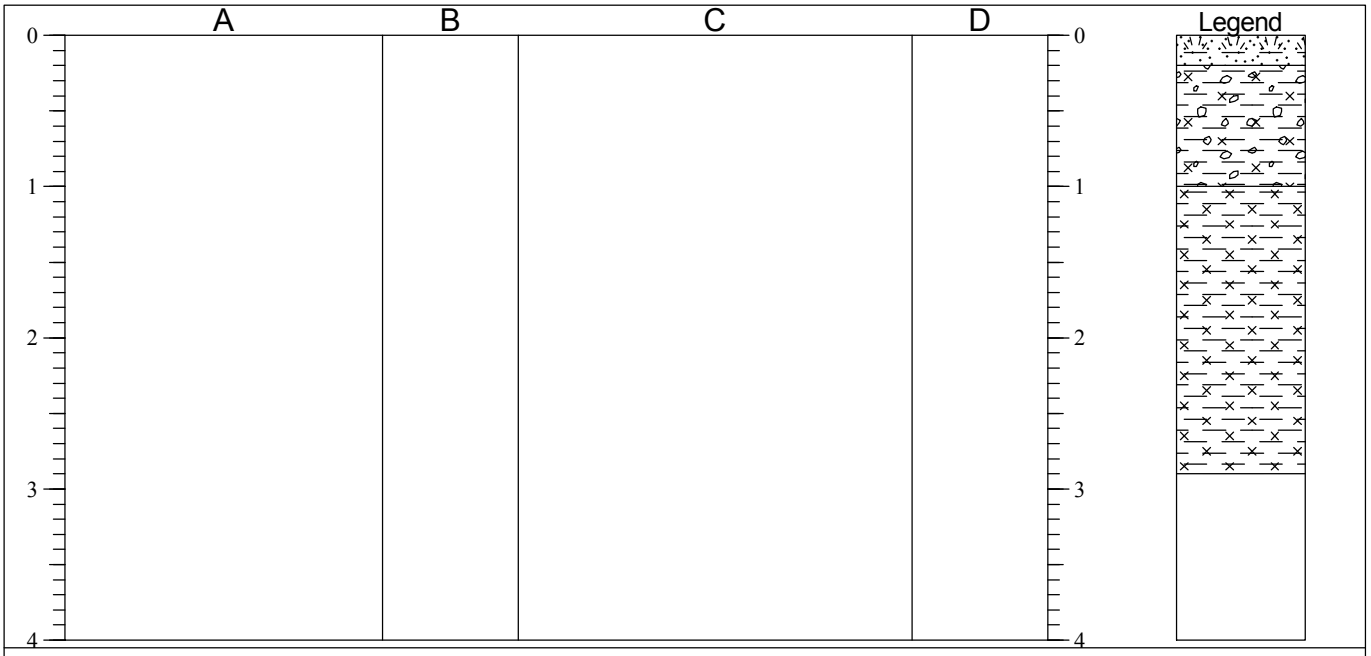
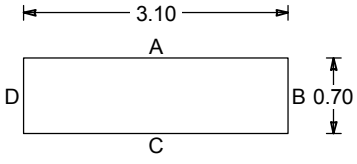
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP11
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown silty clay with frequent rootlets.			
0.20-1.00		Firm orangey brown silty slightly gravelly CLAY.	0.25	J	
1.00-2.90		Stiff bluish grey mottled orangey brown silty CLAY.	1.00	VANE	100
			2.00	D	
		2.70 ...gravelly			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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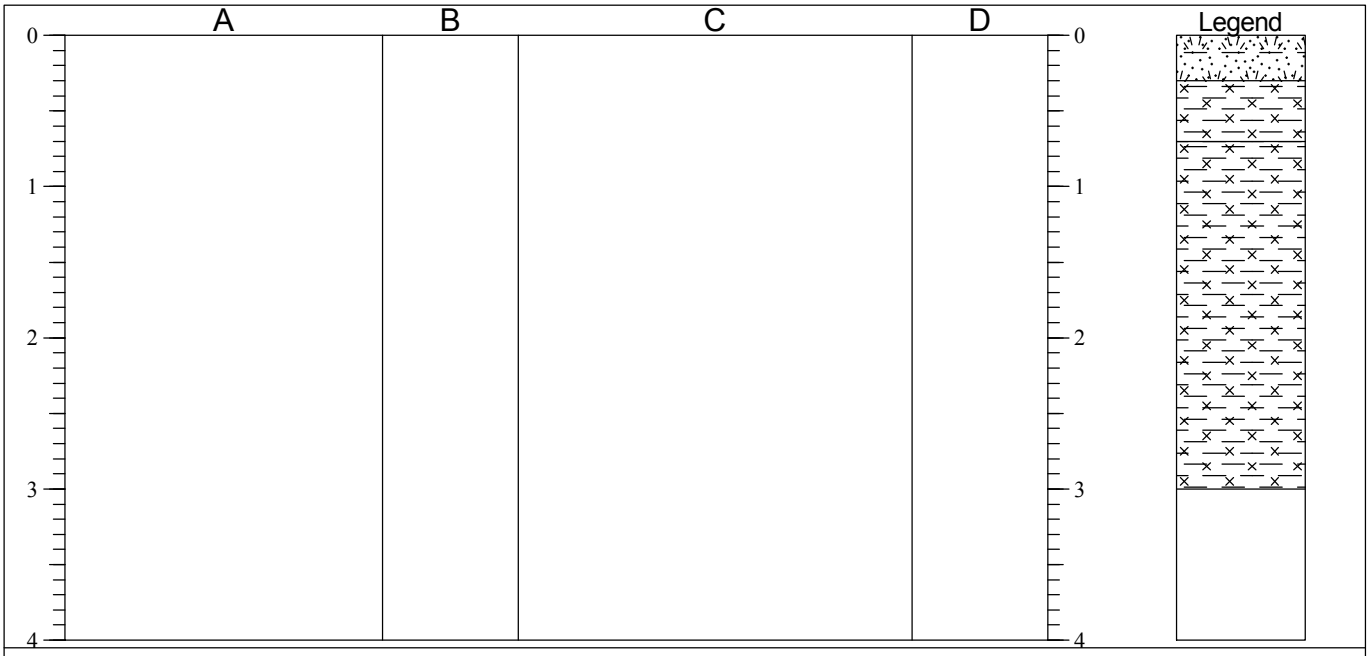
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP12
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1

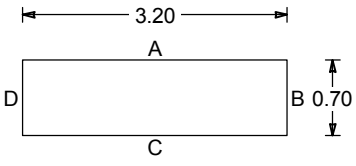


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-0.70		Firm orangey brown silty CLAY.			
0.70-3.00		Stiff bluish grey silty CLAY.	0.75	J	
		1.10 - 1.70 ...mottled brown	1.00	VANE	90
			1.50	D	

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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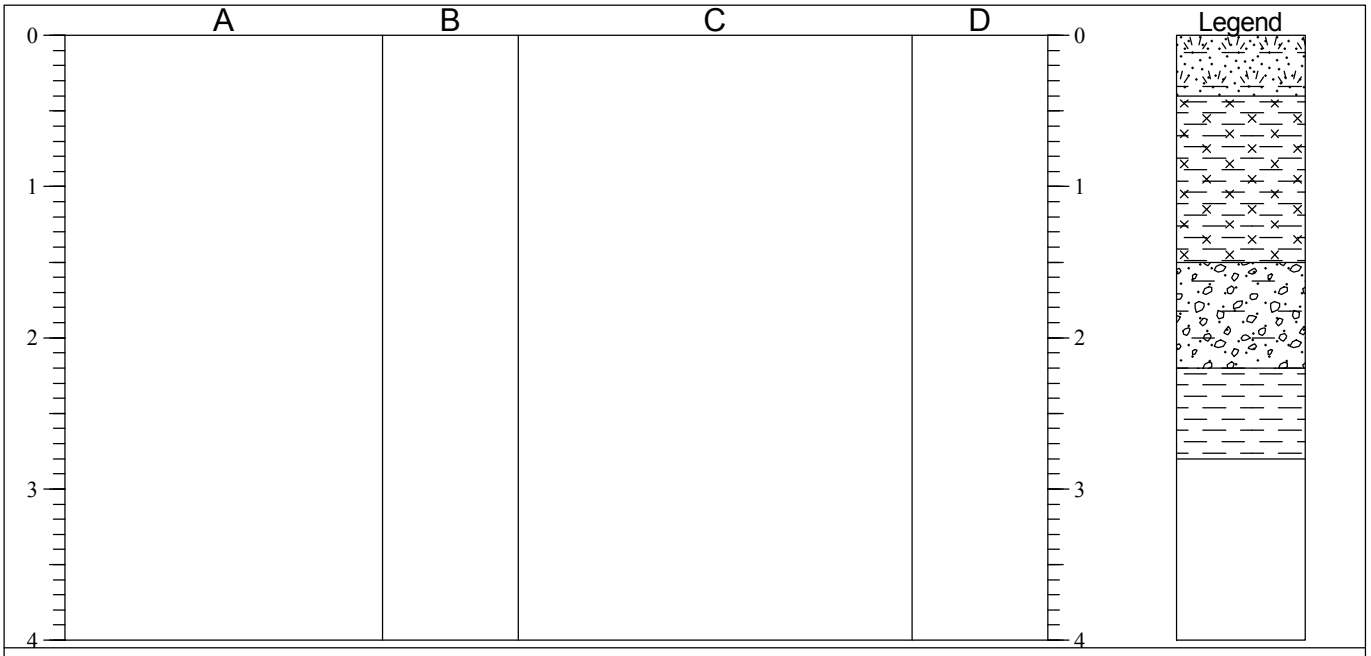
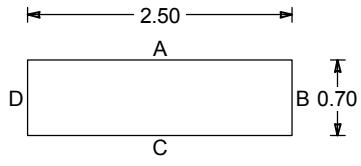
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP13
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.40		TOPSOIL: Brown silty clay with frequent rootlets.			
0.40-1.50		Firm orangey brown, mottled bluish grey silty CLAY.			
		1.00 ...stiff	1.00 1.00	J VANE	110
1.50-2.20		(Medium dense) bluish grey clayey, slightly sandy GRAVEL.			
			2.00	D	
2.20-2.80		Firm to stiff bluish grey CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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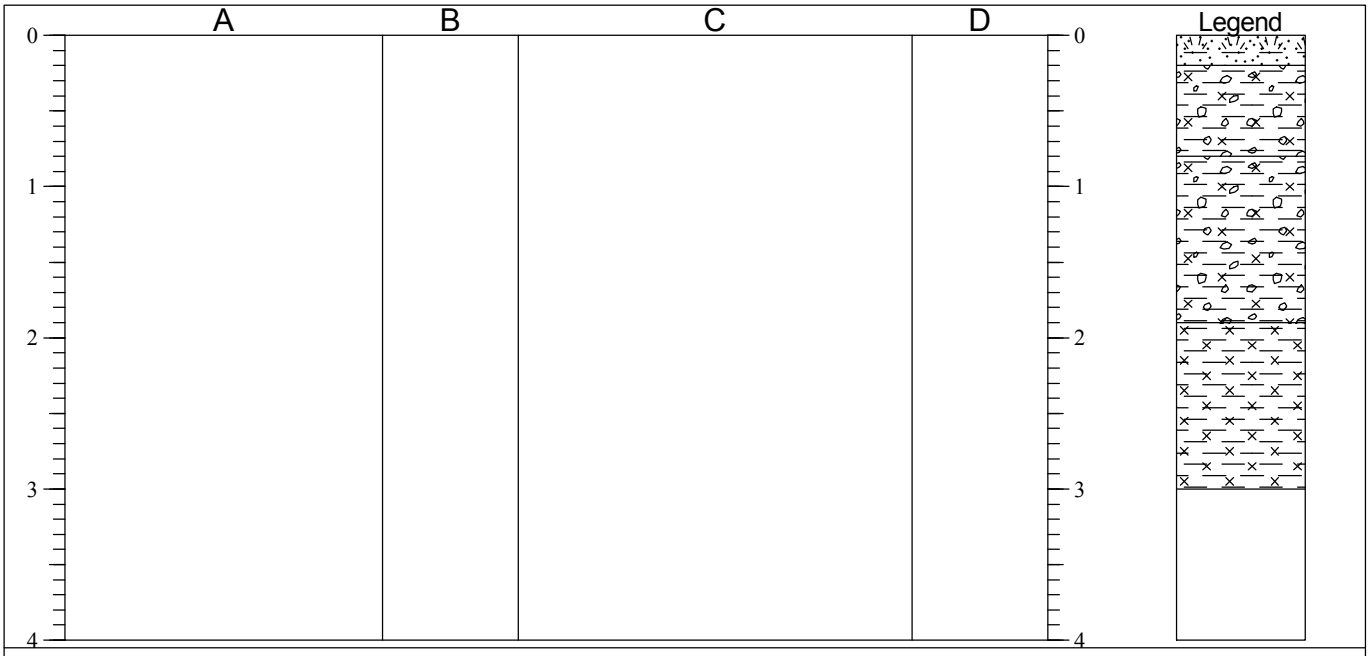
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				**TP14**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1

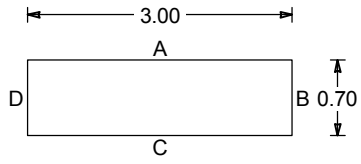


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown silty clay with frequent rootlets.			
0.20-0.80		Firm brown silty slightly gravelly CLAY (possible MADE GROUND).	0.25	J	
0.80-1.90		Stiff orangey brown mottled greyish blue silty slightly gravelly CLAY.	1.00	VANE	too gravelly
			1.50	D	
1.90-3.00		Stiff bluish grey silty CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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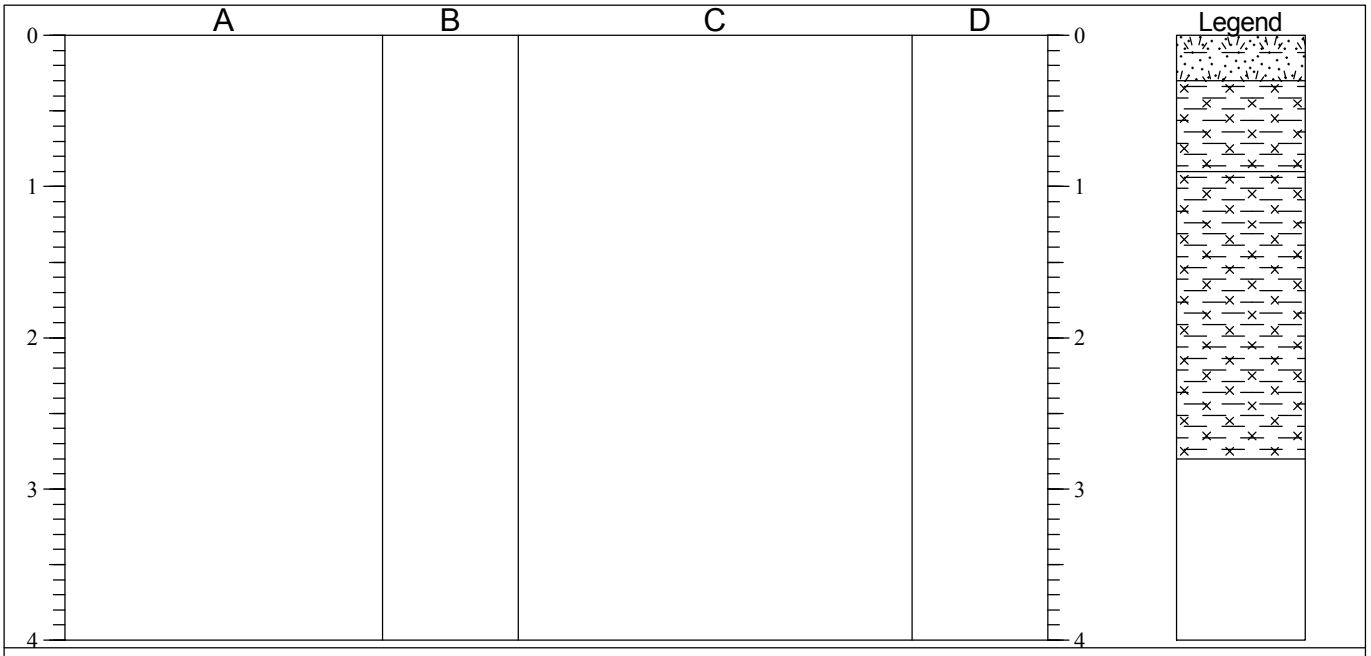
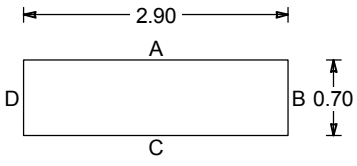
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP15
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-0.90		Firm orangey brown mottled greyish blue silty CLAY with occasional pieces of gravel.	0.50	J	
0.90-2.80		Firm to stiff bluish grey silty CLAY.	1.00	D	
			1.00	VANE	75
		1.50 - 2.10 ...mottled brown			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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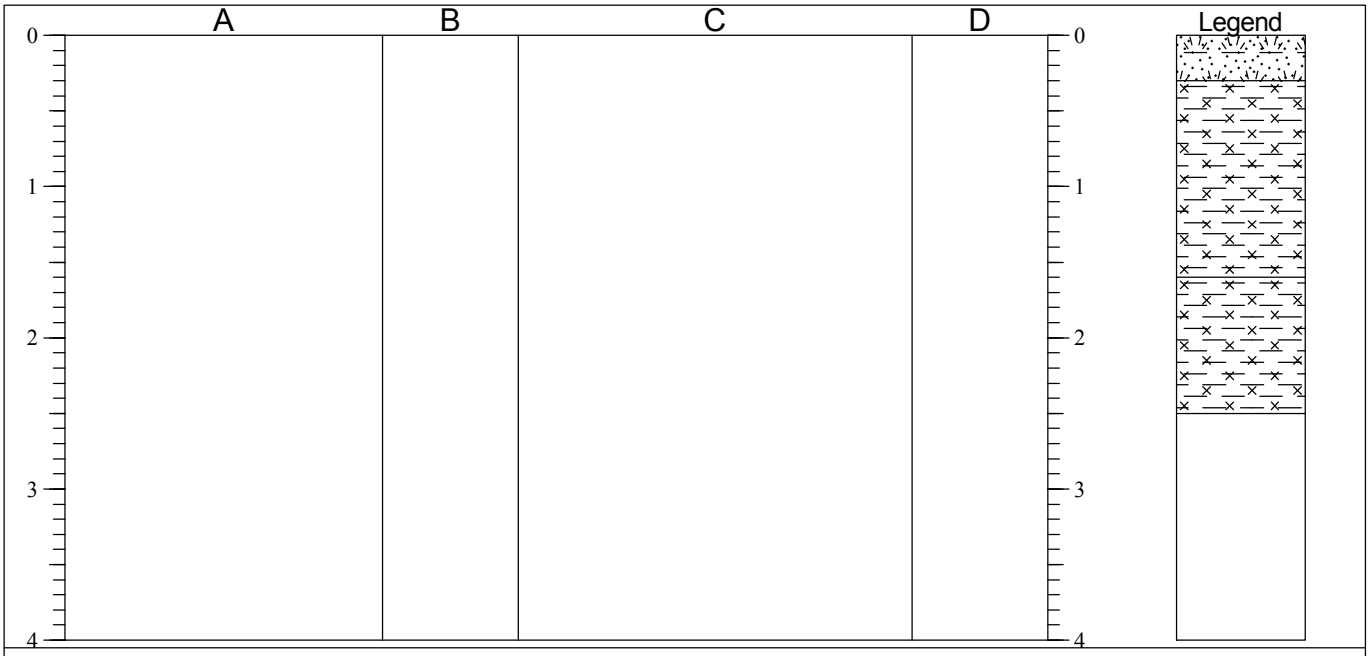
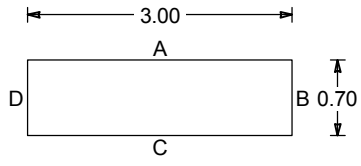
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP16
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty clay with frequent rootlets.			
0.30-1.60		Firm orangey brown silty CLAY.	0.30	J	
		0.90 ...very gravelly	1.00	VANE	too gravelly
			1.25	D	
1.60-2.50		Firm to stiff bluish grey silty CLAY.			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

