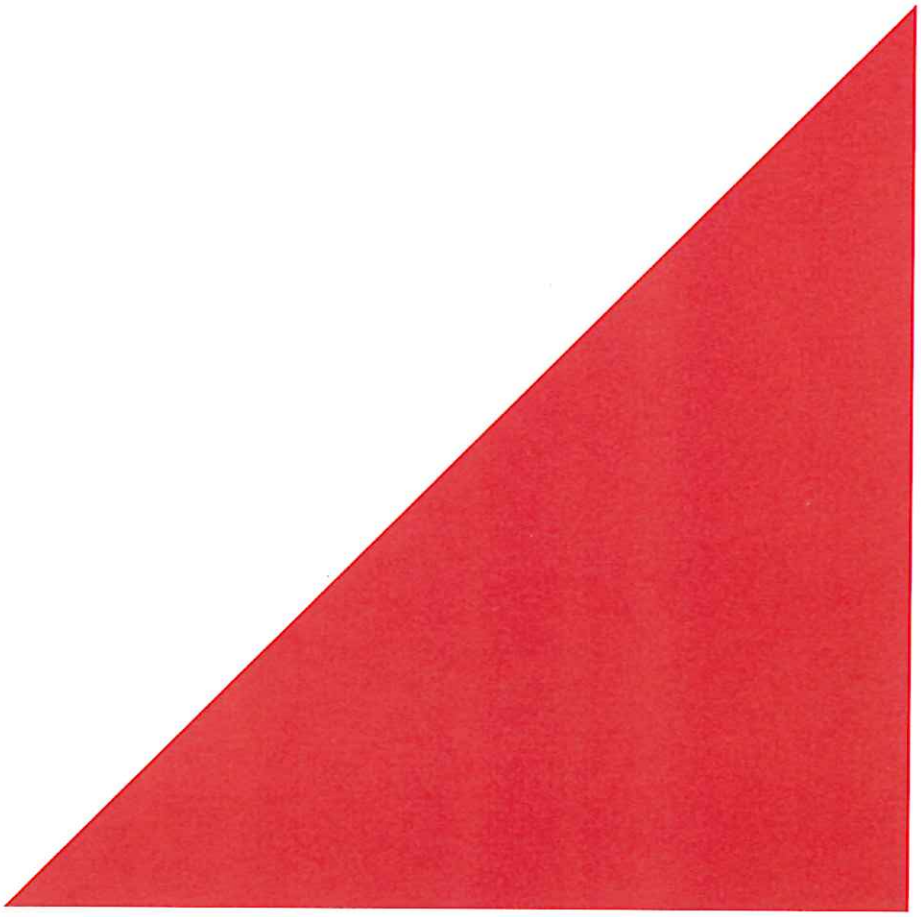
OPUS

Geo-Environmental Ground Investigation

Report for Hollyacre, Toddington Lane, Littlehampton



ARUN DISTRICT COUNCIL LU/116/13/

Geo-Environmental Ground Investigation Report for

Hollyacre,

Toddington Lane,

Littlehampton

Prepared By

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Date: March 2013
Reference: E-E1524.00
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Appendix D Geotechnical Test Results
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Factual Information

1 Introduction

1.1 Instructions

Instructions were received from Mr Charles Wiggins of Wilmington Homes Ltd to undertake a geo-environmental ground investigation to a site known as Hollyacre, Toddington Lane, Littlehampton BN17 7PP.

It is understood that the site redevelopment is to include the construction of sixty one two storey residential dwellings, ranging from terraced to detached properties with associated soft landscaping, gardens, vehicle parking and estate roads. The site is to be developed in two phases. Phase 1 area comprises the western section of the site which is currently an unoccupied field, with remnants of polythene tunnels. Phase 2 comprises the eastern quarter of the site which is currently developed commercially, and is at present to be retained.

It is recommended that the reader of this report is familiar with the phase 1 risk assessment Desk Study report, issued by Opus in February 2013.

1.2 Report Objectives

The objective of the investigation was to carry out a Phase II Geo-environmental Survey of the site. The aims of the site investigation were to obtain information relating to the ground conditions in order to obtain an initial assessment of potential contamination on the site, along with providing a preliminary appraisal of requirements for foundations, soakaways/drainage and pavement design associated with the proposed development.

1.3 Limitations

The client's attention is drawn to Appendix F to this report for the Conditions and Limitations.

This report has been prepared by Opus International Consultants (UK) Ltd (Opus) with all reasonable skill, care and diligence, within the terms of the Contract with The Client (Wilmington Homes Ltd) and taking account of the information made available by The Client, as well as the manpower and resources devoted to it by agreement with The Client. Opus disclaims any responsibility to The Client and others with respect to any matters outside the scope of the above Contract.