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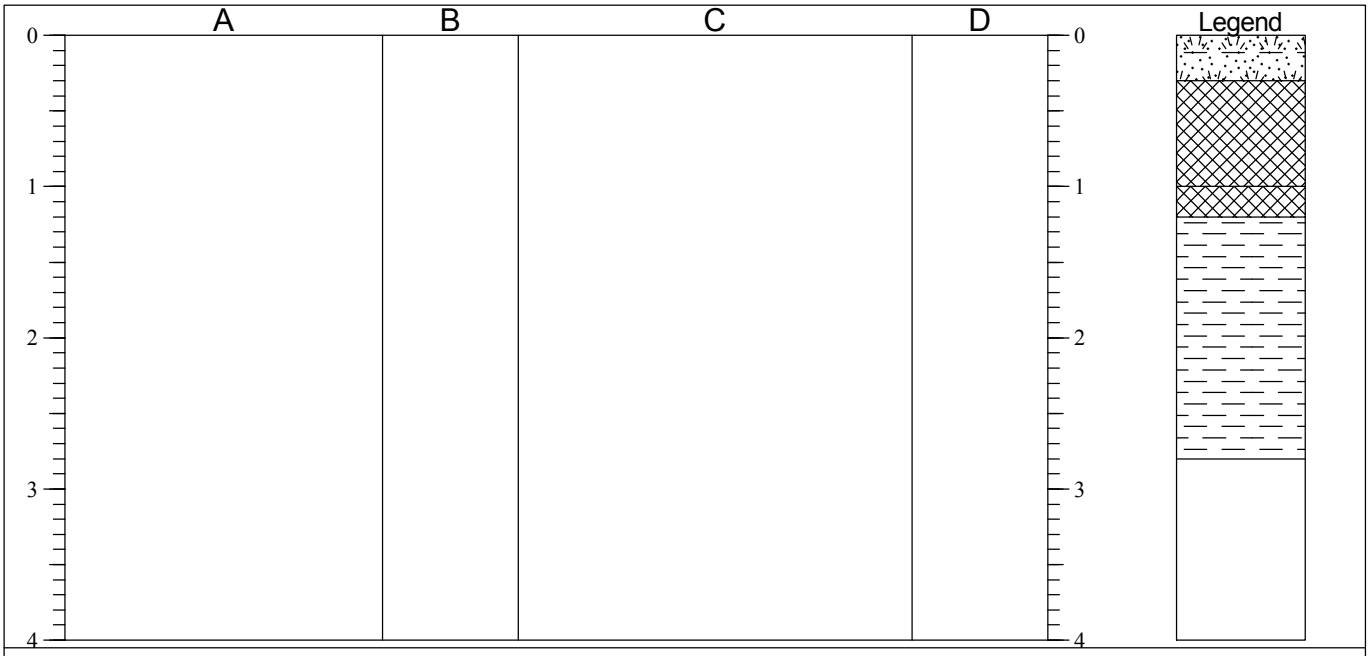
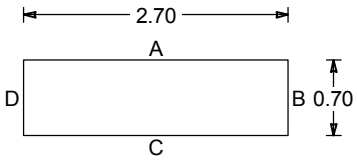
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP17
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.30		TOPSOIL: Brown silty slightly gravelly clay with frequent rootlets.			
0.30-1.00		MADE GROUND: Orangey brown silty gravelly clay.	0.50	J	
1.00-1.20		MADE GROUND: Soft brown silty slightly gravelly clay.	1.00	J	
1.20-2.80		Firm to stiff bluish grey mottled orangey brown CLAY.	2.50	D	

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

Ruddlesden geotechnical ltd
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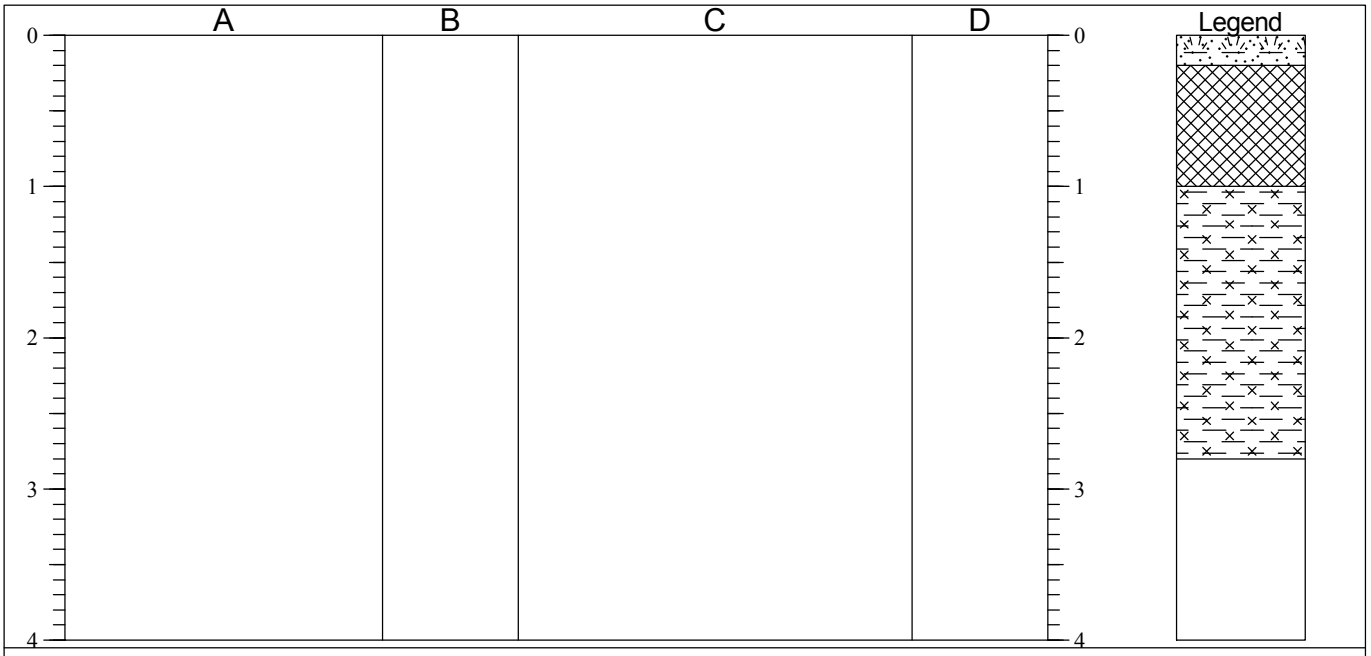
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				**TP18**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1

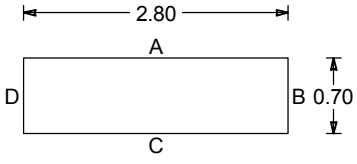


STRATA

SAMPLES & TESTS

Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown silty clay with frequent rootlets.			
0.20-1.00		MADE GROUND: Orangey brown silty slightly gravelly clay with occasional pieces of brickwork and ceramics.	0.50	J	
1.00-2.80		Firm orangey brown mottled bluish grey silty CLAY.	1.00 1.00	D VANE	 70
		2.30 ...gravelly			

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used: JCB 8080 (8T tracked excavator)	Logged By: SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

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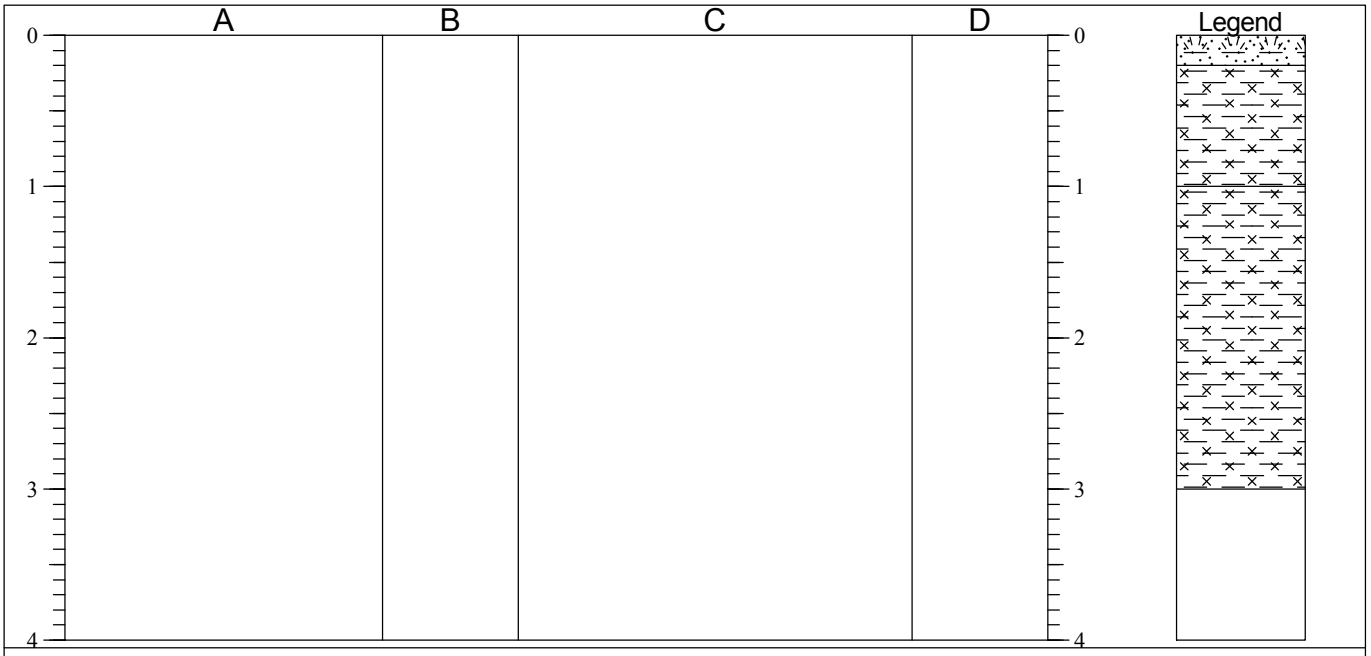
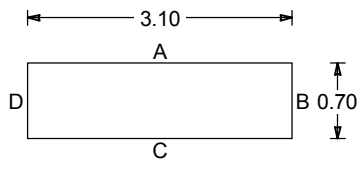
TRIAL PIT LOG

Project				TRIAL PIT No
Park Farm, Gillingham, Dorset				TP19
Job No	Date	Ground Level (m)	Co-Ordinates ()	
09157	25-01-10			
Contractor				Sheet
				1 of 1



STRATA			SAMPLES & TESTS		
Depth	No	DESCRIPTION	Depth	No	Remarks/Tests
0.00-0.20		TOPSOIL: Brown silty clay with frequent rootlets.			
0.20-1.00		Firm to stiff orangey brown silty CLAY.			
			0.50	J	
		0.90 ...gravelly			
1.00-3.00		Stiff bluish grey silty CLAY.	1.00	D	
			1.00	VANE	130

Shoring/Support: None.
Stability: Stable.
Groundwater: None encountered.



GENERAL REMARKS

All dimensions in metres Scale 1:50	Client: C.G. Fry & Son	Method/ Plant Used	JCB 8080 (8T tracked excavator)	Logged By	SB

AGS3 UK TP 09157 - PARK FARM, GILLINGHAM, DORSET.GPJ AGS 3_1.GDT 29/03/10

SOAKAWAY TEST RESULTS

Soakaway Test Results
In Accordance with BRE 365 "Soakaway Design"

Job Title:	Park Farm, Gillingham, Dorset
Job No.:	09157
Client:	C.G. Fry & Son
Date:	Mar-10

Test No. TP02

Trial Pit Dimensions

Length (m):	3.00
Width (m):	0.70
Depth (m):	2.60
Start Water Level (m):	1.06
Total Depth of Test	1.54

Field Results

Time (minutes)	Water Level (mBGL)
0	1.06
1	1.06
2	1.06
3	1.06
4	1.06
5	1.06
420	1.04

Soakaway Test Results
In Accordance with BRE 365 "Soakaway Design"

Calculations

Soil Infiltration Rate (f) = $(V_{p75-25}) / (a_{p50} \times t_{p75-25})$

Where

V_{p75-25} = effective storage volume of water in the trial pit between 75% and 25% effective depth

= 3.00 x 0.70 x 0.77

= 1.617 m^3

a_{p50} = internal surface area of the trial pit up to 50% effective depth and including the base area

= 1.08 + 4.62 + 2.10

= 7.798 m^2

t_{p75-25} = time for the water level to fall from 75% to 25% effective depth

25% effective depth = 1.445

75% effective depth = 2.215

= - mins

= 0 mins

= 0 secs

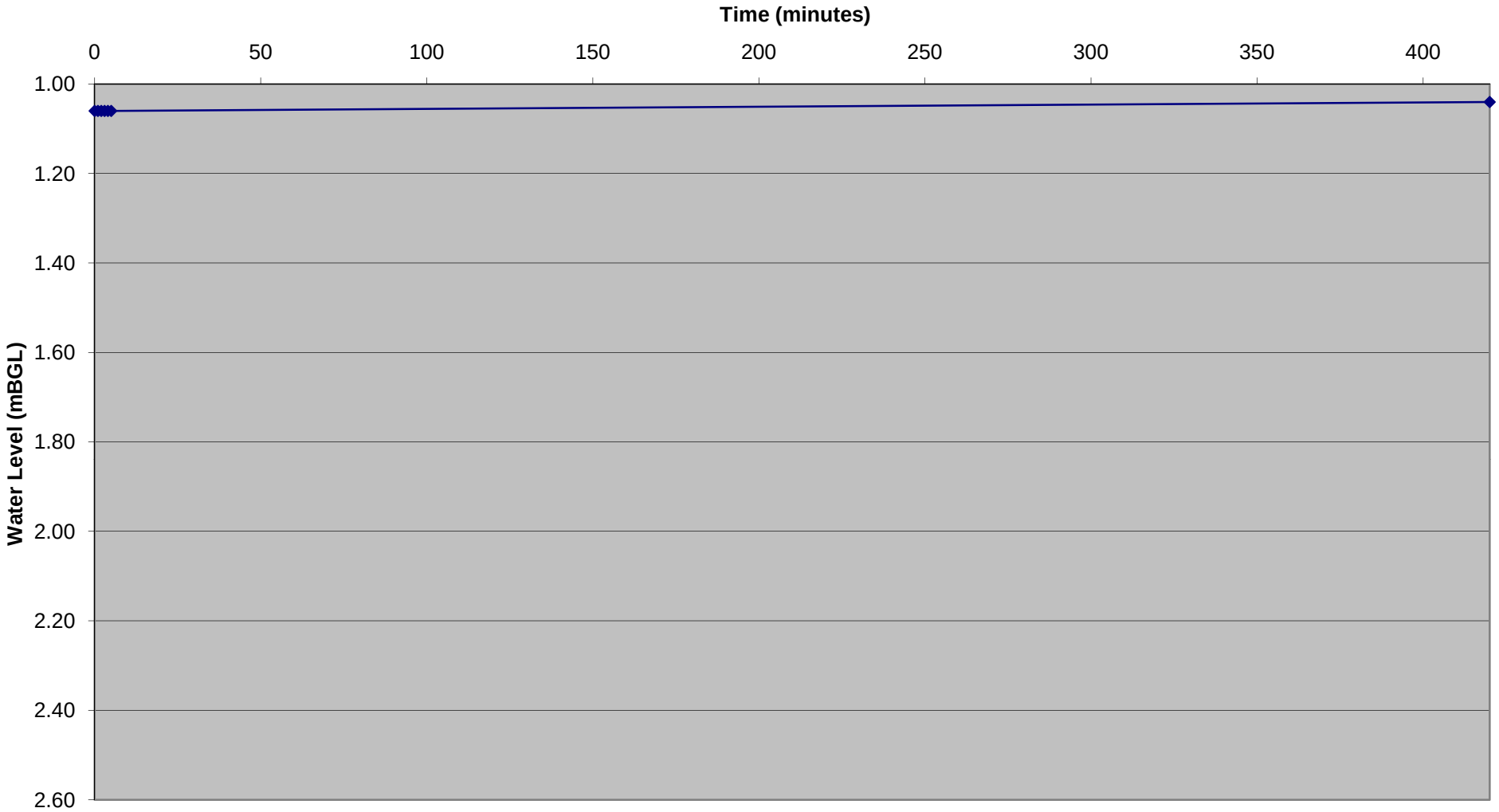
Soil Infiltration Rate (f) = $(V_{p75-25}) / (a_{p50} \times t_{p75-25})$

= 1.617 / 7.8 x 0

= #DIV/0! m/s

OTHER NOTES:

Soakaway Test Results - TP02



Soakaway Test Results
In Accordance with BRE 365 "Soakaway Design"

Job Title:	Park Farm, Gillingham, Dorset
Job No.:	09157
Client:	C.G. Fry & Son
Date:	Mar-10

Test No. TP09

Trial Pit Dimensions

Length (m):	2.90
Width (m):	0.70
Depth (m):	2.80
Start Water Level (m):	1.03
Total Depth of Test	1.77

Field Results

Time (minutes)	Water Level (mBGL)
0	1.03
1	1.03
2	1.03
3	1.03
4	1.03
5	1.03
372	0.70

Soakaway Test Results
In Accordance with BRE 365 "Soakaway Design"

Calculations

Soil Infiltration Rate (f) = $(V_{p75-25}) / (a_{p50} \times t_{p75-25})$

Where

V_{p75-25} = effective storage volume of water in the trial pit between 75% and 25% effective depth

= 2.90 x 0.70 x 0.89

= 1.79655 m^3

a_{p50} = internal surface area of the trial pit up to 50% effective depth and including the base area

= 1.24 + 5.13 + 2.03

= 8.402 m^2

t_{p75-25} = time for the water level to fall from 75% to 25% effective depth

25% effective depth = 1.4725

75% effective depth = 2.3575

= - mins

= 0 mins

= 0 secs

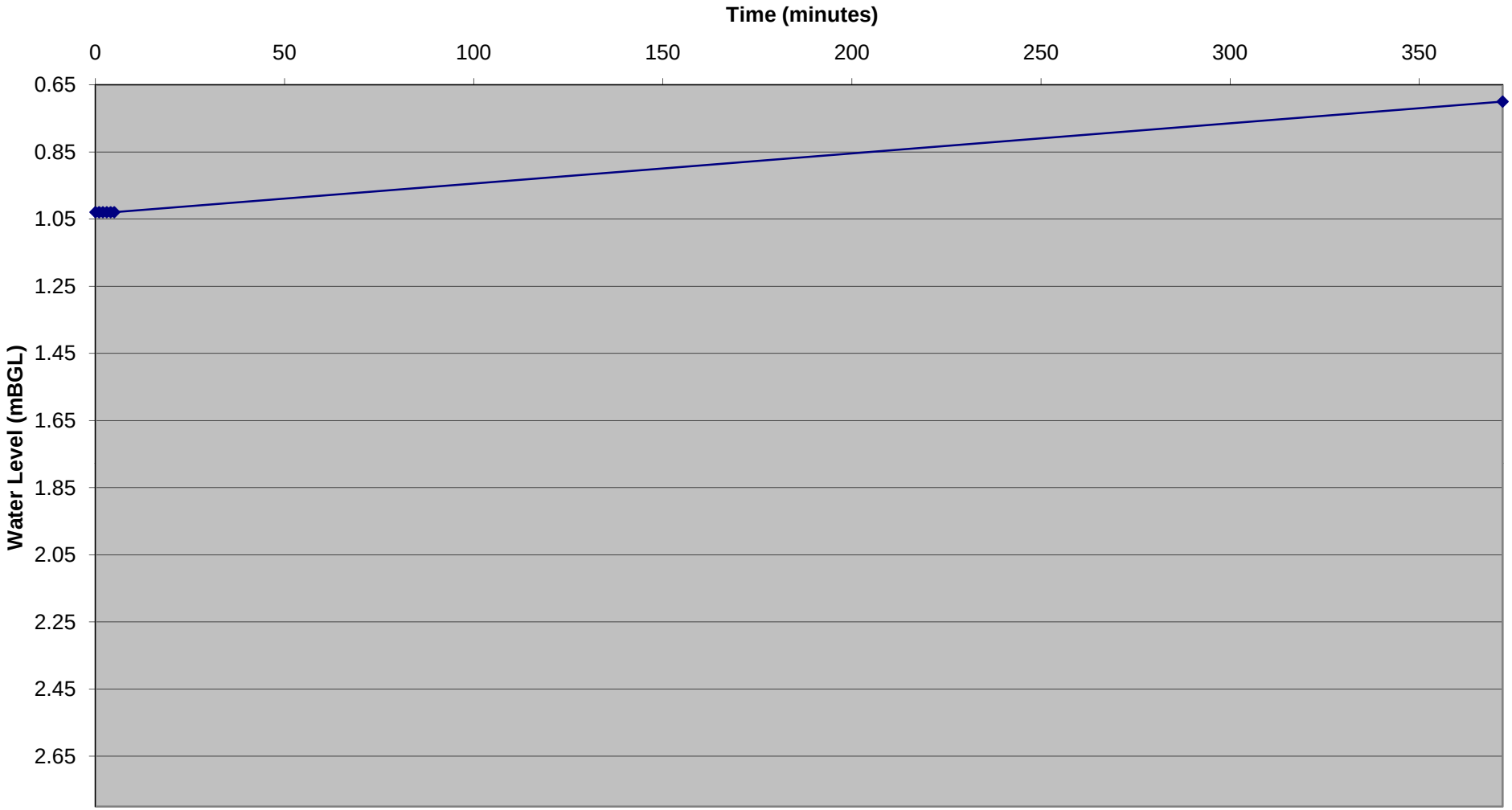
Soil Infiltration Rate (f) = $(V_{p75-25}) / (a_{p50} \times t_{p75-25})$

= 1.79655 / 8.4 x 0

= #DIV/0! m/s

OTHER NOTES: Some collapse of trial pit sides.

Soakaway Test Results - TP09



Soakaway Test Results
In Accordance with BRE 365 "Soakaway Design"

Job Title:	Park Farm, Gillingham, Dorset
Job No.:	09157
Client:	C.G. Fry & Son
Date:	Mar-10

Test No. TP15

Trial Pit Dimensions

Length (m):	2.90
Width (m):	0.70
Depth (m):	2.80
Start Water Level (m):	0.90
Total Depth of Test	1.90

Field Results

Time (minutes)	Water Level (mBGL)
0	0.90
1	0.90
2	0.90
3	0.90
4	0.90
5	0.90
308	0.89

Soakaway Test Results
In Accordance with BRE 365 "Soakaway Design"

Calculations

Soil Infiltration Rate (f) = $(V_{p75-25}) / (a_{p50} \times t_{p75-25})$

Where

V_{p75-25} = effective storage volume of water in the trial pit between 75% and 25% effective depth

= 2.90 x 0.70 x 0.95

= 1.9285 m^3

a_{p50} = internal surface area of the trial pit up to 50% effective depth and including the base area

= 1.33 + 5.51 + 2.03

= 8.87 m^2

t_{p75-25} = time for the water level to fall from 75% to 25% effective depth

25% effective depth = 1.375

75% effective depth = 2.325

= - mins

= 0 mins

= 0 secs

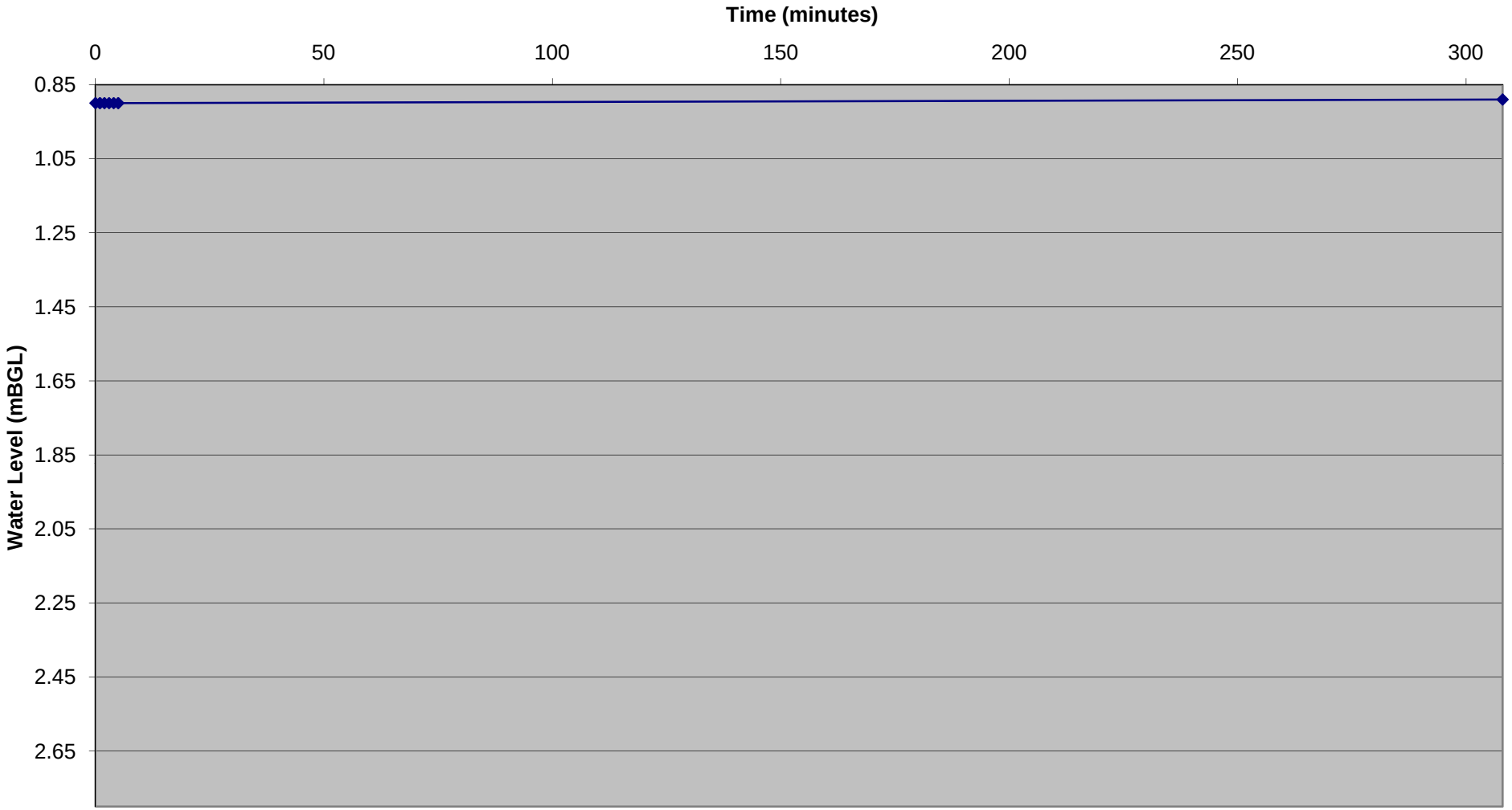
Soil Infiltration Rate (f) = $(V_{p75-25}) / (a_{p50} \times t_{p75-25})$

= 1.9285 / 8.87 x 0

= #DIV/0! m/s

OTHER NOTES:

Soakaway Test Results - TP15



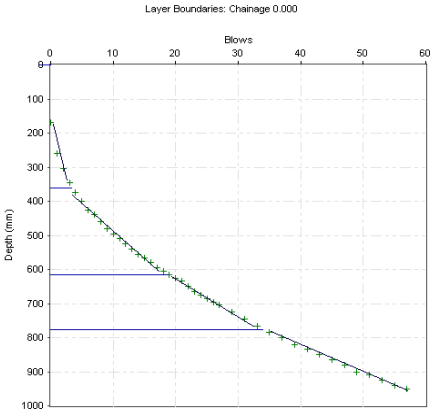
IN-SITU CBR (TRL DCP METHOD) TEST RESULTS

UK DCP V3.1

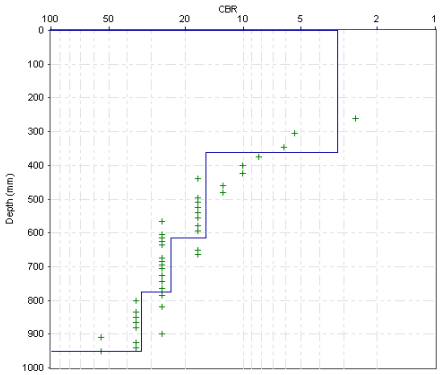
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP1

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	73.42	3	361	361	Subgrade	--	--	--	--
2	16.41	16	254	615	Subgrade	--	--	--	--
3	11.15	24	161	776	Subgrade	--	--	--	--
4	7.93	34	174	950	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.13	0.13
Pavement Strength	--	0.13	0.13

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

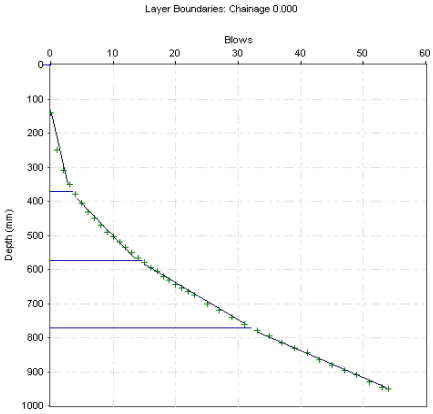
Report produced by .....

UK DCP V3.1

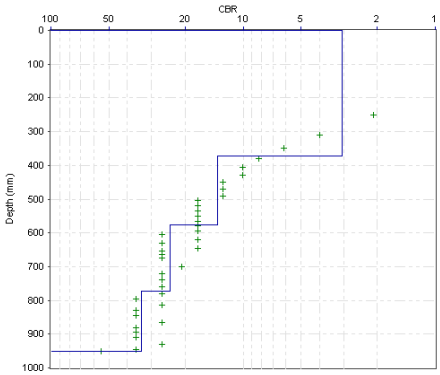
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP2

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	77.05	3	371	371	Subgrade	--	--	--	--
2	18.89	14	204	575	Subgrade	--	--	--	--
3	11.04	24	197	772	Subgrade	--	--	--	--
4	7.92	34	178	950	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	SN	SNC	SNP
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.07	0.07
Pavement Strength	--	0.07	0.07

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

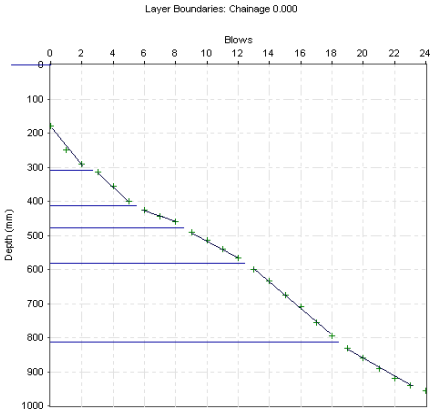
Report produced by .....

UK DCP V3.1

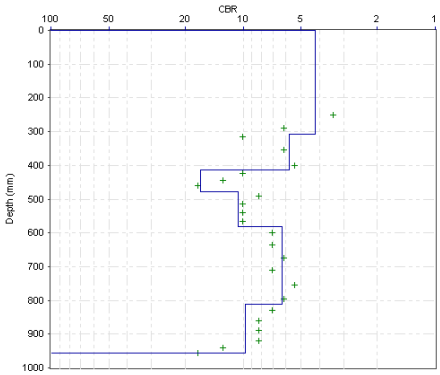
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP3

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	56.80	4	308	308	Subgrade	--	--	--	--
2	42.60	6	106	414	Subgrade	--	--	--	--
3	15.46	17	63	477	Subgrade	--	--	--	--
4	23.87	11	105	582	Subgrade	--	--	--	--
5	38.95	6	230	812	Subgrade	--	--	--	--
6	25.91	10	143	955	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.43	0.43
Pavement Strength	--	0.43	0.43

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

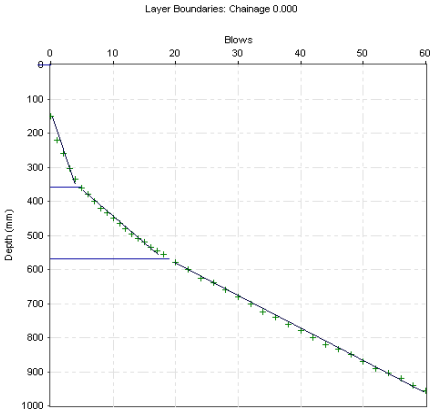
Report produced by .....

UK DCP V3.1

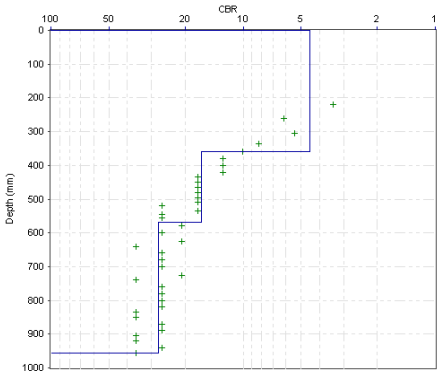
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP4

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	53.52	4	359	359	Subgrade	--	--	--	--
2	15.73	16	209	568	Subgrade	--	--	--	--
3	9.58	28	387	955	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.50	0.50
Pavement Strength	--	0.50	0.50

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

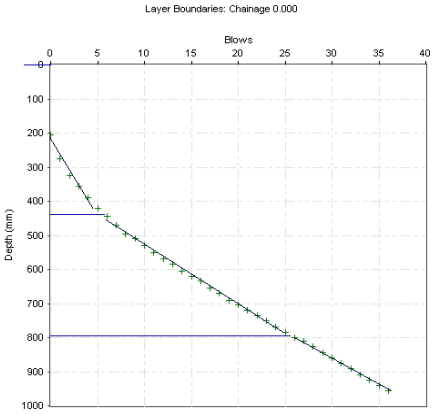
Report produced by .....

UK DCP V3.1

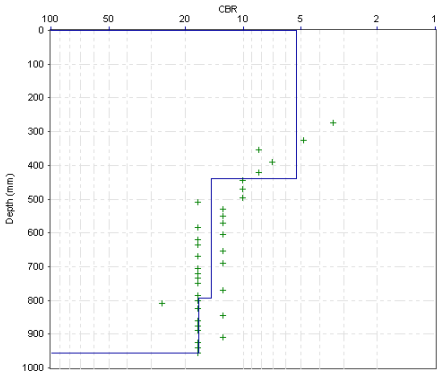
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP5

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	45.92	5	440	440	Subgrade	--	--	--	--
2	17.53	15	354	794	Subgrade	--	--	--	--
3	15.17	17	161	955	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.66	0.66
Pavement Strength	--	0.66	0.66

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

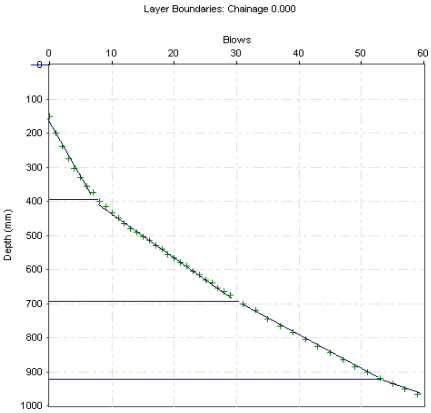
Report produced by .....

UK DCP V3.1

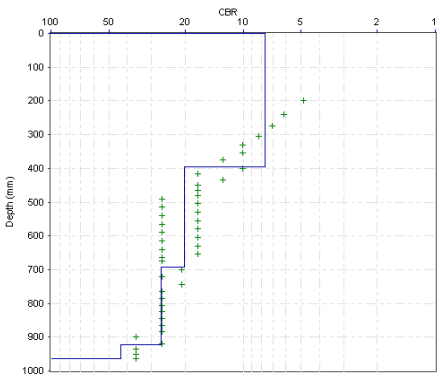
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP6

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	32.09	8	395	395	Subgrade	--	--	--	--
2	12.93	20	298	693	Subgrade	--	--	--	--
3	9.91	27	229	922	Subgrade	--	--	--	--
4	6.30	43	43	965	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	1.02	1.02
Pavement Strength	--	1.02	1.02

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

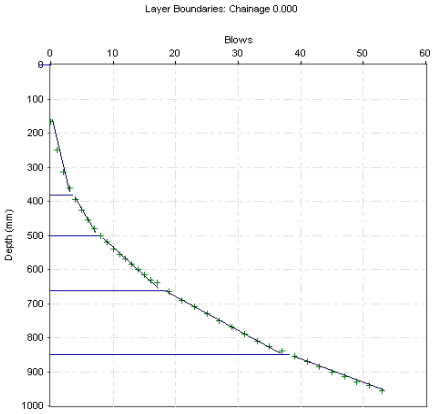
Report produced by .....

UK DCP V3.1

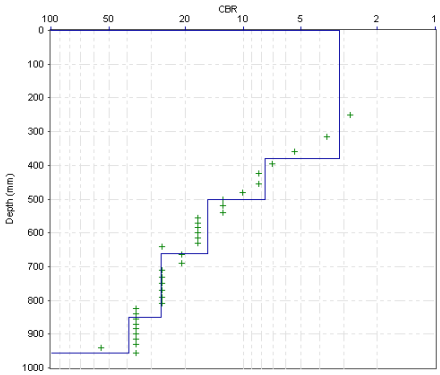
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP7

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	75.00	3	381	381	Subgrade	--	--	--	--
2	32.22	8	120	501	Subgrade	--	--	--	--
3	16.91	15	161	662	Subgrade	--	--	--	--
4	9.96	27	188	850	Subgrade	--	--	--	--
5	6.91	39	105	955	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.11	0.11
Pavement Strength	--	0.11	0.11

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

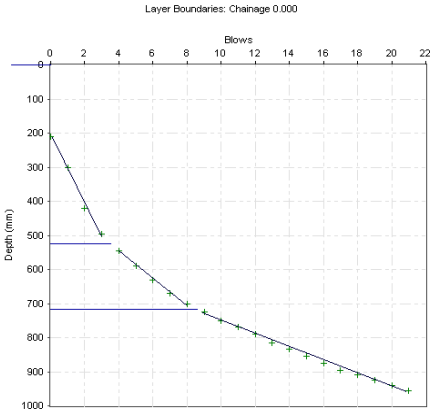
Report produced by .....

UK DCP V3.1

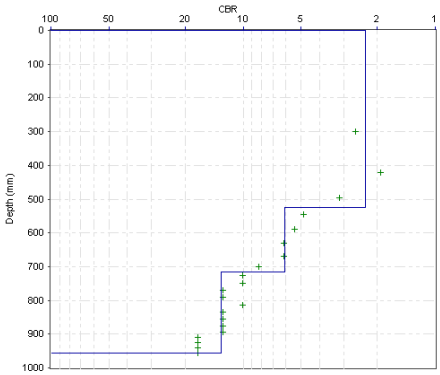
DCP Layer Strength Analysis Report

Project Name: 09157 - Park Farm, Gillingham DCP8

Chainage (km):	0.000	Surface Type:	Unpaved
Direction:		Thickness (mm):	0
Location/Offset:	Carriageway	Base Type:	
Cone Angle:	60 degrees	Thickness (mm):	
Zero Error (mm):	0	Surface Moisture:	Moderate
Test Date:	25/01/2010	Moisture adjustment factor:	Not adjusted



Layer Boundaries Chart



CBR Chart

Layer Properties

No.	Penetration Rate (mm/blow)	CBR (%)	Thickness (mm)	Depth to layer bottom (mm)	Position	Strength Coefficient	SN	SNC	SNP
1	100.34	2	524	524	Subgrade	--	--	--	--
2	40.33	6	192	716	Subgrade	--	--	--	--
3	19.50	13	239	955	Subgrade	--	--	--	--

Pavement Strength

	Layer Contribution		
Layer	**SN**	**SNC**	**SNP**
Surface	--	--	--
Base	--	--	--
Sub-Base	--	--	--
Subgrade	--	0.00	0.00
Pavement Strength	--	0.00	0.00

CBR Relationship:

TRL equation: $\log_{10}(CBR) = 2.48 - 1.057 \times \log_{10}(Strength)$

Report produced by .....

APPENDIX B

PHOTOGRAPHS

	**PLATE 1** The northwestern area of the site.
	**PLATE 2** The northeastern area of the site.

PLATE 3

The central area of the site, viewed from the central–eastern part of the site.

PLATE 4

The central-eastern area of the site, showing the presence of an attenuation pond.

PLATE 5

The southeastern area of the site, viewed from the southwest.

PLATE 6

The western area of the site, showing the presence of allotments, hutches and pens.

PLATE 7

The southwestern area of the site, viewed from the south.

PLATE 8

Ground conditions encountered in TP6, typical of ground conditions encountered across the site.

APPENDIX C

LABORATORY TESTING RESULTS

GEOTECHNICAL LABORATORY TESTING

Job: Park Farm, Gillingham

Job No: 4423
Client Job No: 09157

Sample Reference	Natural MC (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Passing .425mm	Modified Plasticity Index (%)	Preparation Method	Description/ Remarks
TP01 1.00m (D)	27.7	62	23	39	100.0	39	Natural	Grey silty CLAY
TP03 3.00m (D)	35.6	74	27	47	100.0	47	Natural	Grey/black silty CLAY
TP05 1.00m (D)	22.8	52	19	33	100.0	33	Natural	Brown/yellow silty slightly sandy CLAY
TP06 2.00m (D)	27.6	49	18	31	100.0	31	Natural	Brown/grey silty slightly sandy CLAY
TP07 1.50m (D)	26.6	51	18	33	100.0	33	Natural	Brown/green silty slightly sandy CLAY
TP08 2.00m (D)	24.4	58	23	35	100.0	35	Natural	Grey silty CLAY
TP11 2.00m (D)	25.4	53	19	34	100.0	34	Natural	Yellow/brown silty slightly sandy CLAY
TP12 1.50m (D)	29.0	49	17	32	100.0	32	Natural	Grey/yellow silty CLAY
TP14 1.50m (D)	22.7	63	19	44	100.0	44	Natural	Yellow/grey silty/sandy CLAY
TP15 1.00m (D)	28.2	65	21	44	100.0	44	Natural	Grey silty CLAY

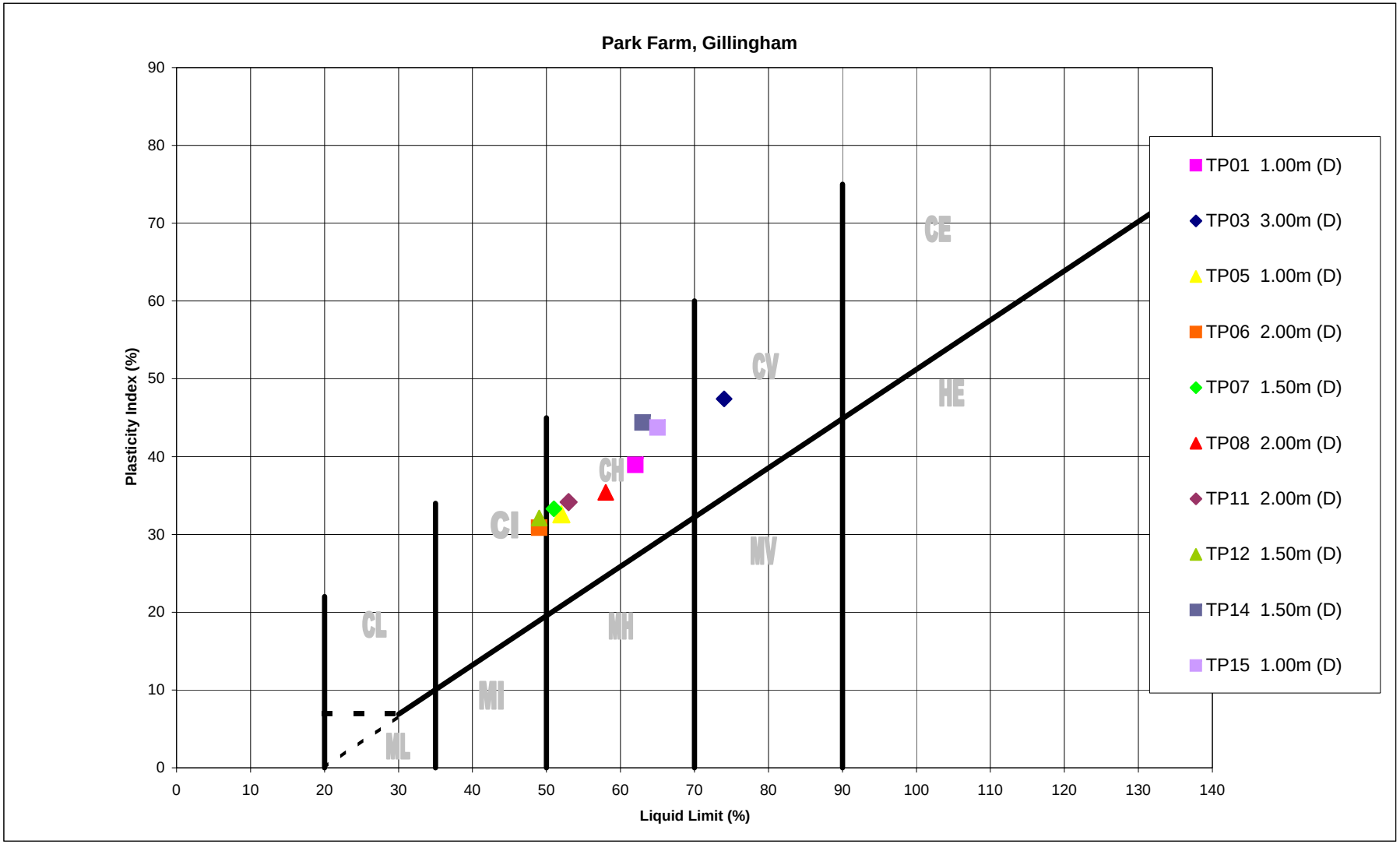
Tests carried out in accordance with Clauses 3.2, 4.3, 5.3 and 5.4 of BS1377: Part 2: 1990

Modified Plasticity Index is defined in NHBC Chapter 4.2 as the PI multiplied by the percentage of particles passing the .425mm sieve.

Non-Modified Plasticity Indices plotted on the attached Casagrande Classification chart.

Prepared By: DA Date: 29/01/2010 *Processed By:* MD Date: 05/02/2010

Tested By DA/MD Date: 01-04/02/2010 *Checked By:* Date:


Park Farm, Gillingham
Plasticity Index (%)
Liquid Limit (%)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
CE
CV
HE
CH
CI
MV
CL
MH
MI
ML
TP01 1.00m (D)
TP03 3.00m (D)
TP05 1.00m (D)
TP06 2.00m (D)
TP07 1.50m (D)
TP08 2.00m (D)
TP11 2.00m (D)
TP12 1.50m (D)
TP14 1.50m (D)
TP15 1.00m (D)

Job: Park Farm, Gillingham

Job No: 4423
Client Job No: 09157

Sample Reference	Natural MC (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Passing .425mm	Modified Plasticity Index (%)	Preparation Method	Description/ Remarks
TP15 1.00m (D)	28.2	65	21	44	100.0	44	Natural	Grey silty CLAY
TP17 2.50m (D)	27.5	60	21	39	100.0	39	Natural	Grey silty CLAY
TP18 1.00m (D)	19.6	74	25	49	100.0	49	Natural	Green silty CLAY
TP19 1.00m (D)	25.7	57	21	36	100.0	36	Natural	Brown/green silty slightly sandy CLAY

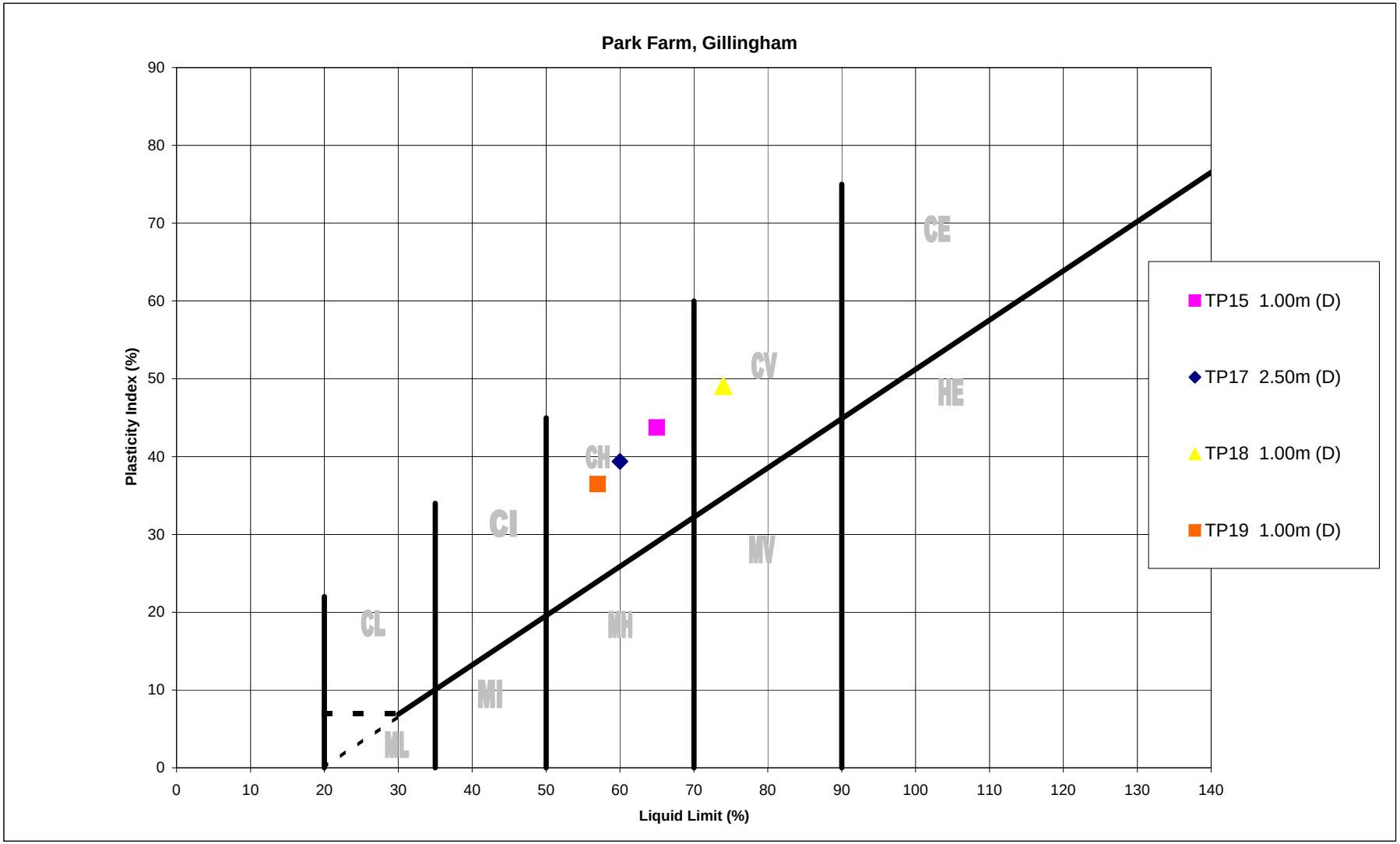
Tests carried out in accordance with Clauses 3.2, 4.3, 5.3 and 5.4 of BS1377: Part 2: 1990

Modified Plasticity Index is defined in NHBC Chapter 4.2 as the PI multiplied by the percentage of particles passing the .425mm sieve.

Non-Modified Plasticity Indices plotted on the attached Casagrande Classification chart.

Prepared By: DA Date: 29/01/2010 *Processed By:* MD Date: 05/02/2010

Tested By DA/MD Date: 01-04/02/2010 *Checked By:* Date:


Park Farm, Gillingham
Plasticity Index (%)
Liquid Limit (%)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
CE
CV
HE
CH
CI
MV
CL
MH
MI
ML
TP15 1.00m (D)
TP17 2.50m (D)
TP18 1.00m (D)
TP19 1.00m (D)

Ruddlesden geotechnical ltd

Particle Size Distribution Test Result

Job: Park Farm, Gillingham

Job No: **4423**
Client Job No: **09157**

TP04 2.50m (B)

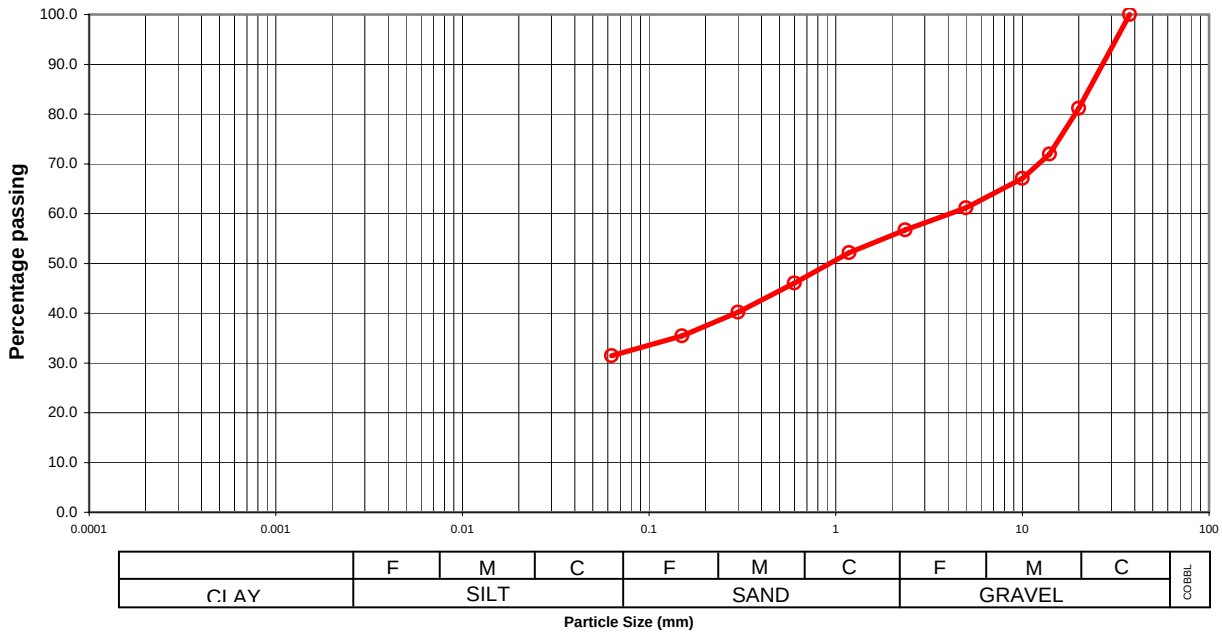
Green very clayey/silty SAND/GRAVEL

Natural moisture content = 24.4%

Uniformity Coefficient = n/a

Particle size (mm)	% Passing
37.5	100.0
20	81.2
14	71.9
10	67.0
5	61.1
2.36	56.7
1.18	52.2
0.6	46.1
0.3	40.2
0.15	35.4
0.063	31.5

Particle Size Distribution Chart



Sample tested in accordance with BS1377: 1990: Part 2: 9.2
Due to size of sample limitations, the BS 1377 recommended sample size for gravel/cobble soils cannot always be achieved.

Prepared By:	MD	Date:	29/01/2010	*Processed By:*	MD	Date:	05/02/2010
Tested By:	DA	Date:	04/02/2010	*Checked By:*		Date:	

Filename:PSD TP04 2.50m 4423 10205Sheet1

Ruddlesden geotechnical ltd

Particle Size Distribution Test Result

Job: Park Farm, Gillingham

Job No: 4423
Client Job No: 09157

TP10 1.00m (B)

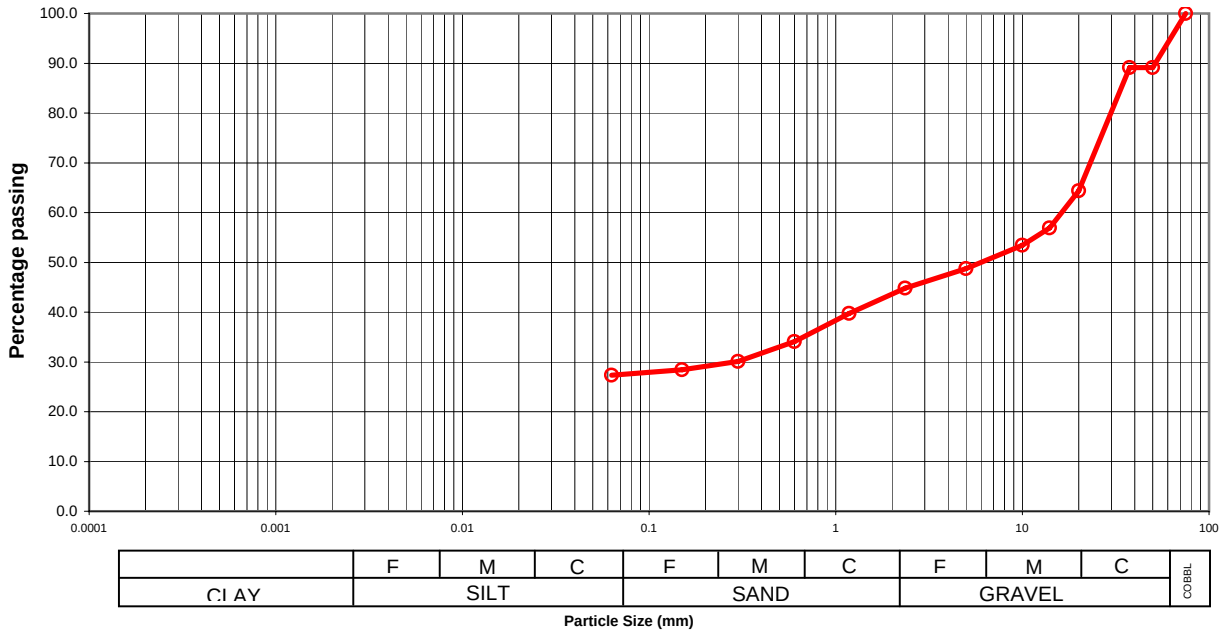
Green very clayey/silty/sandy fine to coarse GRAVEL

Natural moisture content = 12.6%

Uniformity Coefficient = n/a

Particle size (mm)	% Passing
75	100.0
50	89.1
37.5	89.1
20	64.4
14	56.9
10	53.4
5	48.8
2.36	44.8
1.18	39.7
0.6	34.1
0.3	30.1
0.15	28.4
0.063	27.3

Particle Size Distribution Chart



Sample tested in accordance with BS1377: 1990: Part 2: 9.2
Due to size of sample limitations, the BS 1377 recommended sample size for gravel/cobble soils cannot always be achieved.

Prepared By:	MD	Date:	29/01/2010	*Processed By:*	MD	Date:	05/02/2010
Tested By:	DA	Date:	04/02/2010	*Checked By:*		Date:	

Filename:PSD TP10 1.00m 4423 100205Sheet1

Ruddlesden geotechnical ltd

Particle Size Distribution Test Result

Job: Park Farm, Gillingham

Job No: 4423
Client Job No: 09157

TP13 2.00m (B)

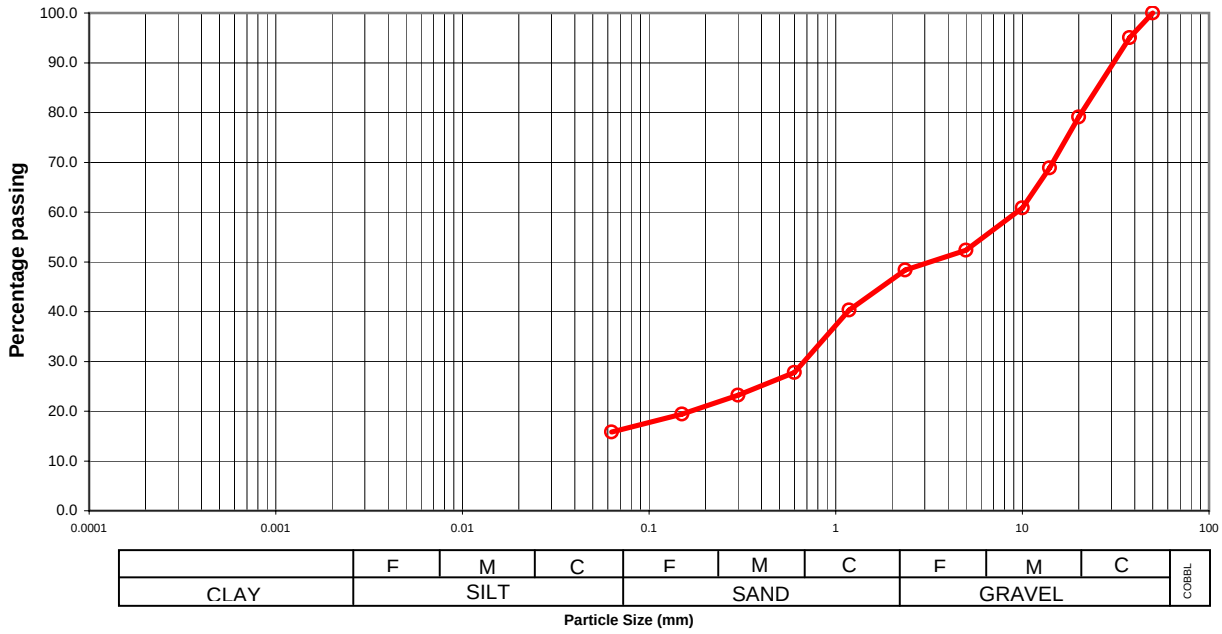
Green clayey/silty very sandy fine to coarse GRAVEL

Natural moisture content = 21.2%

Uniformity Coefficient = n/a

Particle size (mm)	% Passing
50	100.0
37.5	95.1
20	79.1
14	68.9
10	60.8
5	52.4
2.36	48.4
1.18	40.3
0.6	27.8
0.3	23.2
0.15	19.4
0.063	15.8

Particle Size Distribution Chart



Sample tested in accordance with BS1377: 1990: Part 2: 9.2
Due to size of sample limitations, the BS 1377 recommended sample size for gravel/cobble soils cannot always be achieved.

Prepared By:	MD	Date:	29/01/2010	*Processed By:*	MD	Date:	05/02/2010
Tested By:	DA	Date:	04/02/2010	*Checked By:*		Date:	

Filename:PSD TP13 2.00m 4423 100205Sheet1

Ruddlesden geotechnical ltd

Particle Size Distribution Test Result

Job: Park Farm, Gillingham

Job No: 4423
Client Job No: 09157

TP16 1.25m (B)

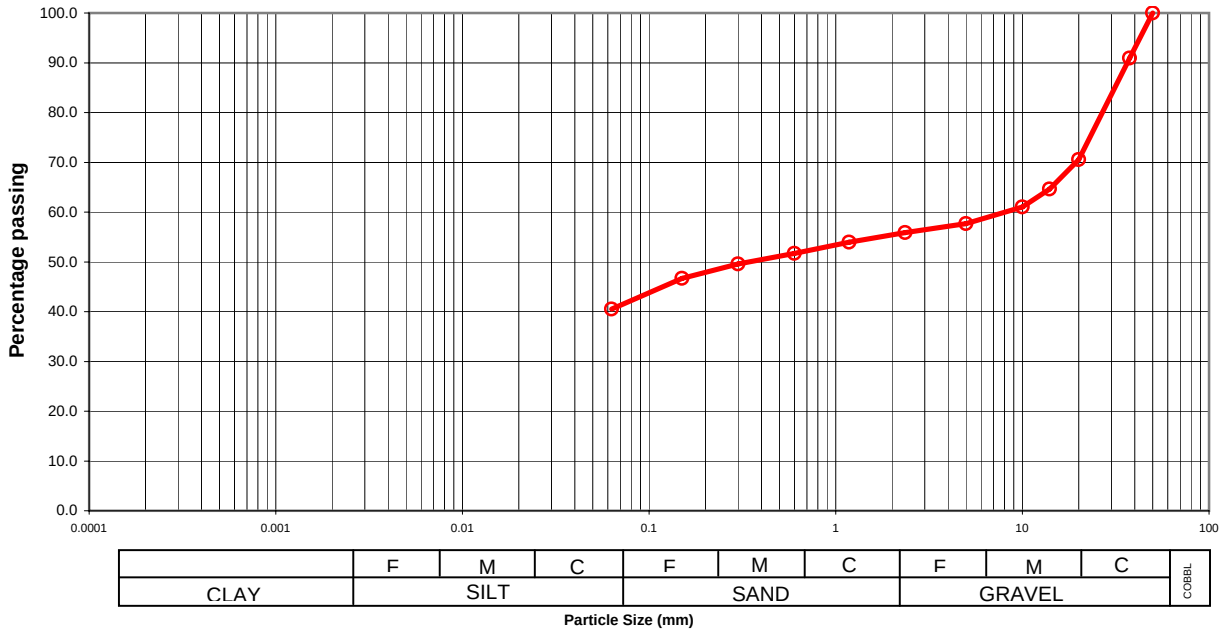
Brown/green very sandy/gravelly CLAY/SILT

Natural moisture content = 21.0%

Uniformity Coefficient = n/a

Particle size (mm)	% Passing
50	100.0
37.5	91.0
20	70.5
14	64.6
10	61.0
5	57.7
2.36	55.9
1.18	53.9
0.6	51.7
0.3	49.6
0.15	46.7
0.063	40.5

Particle Size Distribution Chart



Sample tested in accordance with BS1377: 1990: Part 2: 9.2
Due to size of sample limitations, the BS 1377 recommended sample size for gravel/cobble soils cannot always be achieved.

Prepared By:	MD	Date:	29/01/2010	*Processed By:*	MD	Date:	05/02/2010
Tested By:	DA	Date:	04/02/2010	*Checked By:*		Date:	

Filename:PSD TP16 1.25m 4423 100205Sheet1

CONTAMINATION LABORATORY TESTING

Chemtest
The right chemistry to deliver results

Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070

Ruddlesden Geotechnical Ltd
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

FAO Simon Ruddlesden
09 February 2010

Dear Simon Ruddlesden

Test Report Number **110645**
Your Project Reference **Park Farm, Gillingham - 09157**

Please find enclosed the results of analysis for the samples received 1 February 2010.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely

Authorised Signatory

☐ Darrell Hall	Laboratory Manager
☑ Phil Hellier	Operations Director
☐ Keith Jones	Technical Development Manager
☐ John Crawford	Quality Manager
☐ Malcolm Avis	Technical Director

UKAS TESTING
2183

Notes to accompany report:

- *The sign < means 'less than'*
- *Tests marked 'U' hold UKAS accreditation*
- *Tests marked 'M' hold MCertS (and UKAS) accreditation*
- *Tests marked 'N' do not currently hold UKAS accreditation*
- *Tests marked 'S' were subcontracted to an approved laboratory*
- *n/e means 'not evaluated'*
- *i/s means 'insufficient sample'*
- *u/s means 'unsuitable sample'*
- *Comments or interpretations are beyond the scope of UKAS accreditation*
- *The results relate only to the items tested*

Ruddlesden Geotechnical Ltd
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

FAO Simon Ruddlesden

LABORATORY TEST REPORT

Results of analysis of 35 samples
received 01 February 2010

Park Farm, Gillingham - 09157

Chemtest
The right chemistry to deliver results

Report Date
09 February 2010

Login Batch No					110645							
Chemtest LIMS ID					AE65041	AE65042	AE65043	AE65044	AE65045	AE65046	AE65047	AE65048
Sample ID					TP01	TP01	TP03	TP03	TP04	TP04	TP05	TP05
Sample No												
Depth					1m	1m	0.5m	3m	0.25m	2.5m	0.5m	1m
Matrix					*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*								
2625	Organic matter		%	M	1.0		1.6		1.7		1.0	
2120	Boron (hot water soluble)	7440428	mg kg-¹	M	1.4		0.8		0.8		0.5	
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	M	0.07	0.08	<0.01	0.01	0.01	0.02	<0.01	<0.01
2430	Sulfate (total)	14808798	%	M	<0.01		0.02		<0.01		<0.01	
2450	Arsenic	7440382	mg kg-¹	M	<2.0		4.3		13		9.6	
	Cadmium	7440439	mg kg-¹	M	<0.10		0.13		<0.10		0.15	
	Chromium	7440473	mg kg-¹	M	27		32		49		31	
	Copper	7440508	mg kg-¹	M	85		20		14		20	
	Mercury	7439976	mg kg-¹	M	<0.10		<0.10		<0.10		<0.10	
	Nickel	7440020	mg kg-¹	M	28		21		21		30	
	Lead	7439921	mg kg-¹	M	54		28		34		22	
	Selenium	7782492	mg kg-¹	M	<0.20		<0.20		<0.20		<0.20	
	Zinc	7440666	mg kg-¹	M	88		68		68		58	
2670	Total Petroleum Hydrocarbons		mg kg-¹	M	< 10		< 10		< 10		< 10	
2700	Naphthalene	91203	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Acenaphthylene	208968	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Acenaphthene	83329	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Fluorene	86737	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Phenanthrene	85018	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Anthracene	120127	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Fluoranthene	206440	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Pyrene	129000	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[a]anthracene	56553	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Chrysene	218019	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[b]fluoranthene	205992	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[k]fluoranthene	207089	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[a]pyrene	50328	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[g,h,i]perylene	191242	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Total (of 16) PAHs		mg kg-¹	M	< 2		< 2		< 2		< 2	

All tests undertaken between 02-Feb-2010 and 8-Feb-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

Ruddlesden Geotechnical Ltd
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

FAO Simon Ruddlesden

LABORATORY TEST REPORT

Results of analysis of 35 samples
received 01 February 2010

Park Farm, Gillingham - 09157

Chemtest
The right chemistry to deliver results

Report Date
09 February 2010

Login Batch No					**110645**								
	Chemtest LIMS ID				AE65049	AE65050	AE65051	AE65052	AE65053	AE65054	AE65055	AE65056
	Sample ID				TP06	TP06	TP07	TP07	TP08	TP08	TP10	TP10
	Sample No											
	Depth				0.25m	2m	0.5m	1.5m	0.75m	2m	0.5m	1m
	Matrix				*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*								
2625	Organic matter		%	M	0.79		0.53		0.59		0.57	
2120	Boron (hot water soluble)	7440428	mg kg-¹	M	0.5		0.4		0.6		<0.4	
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	M	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.07
2430	Sulfate (total)	14808798	%	M	<0.01		<0.01		<0.01		<0.01	
2450	Arsenic	7440382	mg kg-¹	M	16		14		14		19	
	Cadmium	7440439	mg kg-¹	M	0.36		<0.10		<0.10		0.34	
	Chromium	7440473	mg kg-¹	M	46		35		33		31	
	Copper	7440508	mg kg-¹	M	30		15		31		27	
	Mercury	7439976	mg kg-¹	M	<0.10		<0.10		<0.10		<0.10	
	Nickel	7440020	mg kg-¹	M	48		10		48		64	
	Lead	7439921	mg kg-¹	M	32		22		30		31	
	Selenium	7782492	mg kg-¹	M	<0.20		<0.20		0.32		<0.20	
	Zinc	7440666	mg kg-¹	M	83		32		98		92	
2670	Total Petroleum Hydrocarbons		mg kg-¹	M	< 10		< 10		< 10		< 10	
2700	Naphthalene	91203	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Acenaphthylene	208968	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Acenaphthene	83329	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Fluorene	86737	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Phenanthrene	85018	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Anthracene	120127	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Fluoranthene	206440	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Pyrene	129000	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[a]anthracene	56553	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Chrysene	218019	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[b]fluoranthene	205992	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[k]fluoranthene	207089	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[a]pyrene	50328	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[g,h,i]perylene	191242	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Total (of 16) PAHs		mg kg-¹	M	< 2		< 2		< 2		< 2	

All tests undertaken between 02-Feb-2010 and 8-Feb-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

Ruddlesden Geotechnical Ltd
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

FAO Simon Ruddlesden

LABORATORY TEST REPORT

Results of analysis of 35 samples
received 01 February 2010

Park Farm, Gillingham - 09157

Chemtest
The right chemistry to deliver results

Report Date
09 February 2010

Login Batch No					**110645**								
	Chemtest LIMS ID				AE65057	AE65058	AE65059	AE65060	AE65061	AE65062	AE65063	AE65064
	Sample ID				TP11	TP11	TP12	TP12	TP13	TP13	TP14	TP14
	Sample No											
	Depth				0.25m	2m	0.75m	1.5m	1m	2m	0.25m	1.5m
	Matrix				*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*								
2625	Organic matter		%	M	0.48		1.1		4.7		1.0	
2120	Boron (hot water soluble)	7440428	mg kg-¹	M	<0.4		1.0		1.3		<0.4	
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	M	<0.01	<0.01	0.10	0.24	0.06	0.03	<0.01	0.01
2430	Sulfate (total)	14808798	%	M	<0.01		<0.01		<0.01		0.02	
2450	Arsenic	7440382	mg kg-¹	M	23		13		72		7.0	
	Cadmium	7440439	mg kg-¹	M	0.44		0.50		1.3		<0.10	
	Chromium	7440473	mg kg-¹	M	30		44		150		34	
	Copper	7440508	mg kg-¹	M	26		38		380		13	
	Mercury	7439976	mg kg-¹	M	<0.10		<0.10		0.38		<0.10	
	Nickel	7440020	mg kg-¹	M	62		68		180		15	
	Lead	7439921	mg kg-¹	M	27		32		240		28	
	Selenium	7782492	mg kg-¹	M	0.31		<0.20		<0.20		<0.20	
	Zinc	7440666	mg kg-¹	M	90		94		400		51	
2670	Total Petroleum Hydrocarbons		mg kg-¹	M	< 10		< 10		< 10		< 10	
2700	Naphthalene	91203	mg kg-¹	M	< 0.1		< 0.1		0.41		< 0.1	
	Acenaphthylene	208968	mg kg-¹	M	< 0.1		< 0.1		12		< 0.1	
	Acenaphthene	83329	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Fluorene	86737	mg kg-¹	M	< 0.1		< 0.1		5.3		< 0.1	
	Phenanthrene	85018	mg kg-¹	M	< 0.1		< 0.1		1.1		< 0.1	
	Anthracene	120127	mg kg-¹	M	< 0.1		< 0.1		0.42		< 0.1	
	Fluoranthene	206440	mg kg-¹	M	< 0.1		< 0.1		0.65		< 0.1	
	Pyrene	129000	mg kg-¹	M	< 0.1		< 0.1		0.43		< 0.1	
	Benzo[a]anthracene	56553	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Chrysene	218019	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[b]fluoranthene	205992	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[k]fluoranthene	207089	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[a]pyrene	50328	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Benzo[g,h,i]perylene	191242	mg kg-¹	M	< 0.1		< 0.1		< 0.1		< 0.1	
	Total (of 16) PAHs		mg kg-¹	M	< 2		< 2		20		< 2	

All tests undertaken between 02-Feb-2010 and 8-Feb-2010

* Accreditation status

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Ruddlesden Geotechnical Ltd
65 Langaton Lane
Pinhoe
Exeter
EX1 3SP

FAO Simon Ruddlesden

LABORATORY TEST REPORT

Results of analysis of 35 samples
received 01 February 2010

Park Farm, Gillingham - 09157

Chemtest
The right chemistry to deliver results

Report Date
09 February 2010

Login Batch No					**110645**								
Chemtest LIMS ID					AE65065	AE65066	AE65067	AE65068	AE65069	AE65070	AE65071	AE65072
Sample ID					TP15	TP15	TP16	TP16	TP17	TP17	TP17	TP18
Sample No												
Depth					0.5m	1m	0.3m	1.25m	0.5m	1m	2.5m	0.5m
Matrix					*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*								
2625	Organic matter		%	M	0.95		0.98		3.3	2.8		2.1
2120	Boron (hot water soluble)	7440428	mg kg-¹	M	0.6		<0.4		0.5	<0.4		<0.4
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	M	0.02	0.10	<0.01	0.03	0.14	0.04	0.22	0.24
2430	Sulfate (total)	14808798	%	M	<0.01		<0.01		0.04	0.05		0.19
2450	Arsenic	7440382	mg kg-¹	M	8.7		10		13	4.6		7.2
	Cadmium	7440439	mg kg-¹	M	0.63		<0.10		<0.10	<0.10		<0.10
	Chromium	7440473	mg kg-¹	M	39		32		23	27		30
	Copper	7440508	mg kg-¹	M	31		15		13	11		22
	Mercury	7439976	mg kg-¹	M	<0.10		<0.10		<0.10	<0.10		<0.10
	Nickel	7440020	mg kg-¹	M	44		15		24	17		36
	Lead	7439921	mg kg-¹	M	30		21		26	25		38
	Selenium	7782492	mg kg-¹	M	<0.20		<0.20		<0.20	<0.20		<0.20
	Zinc	7440666	mg kg-¹	M	120		46		81	92		82
2670	Total Petroleum Hydrocarbons		mg kg-¹	M	< 10		< 10		< 10	< 10		< 10
2700	Naphthalene	91203	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Acenaphthylene	208968	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Acenaphthene	83329	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Fluorene	86737	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Phenanthrene	85018	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.15
	Anthracene	120127	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Fluoranthene	206440	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.31
	Pyrene	129000	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.25
	Benzo[a]anthracene	56553	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.3
	Chrysene	218019	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.23
	Benzo[b]fluoranthene	205992	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.14
	Benzo[k]fluoranthene	207089	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Benzo[a]pyrene	50328	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		0.17
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Benzo[g,h,i]perylene	191242	mg kg-¹	M	< 0.1		< 0.1		< 0.1	< 0.1		< 0.1
	Total (of 16) PAHs		mg kg-¹	M	< 2		< 2		< 2	< 2		< 2

All tests undertaken between 02-Feb-2010 and 8-Feb-2010

* Accreditation status

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Pinhoe
Exeter
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FAO Simon Ruddlesden

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Park Farm, Gillingham - 09157

Chemtest
The right chemistry to deliver results

Report Date
09 February 2010

					Login Batch No		
					110645		
					AE65073	AE65074	AE65075
Chemtest LIMS ID							
Sample ID					TP18	TP19	TP19
Sample No							
Depth					1m	0.5m	1m
Matrix					*SOIL*	*SOIL*	*SOIL*
SOP↓	Determinand↓	CAS No↓	Units↓	*			
2625	Organic matter		%	M		2.4	
2120	Boron (hot water soluble)	7440428	mg kg-¹	M		1.0	
	Sulfate (2:1 water soluble) as SO4	14808798	g l-¹	M	0.13	0.03	0.05
2430	Sulfate (total)	14808798	%	M		0.02	
2450	Arsenic	7440382	mg kg-¹	M		4.2	
	Cadmium	7440439	mg kg-¹	M		<0.10	
	Chromium	7440473	mg kg-¹	M		35	
	Copper	7440508	mg kg-¹	M		15	
	Mercury	7439976	mg kg-¹	M		<0.10	
	Nickel	7440020	mg kg-¹	M		23	
	Lead	7439921	mg kg-¹	M		24	
	Selenium	7782492	mg kg-¹	M		<0.20	
	Zinc	7440666	mg kg-¹	M		57	
2670	Total Petroleum Hydrocarbons		mg kg-¹	M		< 10	
2700	Naphthalene	91203	mg kg-¹	M		< 0.1	
	Acenaphthylene	208968	mg kg-¹	M		< 0.1	
	Acenaphthene	83329	mg kg-¹	M		< 0.1	
	Fluorene	86737	mg kg-¹	M		< 0.1	
	Phenanthrene	85018	mg kg-¹	M		< 0.1	
	Anthracene	120127	mg kg-¹	M		< 0.1	
	Fluoranthene	206440	mg kg-¹	M		< 0.1	
	Pyrene	129000	mg kg-¹	M		< 0.1	
	Benzo[a]anthracene	56553	mg kg-¹	M		< 0.1	
	Chrysene	218019	mg kg-¹	M		< 0.1	
	Benzo[b]fluoranthene	205992	mg kg-¹	M		< 0.1	
	Benzo[k]fluoranthene	207089	mg kg-¹	M		< 0.1	
	Benzo[a]pyrene	50328	mg kg-¹	M		< 0.1	
	Dibenzo[a,h]anthracene	53703	mg kg-¹	M		< 0.1	
	Indeno[1,2,3-cd]pyrene	193395	mg kg-¹	M		< 0.1	
	Benzo[g,h,i]perylene	191242	mg kg-¹	M		< 0.1	
	Total (of 16) PAHs		mg kg-¹	M		< 2	

All tests undertaken between 02-Feb-2010 and 8-Feb-2010

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Report Date
09 February 2010

					110645							
					AE65041	AE65042	AE65043	AE65044	AE65045	AE65046	AE65047	AE65048
					TP01	TP01	TP03	TP03	TP04	TP04	TP05	TP05
					1m	1m	0.5m	3m	0.25m	2.5m	0.5m	1m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2920	Phenols (total)		mg kg^{-1}	N	<0.3		<0.3		<0.3		<0.3	
2010	pH		-	M	7.7	7.6	6.0	6.4	6.5	7.8	7.6	7.6

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					110645							
					AE65049	AE65050	AE65051	AE65052	AE65053	AE65054	AE65055	AE65056
					TP06	TP06	TP07	TP07	TP08	TP08	TP10	TP10
					0.25m	2m	0.5m	1.5m	0.75m	2m	0.5m	1m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2920	Phenols (total)		mg kg-¹	N	<0.3		<0.3		<0.3		<0.3	
2010	pH		-	M	7.7	7.9	7.8	8.1	7.8	7.8	7.7	8.0

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					110645							
					AE65057	AE65058	AE65059	AE65060	AE65061	AE65062	AE65063	AE65064
					TP11	TP11	TP12	TP12	TP13	TP13	TP14	TP14
					0.25m	2m	0.75m	1.5m	1m	2m	0.25m	1.5m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2920	Phenols (total)		mg kg-¹	N	<0.3		<0.3		<0.3		<0.3	
2010	pH		-	M	7.9	8.0	8.0	8.0	7.6	7.9	6.7	5.6

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					110645							
					AE65065	AE65066	AE65067	AE65068	AE65069	AE65070	AE65071	AE65072
					TP15	TP15	TP16	TP16	TP17	TP17	TP17	TP18
					0.5m	1m	0.3m	1.25m	0.5m	1m	2.5m	0.5m
					SOIL	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
2920	Phenols (total)		mg kg-¹	N	<0.3		<0.3		<0.3	<0.3		<0.3
2010	pH		-	M	7.7	8.0	7.6	7.8	7.7	7.5	8.0	7.7

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Report Date
09 February 2010

					110645		
					AE65073	AE65074	AE65075
					TP18	TP19	TP19
					1m	0.5m	1m
					SOIL	*SOIL*	*SOIL*
2920	Phenols (total)		mg kg-¹	N		<0.3	
2010	pH		-	M	7.9	7.5	8.2

All tests undertaken between 02-Feb-2010 and 8-Feb-2010

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Generic Assessment Criteria (GAC)
Residential Land Use

Determinand	Unit	GAC	Highest Recorded Value	Location of Highest Recorded Value	No. of values exceeding GAC	Source of GAC
Boron (water soluble)	mg/kg	291	1.4	TP01	0 of 18	LQM/ CIEH
Sulphate (2:1 extract)	g/l	1.2	0.24	TP12	0 of 35	BRE
Sulphate (total)	%	2.0	0.19	TP18	0 of 18	ICRCL
Arsenic	*mg/kg*	*32*	*72*	*TP13*	*1 of 18*	*SGV*
Cadmium	mg/kg	10	1.3	TP13	0 of 18	SGV
Chromium	mg/kg	3000	150	TP13	0 of 18	LQM/ CIEH
Copper	mg/kg	2330	380	TP13	0 of 18	LQM/ CIEH
Mercury	mg/kg	1	0.38	TP13	0 of 18	SGV
Nickel	*mg/kg*	*130*	*180*	*TP13*	*1 of 18*	*SGV*
Lead	mg/kg	450	240	TP13	0 of 18	SGV (OLD)
Selenium	mg/kg	350	0.32	TP08	0 of 18	SGV
Zinc	mg/kg	3750	400	TP13	0 of 18	LQM/ CIEH
Total TPH	mg/kg	50	10	All	0 of 18	DUTCH
Naphthalene	mg/kg	1% SOM: 1.5; 2.5% SOM: 3.7; 6% SOM: 8.7	0.41	TP13	0 of 18	LQM/ CIEH
Acenaphthylene	mg/kg	1% SOM: 170; 2.5% SOM: 400; 6% SOM: 850	12	TP13	0 of 18	LQM/ CIEH
Acenaphthene	mg/kg	1% SOM: 210; 2.5% SOM: 480; 6% SOM: 1000	0.1	All	0 of 18	LQM/ CIEH
Fluorene	mg/kg	1% SOM: 160; 2.5% SOM: 380; 6% SOM: 780	5.3	TP13	0 of 18	LQM/ CIEH
Phenanthrene	mg/kg	1% SOM: 92; 2.5% SOM: 200; 6% SOM: 380	1.1	TP13	0 of 18	LQM/ CIEH
Anthracene	mg/kg	1% SOM: 2300; 2.5% SOM: 4900; 6% SOM: 9200	0.42	TP13	0 of 18	LQM/ CIEH
Fluoranthene	mg/kg	1% SOM: 260; 2.5% SOM: 460; 6% SOM: 670	0.65	TP13	0 of 18	LQM/ CIEH
Pyrene	mg/kg	1% SOM: 560; 2.5% SOM: 1000; 6% SOM: 1600	0.43	TP13	0 of 18	LQM/ CIEH
Benzo(a)anthracene	mg/kg	1% SOM: 3.1; 2.5% SOM: 4.7; 6% SOM: 5.9	0.3	TP18	0 of 18	LQM/ CIEH
Chrysene	mg/kg	1% SOM: 6.0; 2.5% SOM: 8.0; 6% SOM: 9.3	0.23	TP18	0 of 18	LQM/ CIEH
Benzo(b)fluoranthene	mg/kg	1% SOM: 5.6; 2.5% SOM: 6.5; 6% SOM: 7.0	0.14	TP18	0 of 18	LQM/ CIEH
Benzo(k)fluoranthene	mg/kg	1% SOM: 8.5; 2.5% SOM: 9.6; 6% SOM: 10	0.1	All	0 of 18	LQM/ CIEH
Benzo(a)pyrene	mg/kg	1% SOM: 0.83; 2.5% SOM: 0.94; 6% SOM: 1.0	0.17	TP18	0 of 18	LQM/ CIEH
Dibenzo(a,h) anthracene	mg/kg	1% SOM: 0.76; 2.5% SOM: 0.86; 6% SOM: 0.90	0.1	All	0 of 18	LQM/ CIEH

Indeno(1,2,3-cd)pyrene	mg/kg	1% SOM: 3.2	2.5% SOM: 3.9	6% SOM: 4.2	0.1	All	0 of 18	LQM/ CIEH
Benzo(g,h,i)perylene	mg/kg	1% SOM: 44	2.5% SOM: 46	6% SOM: 47	0.1	All	0 of 18	LQM/ CIEH
Phenols (total)	mg/kg	420			0.3	All	0 of 18	SGV
pH (less than)	-	5.5			5.6	TP14	0 of 18	BRE

Generic Assessment Criteria (GAC) Notes:

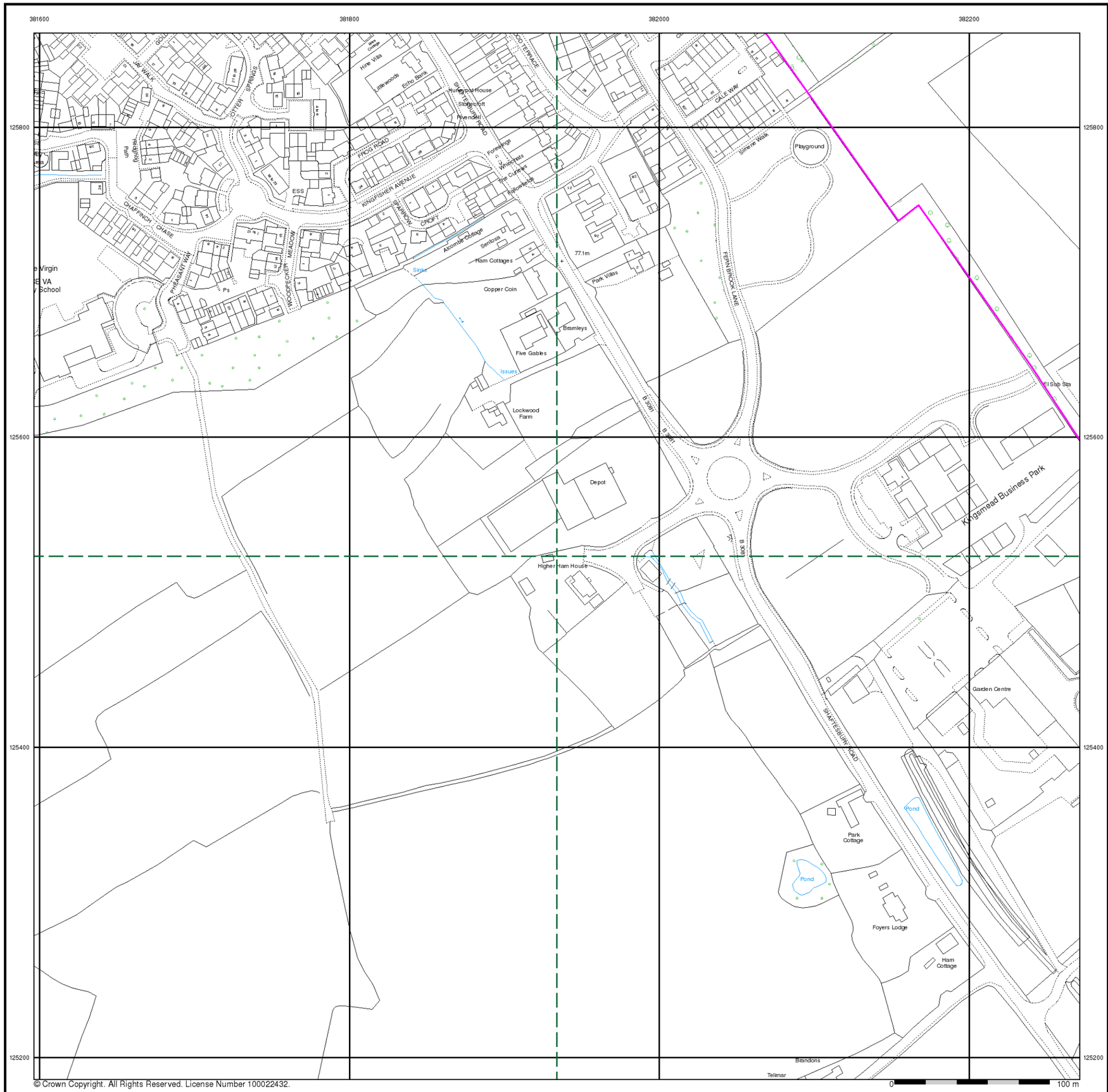
1. *Italic* entries indicate GAC exceeded.
2. Based on a sandy loam soil and 6% SOM (unless otherwise stated), in accordance with Environment Agency guidance.
3. Values are rounded to one or two significant figures.

Key:

1. SGV = Soil Guideline Value
2. SGV (OLD) = Old Soil Guideline Value (used in the absence of a replacement)
3. LQM/CIEH = Land Quality Management/ Chartered Institute of Environmental Health
4. BRE = Building Research Establishment (Special Digest 1)
5. ICRCL = Inter-Departmental Committee on the Redevelopment of Contaminated Land
6. DUTCH = Dutch Value

APPENDIX D

LANDMARK ENVIROCHECK REPORT



Ruddlesden geotechnical ltd

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

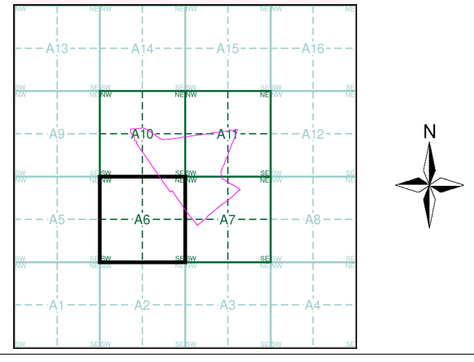
Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Segment A6



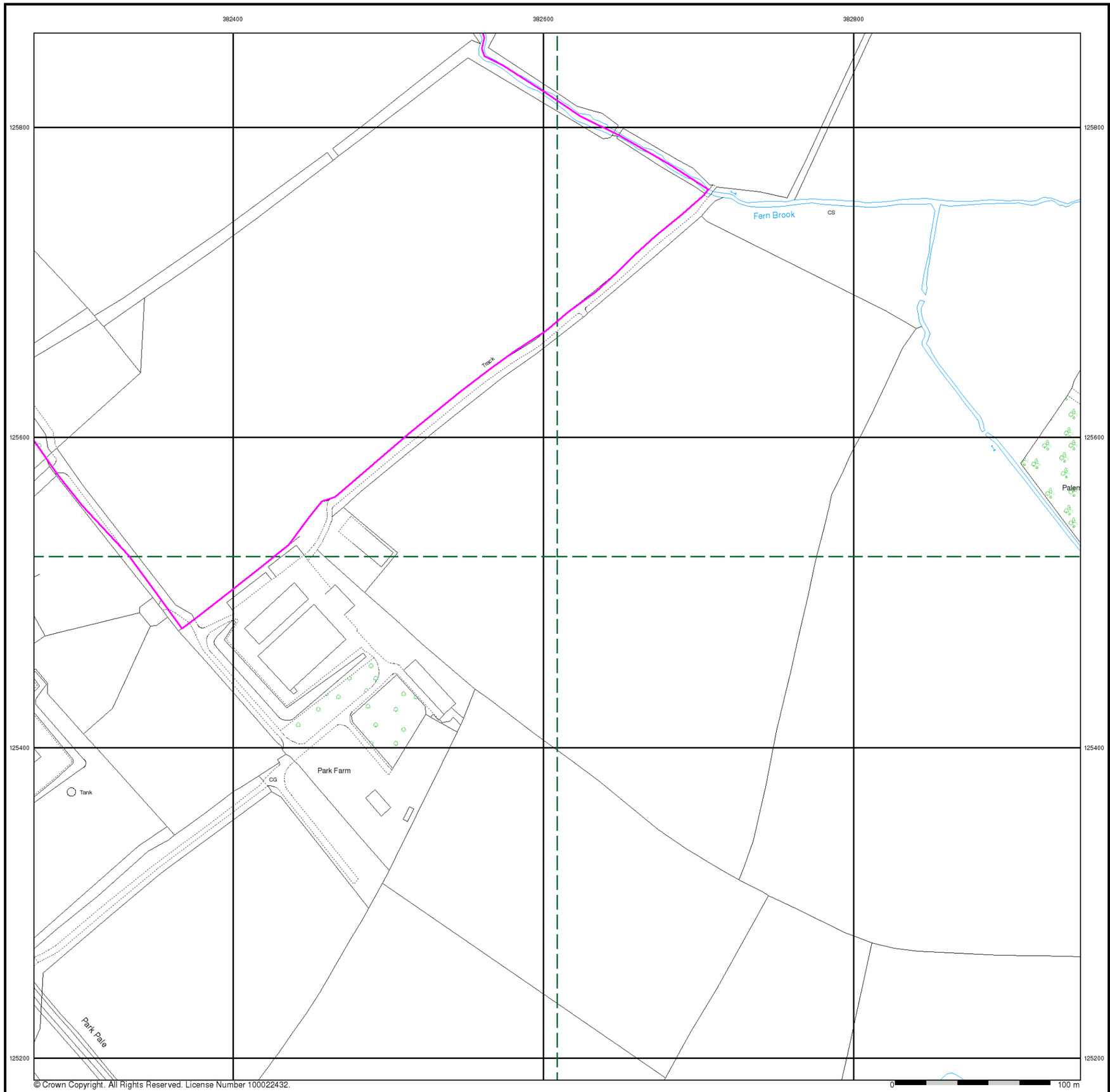
Order Details

Order Number:	27379922_1_1
Customer Ref:	09157
National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Plot Buffer (m):	0

Site Details

Land at Park Farm, Gillingham, Dorset

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



Ruddlesden geotechnical ltd

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
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- Enforcement or Prohibition Notice
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- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
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Waste

- BGS Recorded Landfill Site (Location)
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- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Geological

- BGS Recorded Mineral Site

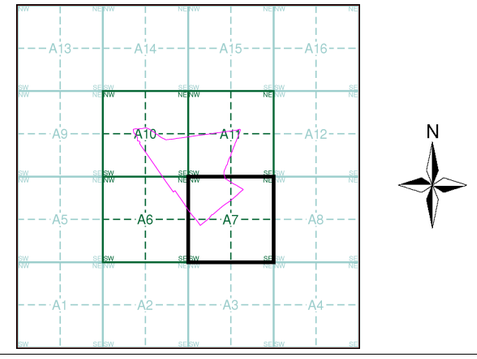
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Segment A7



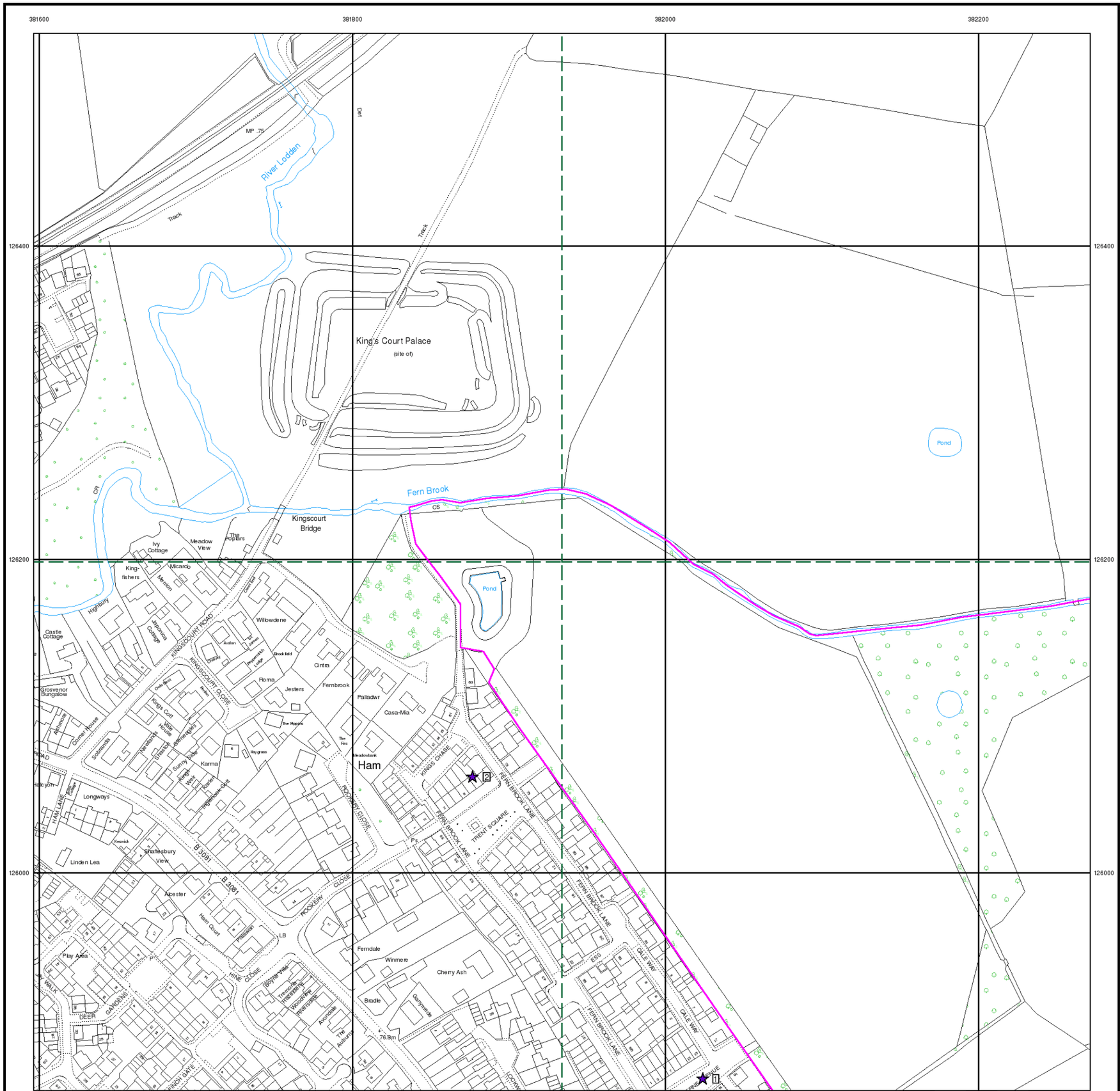
Order Details

Order Number:	27379922_1_1
Customer Ref:	09157
National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Plot Buffer (m):	0

Site Details

Land at Park Farm, Gillingham, Dorset

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



Ruddlesden geotechnical ltd

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

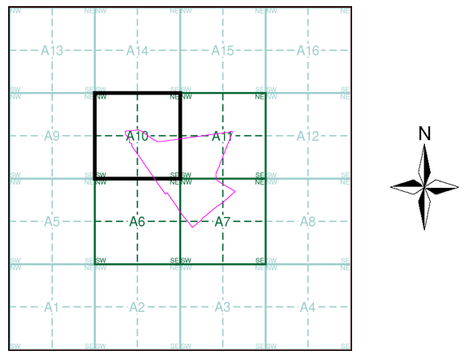
Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Segment A10



Order Details

Order Number:	27379922_1_1
Customer Ref:	09157
National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Plot Buffer (m):	0

Site Details

Land at Park Farm, Gillingham, Dorset

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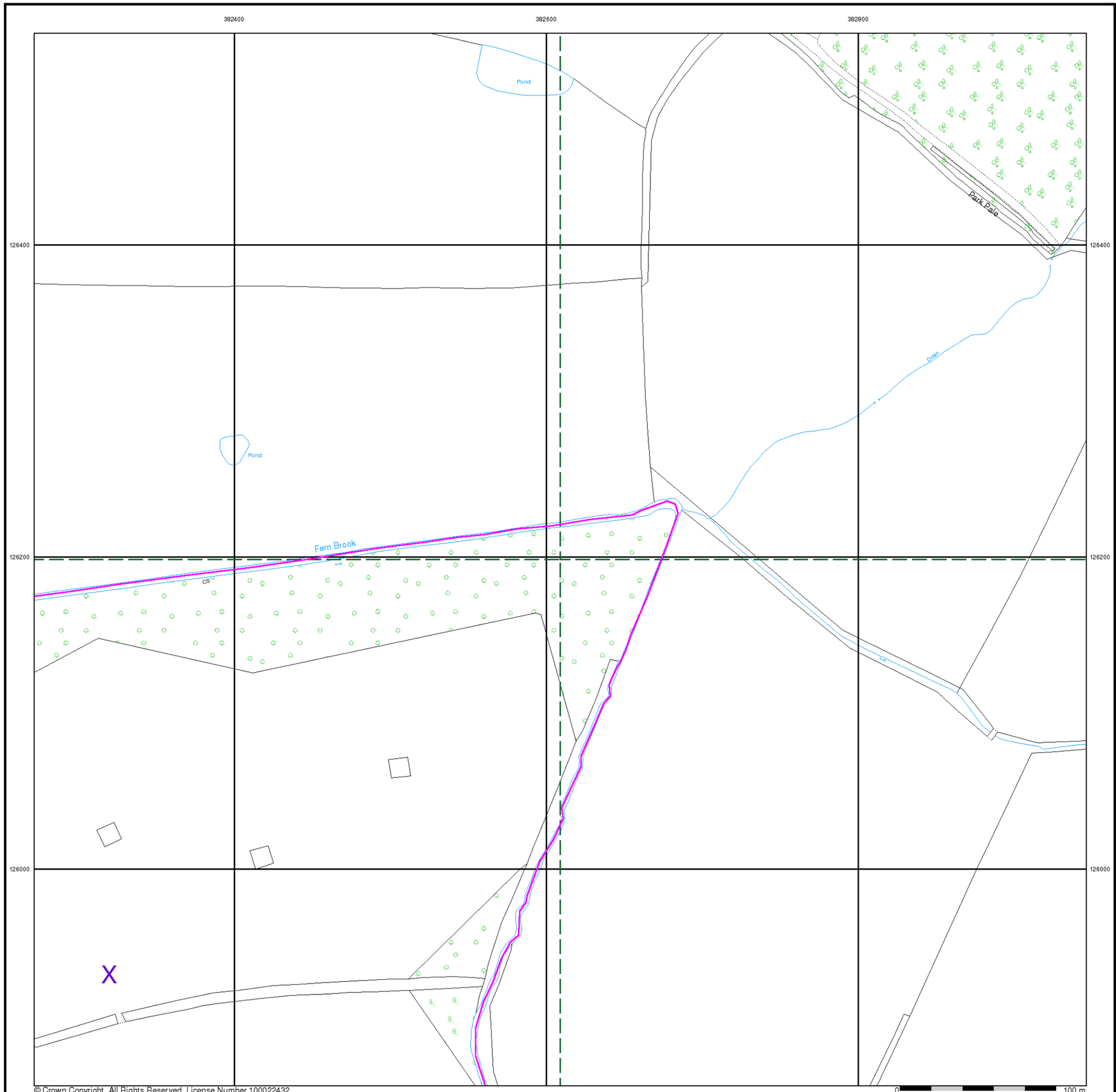

Ruddlesden geotechnical ltd

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
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- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
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- Local Authority Recorded Landfill Site
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Geological

- BGS Recorded Mineral Site

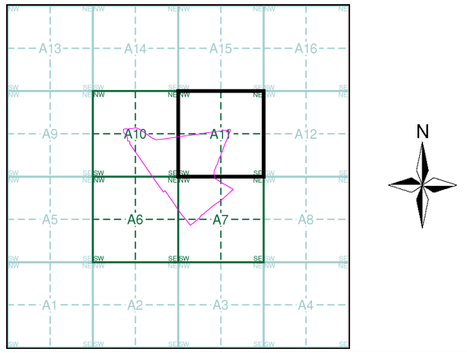
Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Segment A11



Order Details

Order Number:	27379922_1_1
Customer Ref:	09157
National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Plot Buffer (m):	0

Site Details

Land at Park Farm, Gillingham, Dorset

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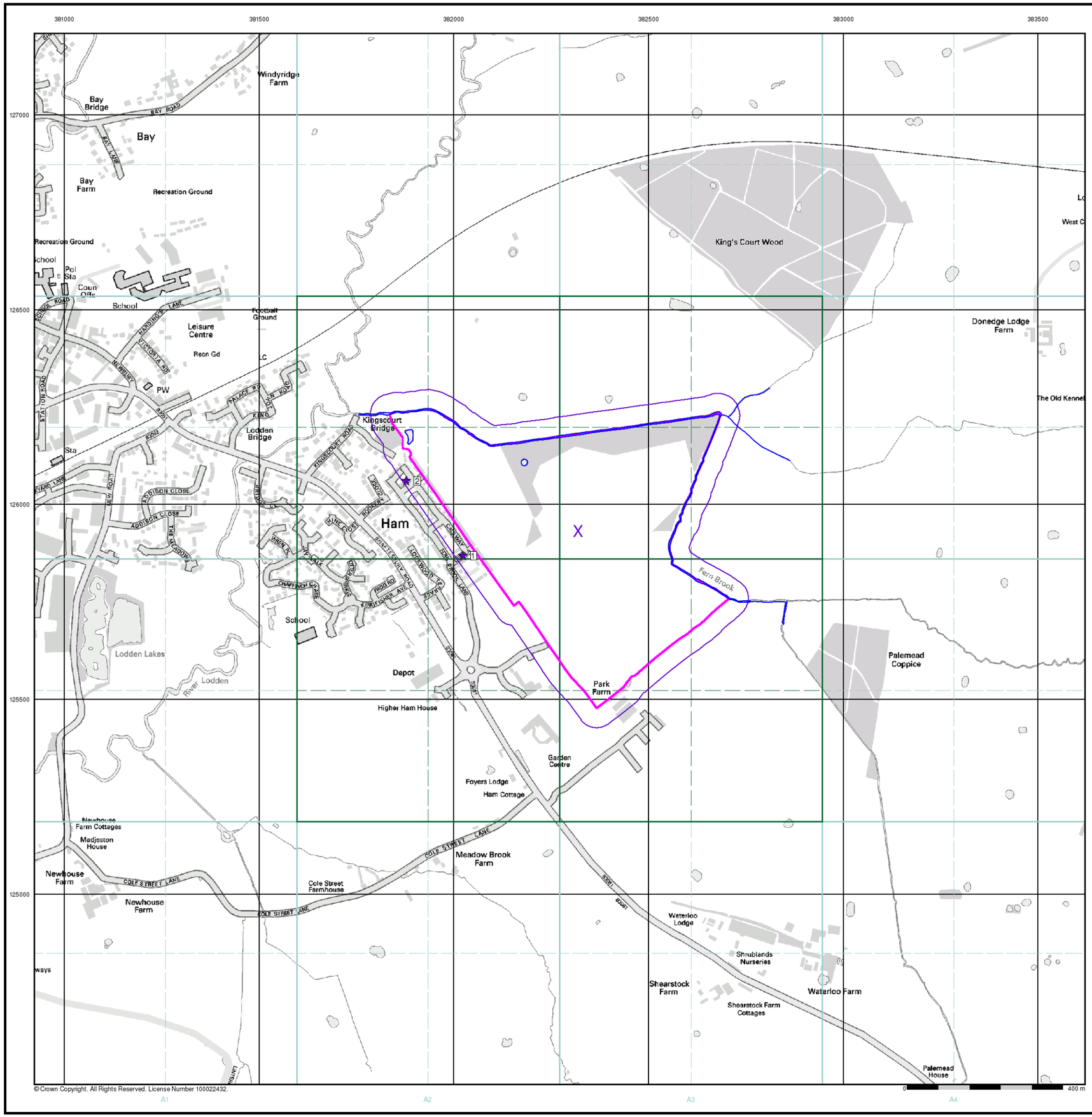

Ruddlesden geotechnical ltd

General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Geological

- BGS Recorded Mineral Site

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
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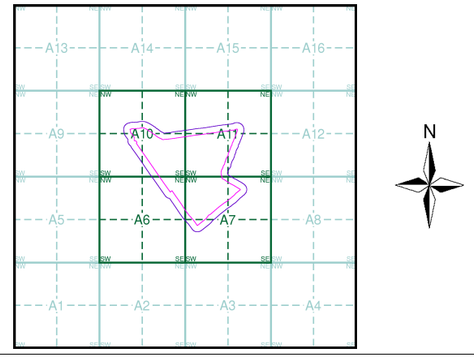
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

Site Sensitivity Map - Slice A



Order Details

Order Number:	27379922_1_1
Customer Ref:	09157
National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Search Buffer (m):	50

Site Details

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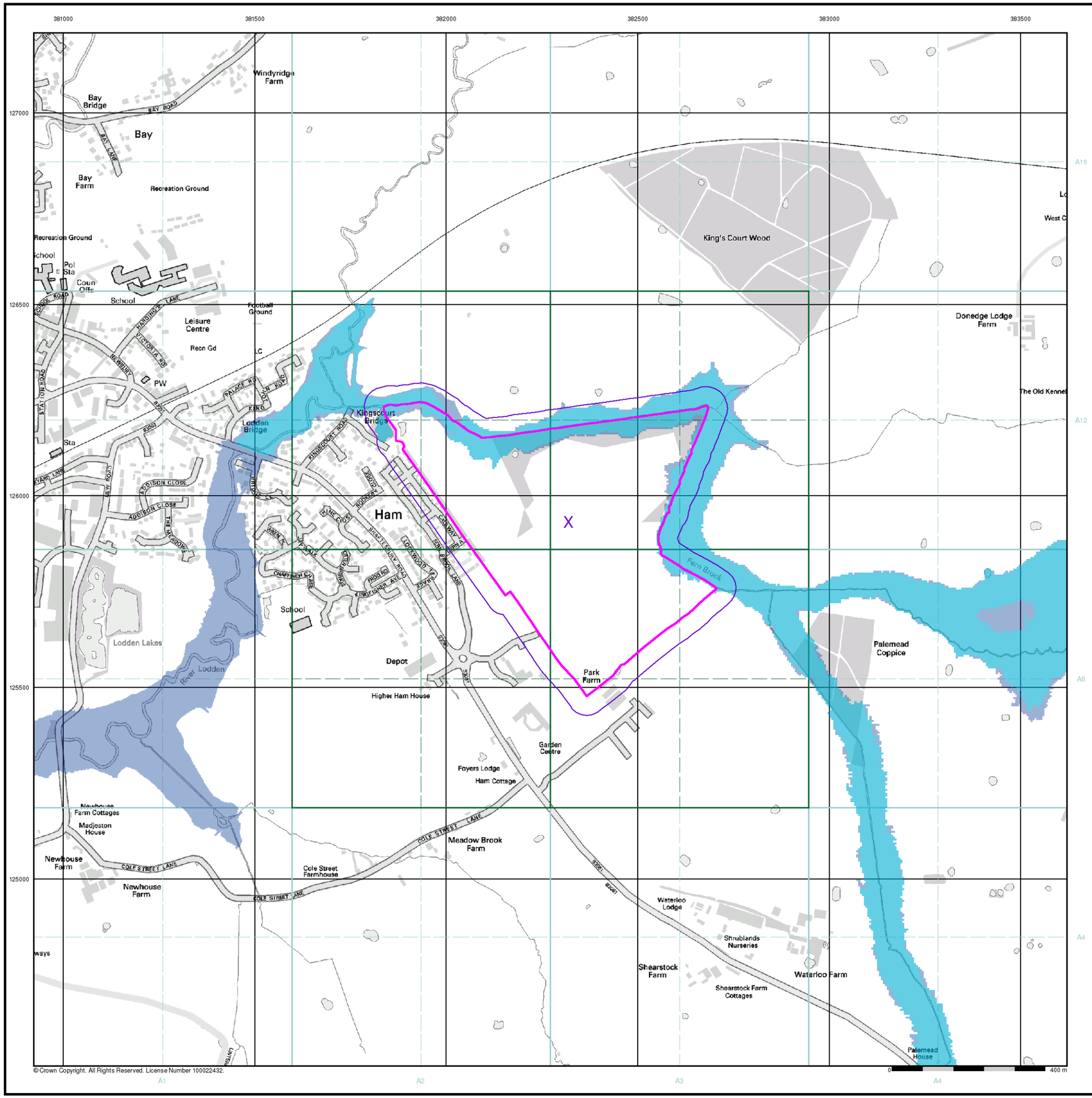


Ruddlesden geotechnical ltd

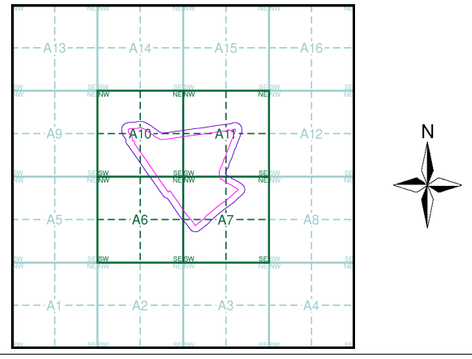
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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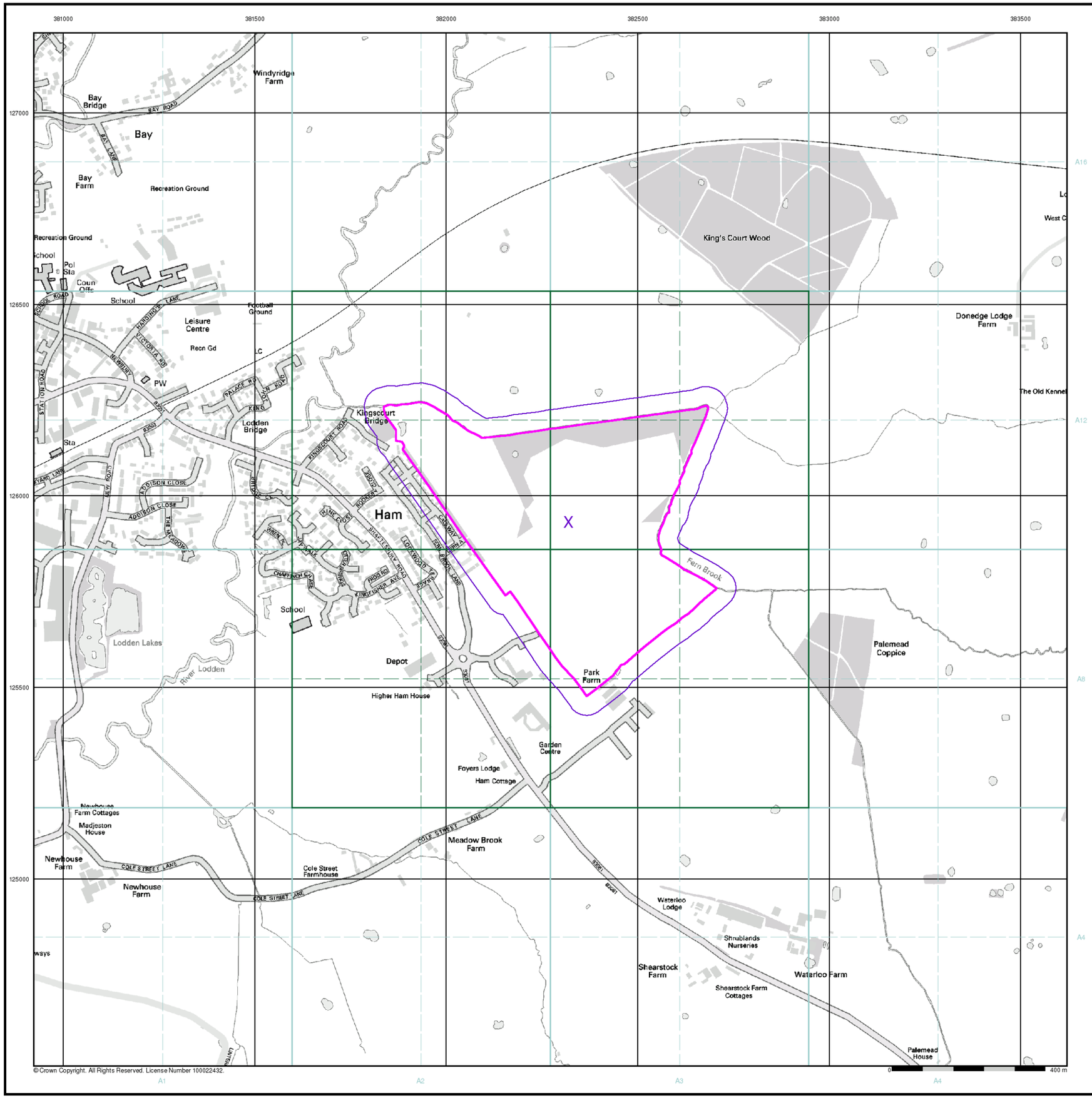


Ruddlesden geotechnical ltd

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point
- Map ID
- Several of Type at Location

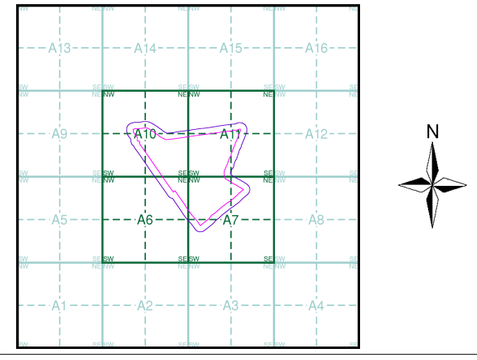
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



Order Details

Order Number:	27379922_1_1
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National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Search Buffer (m):	50

Site Details

Land at Park Farm, Gillingham, Dorset

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Historical Mapping Legends

Ordnance Survey County Series 1:10,560

Gravel Pit
Sand Pit
Other Pits
Quarry
Shingle
Orchard
Osiers
Reeds
Marsh
Mixed Wood
Deciduous
Brushwood
Fir
Furze
Rough Pasture
Arrow denotes flow of water
Trigonometrical Station
Site of Antiquities
Bench Mark
Pump, Guide Post, Signal Post
Well, Spring, Boundary Post
·285 Surface Level
Sketched Contour
Instrumental Contour
Main Roads
Fenced
Un-Fenced
Minor Roads
Fenced
Un-Fenced
Sunken Road
Raised Road
Road over Railway
Railway over River
Railway over Road
Level Crossing
Road over River or Canal
Road over Stream
Road over Stream
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)
R.D. Bdy. Rural District Boundary
Civil Parish Boundary

Ordnance Survey Plan 1:10,000

Chalk Pit, Clay Pit or Quarry
Gravel Pit
Sand Pit
Disused Pit or Quarry
Refuse or Slag Heap
Lake, Loch or Pond
Dunes
Boulders
Coniferous Trees
Non-Coniferous Trees
Orchard
Scrub
Coppice
Bracken
Heath
Rough Grassland
Marsh
Reeds
Saltings
Building
Direction of Flow of Water
Shingle
Sand
Glasshouse
Pylon
Pylon
Electricity Transmission Line
Sloping Masonry
Cutting
Embankment
Standard Gauge Multiple Track
Road Under
Road Over
Level Crossing
Foot Bridge
Standard Gauge Single Track
Siding, Tramway or Mineral Line
Narrow Gauge
Geographical County
Administrative County, County Borough or County of City
Municipal Borough, Urban or Rural District, Burgh or District Council
Borough, Burgh or County Constituency
Shown only when not coincident with other boundaries
Civil Parish
Shown alternately when coincidence of boundaries occurs

BP, BS	Boundary Post or Stone	Pol Sta	Police Station
Ch	Church	PO	Post Office
CH	Club House	PC	Public Convenience
F E Sta	Fire Engine Station	PH	Public House
FB	Foot Bridge	SB	Signal Box
Fn	Fountain	Spr	Spring
GP	Guide Post	TCB	Telephone Call Box
MP	Mile Post	TCP	Telephone Call Post
MS	Mile Stone	W	Well

1:10,000 Raster Mapping

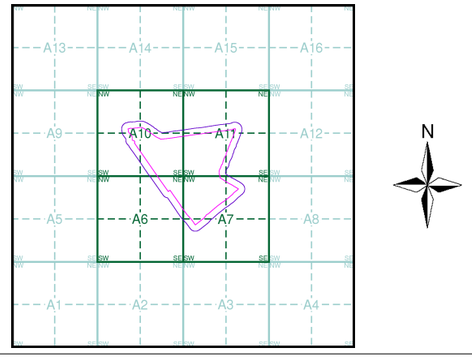
Gravel Pit
Refuse tip or slag heap
Rock
Rock (scattered)
Boulders
Boulders (scattered)
Shingle
Mud
Sand
Sand Pit
Slopes
Top of cliff
General detail
Underground detail
Overhead detail
Narrow gauge railway
Multi-track railway
Single track railway
County boundary (England only)
Civil, parish or community boundary
District, Unitary, Metropolitan, London Borough boundary
Constituency boundary
Area of wooded vegetation
Non-coniferous trees
Non-coniferous trees (scattered)
Coniferous trees
Coniferous trees (scattered)
Positioned tree
Orchard
Coppice or Osiers
Rough Grassland
Heath
Scrub
Marsh, Salt Marsh or Reeds
Water feature
Flow arrows
MHW(S) Mean high water (springs)
MLW(S) Mean low water (springs)
Telephone line (where shown)
Electricity transmission line (with poles)
BM 123.45 m Bench mark (where shown)
Triangulation station
Point feature (e.g. Guide Post or Mile Stone)
Pylon, flare stack or lighting tower
Site of (antiquity)
Glasshouse
General Building
Important Building

Ruddlesden geotechnical ltd

Historical Mapping & Photography included:

Mapping Type	Scale	Date	Pg
Dorset	1:10,560	1886	2
Wiltshire	1:10,560	1890	3
Dorset	1:10,560	1902	4
Dorset	1:10,560	1930 - 1931	5
Dorset	1:10,560	1938	6
Historical Aerial Photography	1:10,560	1945 - 1950	7
Ordnance Survey Plan	1:10,000	1962	8
Ordnance Survey Plan	1:10,000	1968	9
Ordnance Survey Plan	1:10,000	1985 - 1988	10
Ordnance Survey Plan	1:10,000	1993	11
10K Raster Mapping	1:10,000	2000	12
10K Raster Mapping	1:10,000	2008	13

Historical Map - Slice A



Order Details

Order Number: 27379922_1_1
Customer Ref: 09157
National Grid Reference: 382320, 125930
Slice: A
Site Area (Ha): 35.15
Search Buffer (m): 50

Site Details

Land at Park Farm, Gillingham, Dorset

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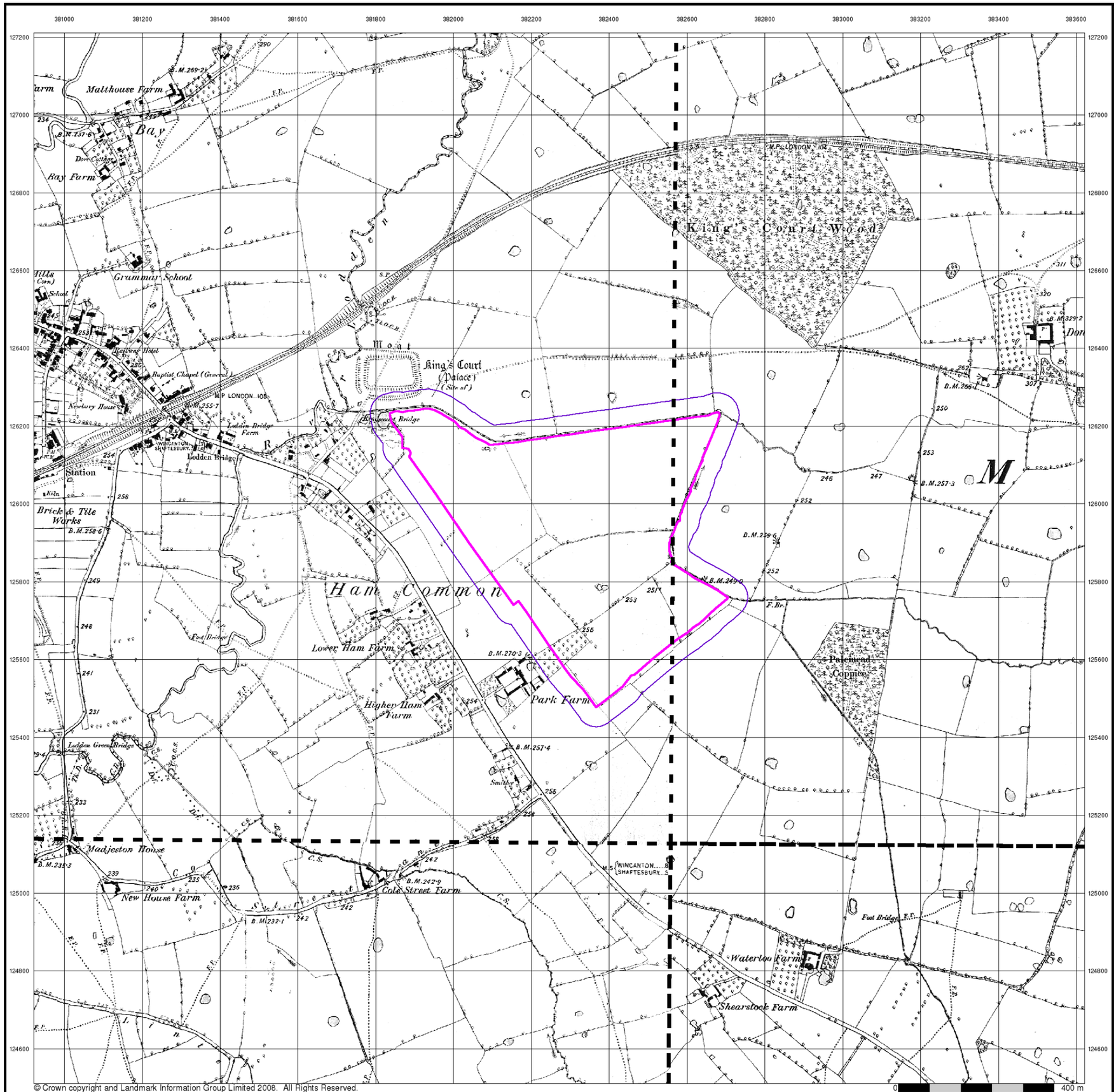


Ruddlesden geotechnical ltd

Dorset

Published 1886

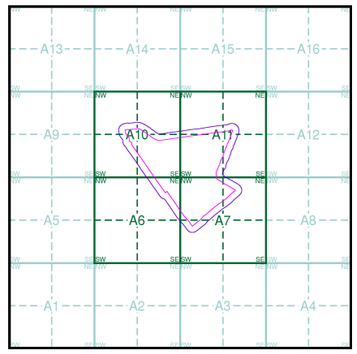
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)

003NE 1886 1:10,560	004NW 1886 1:10,560
003SE 1886 1:10,560	004SW 1886 1:10,560

Historical Map - Slice A



Order Details

Order Number:	27379922_1_1
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National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
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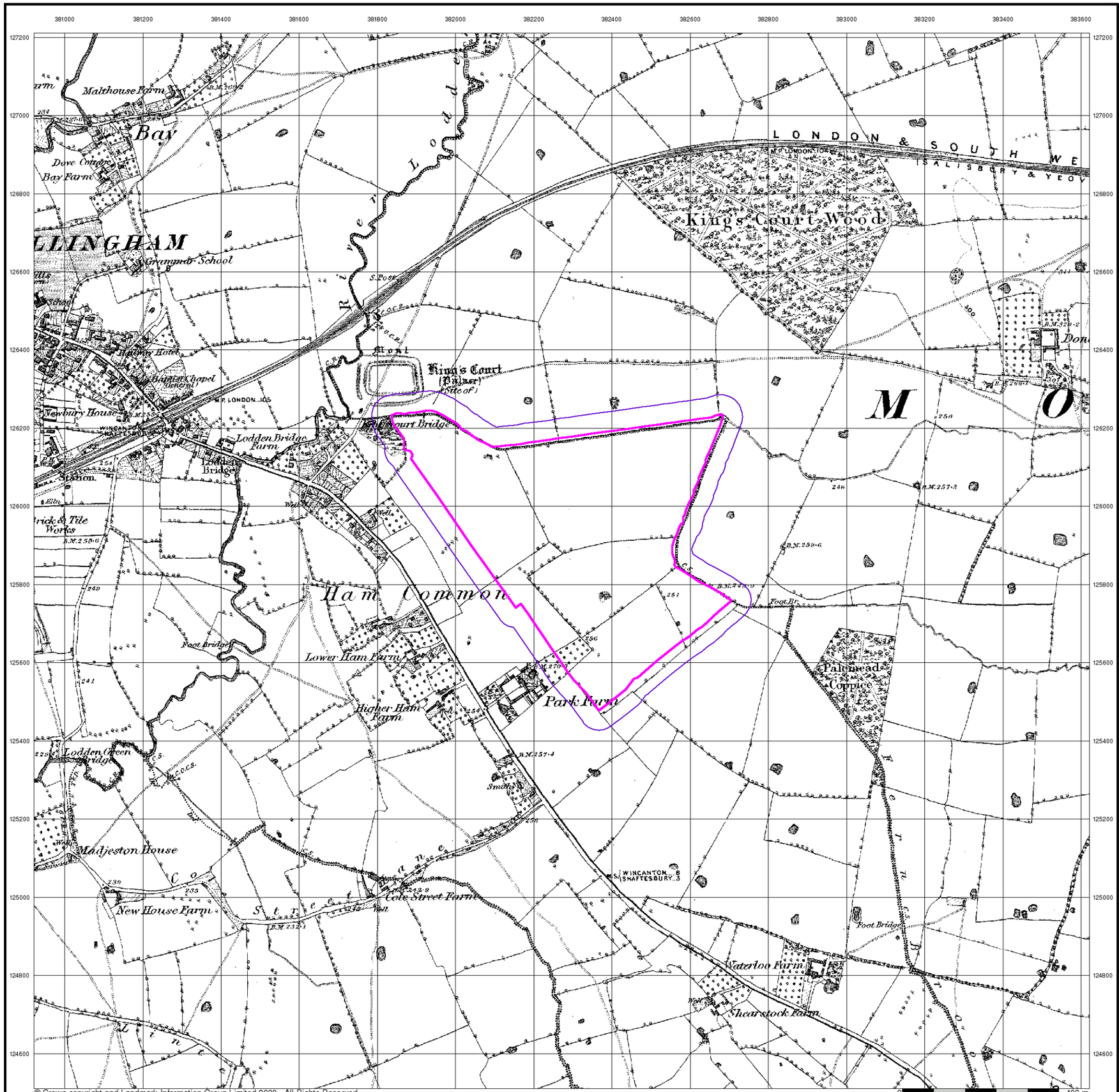


Ruddlesden geotechnical ltd

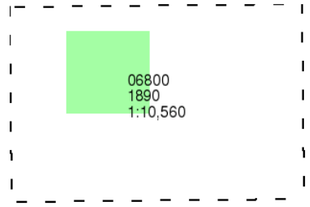
Wiltshire

Published 1890

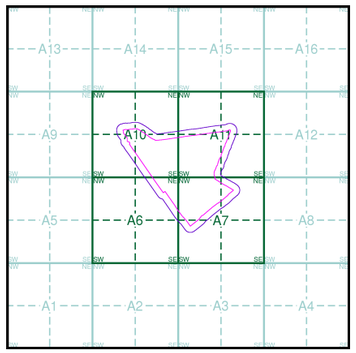
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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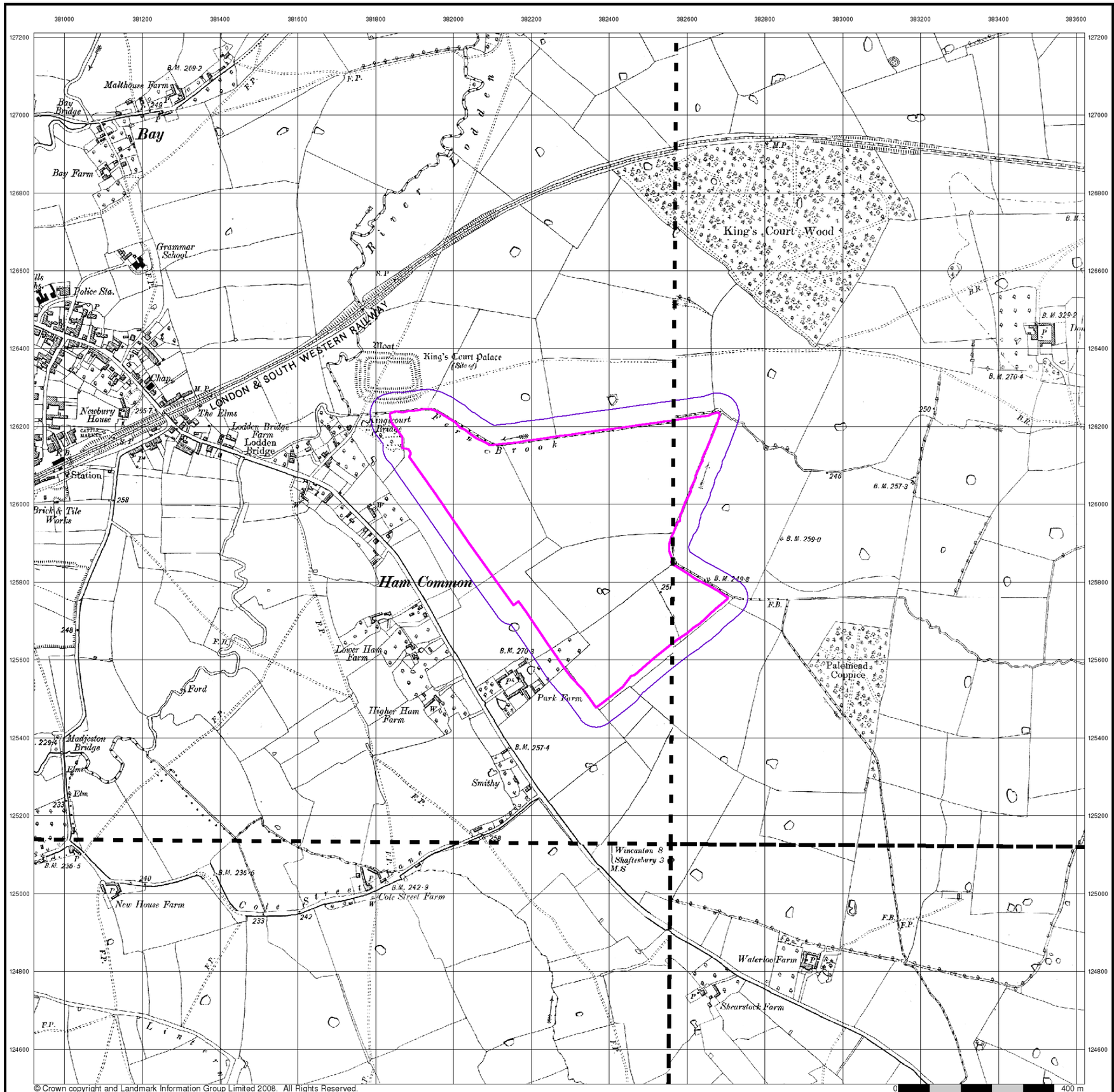


Ruddlesden geotechnical ltd

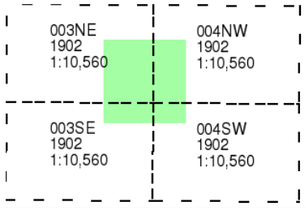
Dorset

Published 1902

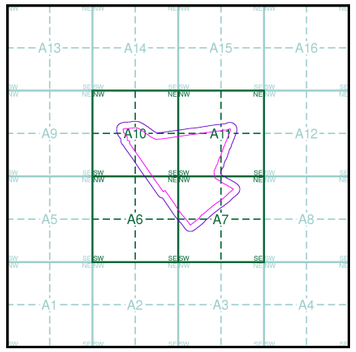
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

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Slice:	A
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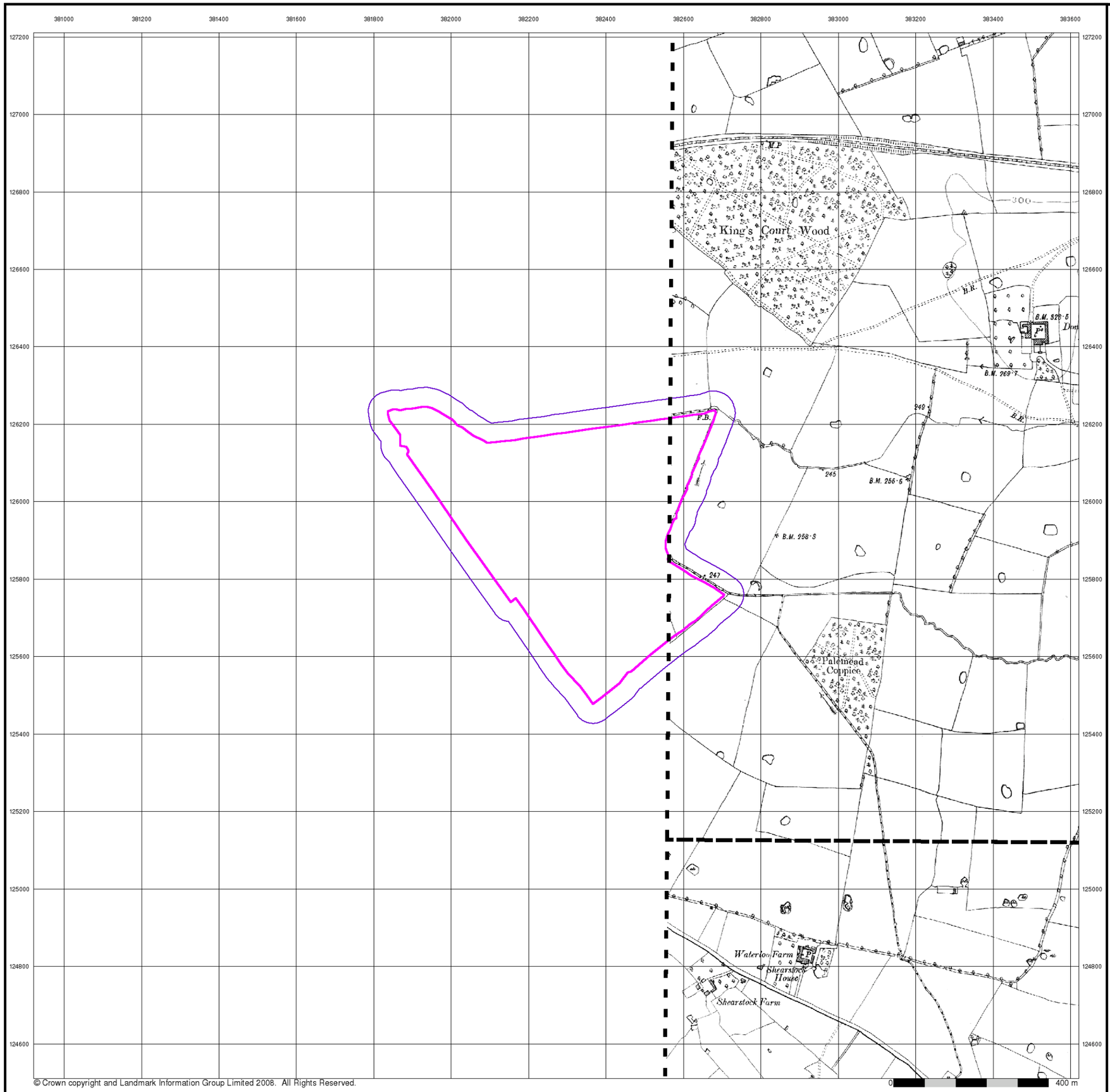


Ruddlesden geotechnical ltd

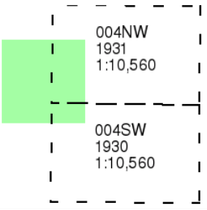
Dorset

Published 1930 - 1931

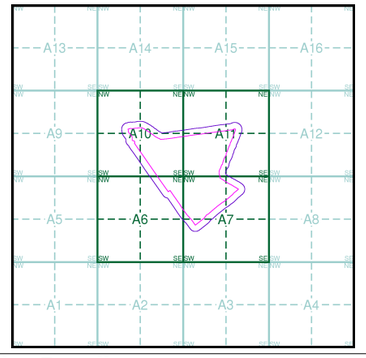
Source map scale - 1:10,560

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; these maps were used to update the 1:10,560 maps. The published date given therefore 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. In the late 1940`s, a Provisional Edition was produced, which updated the 1:10,560 mapping from a number of sources. The maps appear unfinished - with all military camps and other strategic sites removed. These maps were initially overprinted with the National Grid. In 1970, the first 1:10,000 maps were produced using the Transverse Mercator Projection. The revision process continued until recently, with new editions appearing every 10 years or so for urban areas.

Map Name(s) and Date(s)



Historical Map - Slice A



Order Details

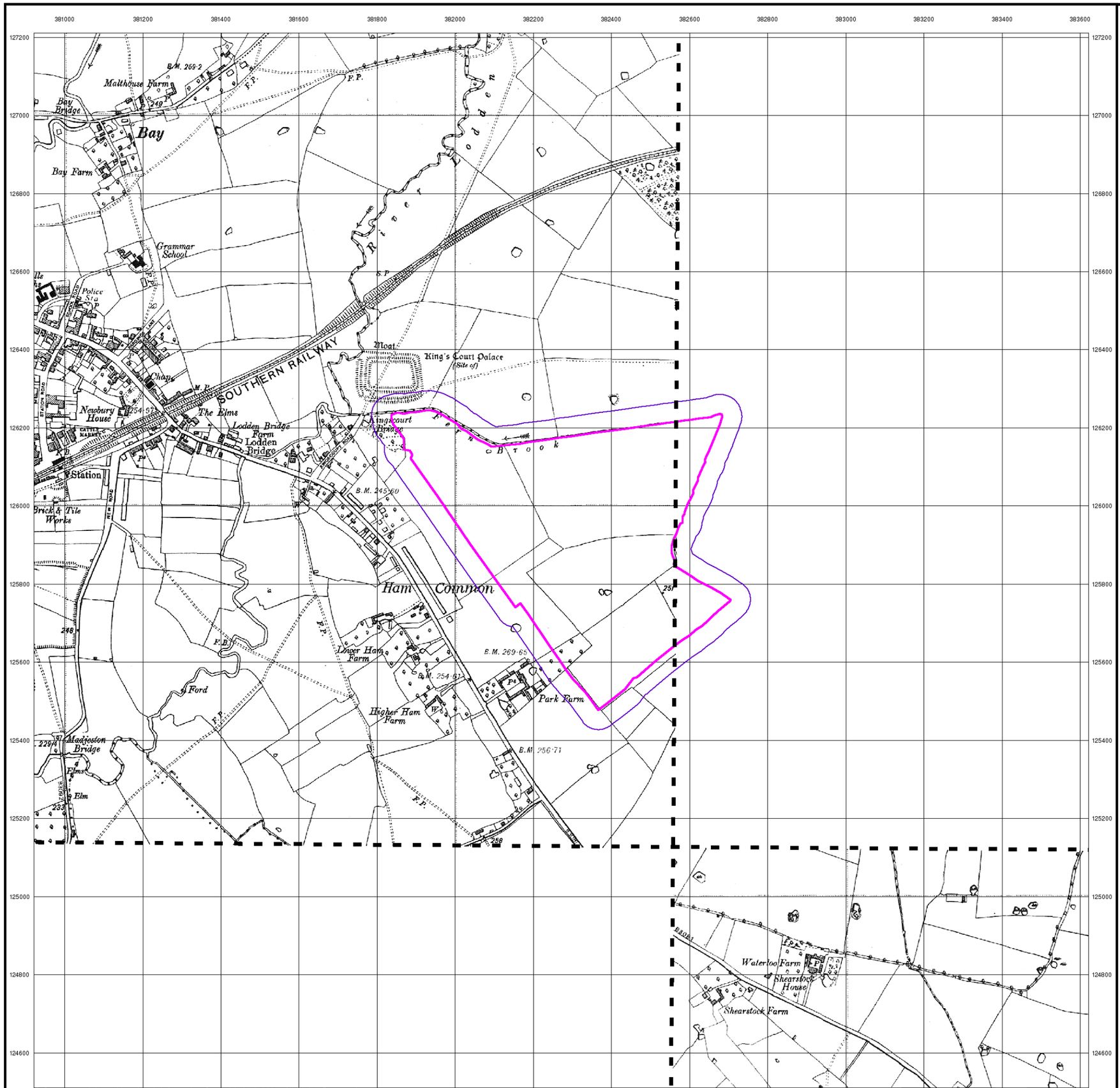
Order Number:	27379922_1_1
Customer Ref:	09157
National Grid Reference:	382320, 125930
Slice:	A
Site Area (Ha):	35.15
Search Buffer (m):	50

Site Details

Land at Park Farm, Gillingham, Dorset

LANDMARK Information Group

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



Ruddlesden geotechnical ltd

Dorset

Published 1938

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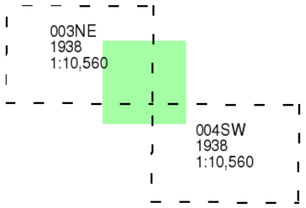
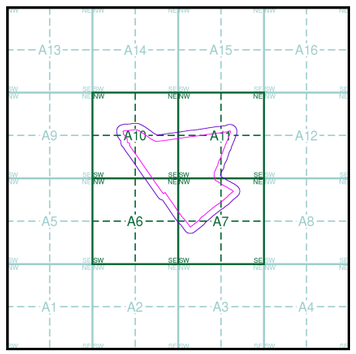


Historical Map - Slice A



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