This report has been produced on behalf of The Client, (Wilmington Homes Ltd) and no responsibility is accepted to any other Third Party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of (Opus). If any unauthorised Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

Whilst this report may express an opinion on the possible configuration of strata, contaminants or groundwater between or beyond exploratory hole positions, or on the possible presence of features

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based on visual, verbal or published evidence, this is for guidance only and no liability can be accepted for any inaccuracy.

This report has been prepared on the understanding that the development is to comprise two storey residential dwellings with private gardens. Should the proposed site usage change significantly from the above, the contents of this report will require review and amendment as appropriate.

The comments on groundwater conditions are based on observations made at the time of the investigation. It should be noted however, that groundwater levels may vary from those reported due to seasonal or other effects.

The site plans enclosed in this report should not be used for scaling purposes.

It should be noted that the classification of soil for waste disposal purposes and any resulting waste acceptance criteria (WAC testing) required under the Landfill Regulations introduced in July 2005, is beyond the scope of this report.

2 The Site

2.1 Location & Access

The site is located immediately south of Toddington, approximately 2km north of Littlehampton town centre (is centred on National Grid Reference (NGR) 503280, 103870). The site covers an area approximately 1.7 hectares. Drawing No. E-E1524_100_P1 is located in the Drawings section of this report.

The surrounding land is predominantly occupied by commercial properties and limited residential properties.

At the time of the investigation, vehicular access to the commercial area of the site was via an access drive located directly off Toddington Lane.

2.2 Site Description

The phase 1 area is currently an unoccupied field with a central gravel surfaced track and the remnants of polythene tunnels located to either side. An area located in the southeast corner of site appeared to have been used for the incineration of packaging materials. Toddington Lane to the north of the site was situated at a lower level than the site and it is considered that the north section of the site may have been built up.

The phase 2 area was accessed by a brick paved driveway that leads from Toddington Lane to a central parking area with buildings located to the north and south. The first building encountered to the east of the driveway was a building being used as an office/storage facility by Tunmore Builders. A compound area was located to the rear of the facility which was being used for the storage of waste building materials. Located between the builder's offices and the eastern site boundary was a further compound area. The compound was noted to be unoccupied, but had been previously used by a scaffolding company.

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A large above ground LPG storage tank was located in the north of the compound area. Access further north along the eastern site boundary was limited, but an abandoned ambulance, trailers and other equipment were noted to have been discarded there.

A vehicle workshop run by Arun Alternatives Group was located in the south east corner of the site. The interior of the workshop appeared to be fairly organised with a hydraulic vehicle lift installed at the south end of the building. Plastic containers containing waste oil had been stored adjacent to the rear access door of the workshop. Further plastic containers, tyres, vehicle ramps and gas cylinders had been stored to the rear of the workshop and the southern site boundary. Visual evidence of hydrocarbon staining was observed on the surface of the site located towards the rear of the workshop and in front of the abandoned ambulance.

To the west of the workshop was a large agricultural building, the rear section of which was being used for the storage of fishing supplies and an old car. The front section was being partly used for offices and warehousing. Structural timber was also being prepared (shaped) prior to being treated in the front section of the building.

Further west towards the southern site boundary was a small timber building that was being used as an office for the fishing equipment supply company. Another large agricultural building that was being used for the storage of fabrics was located to the north.

Across the car park located adjacent to the western site boundary of the phase 1/2 area, was a small prefabricated building that was housing water pump equipment. The water pump is understood to have been previously used for irrigation of the polythene tunnels located to the west. A large circular water storage tank located to the north, fed the pump room. Situated in front of the pump room was a small toilet block, the waste from which is understood to have entered what appeared to be a septic tank to the north. Located to the north of the toilet block was a bunded above ground fuel tank that is thought to have been used for the storage of diesel.

3 Desk Study

3.1 Introduction

A desk study report has been undertaken by Opus for the site (Reference E-E1524/CDS) dated February 2013. A summary of the principal findings from the desk study is presented below.

3.2 Site History

A review of historical OS maps identified the following past land uses on site and within the surrounding area.

Date	Comments
1876 source map Scale 1:2,500	The site is set within a rural location. Deciduous trees demarcate the east and south boundaries of the site. A small detached residential property is shown adjacent to the north west corner of the site, with a small section of

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Date	Comments
	the garden partly occupying the site. A railway line and what appears to be a shallow cutting is located adjacent to the south boundary of the site. An unnamed road is shown to the north of the site. A brickyard is shown to be 265m south west of the site.
1879 source map Scale 1:10,000	A rectangular building appears to have been constructed in the north west corner of the site.
1897 source map Scale 1:2,500	The brickyard to the south west, noted on the 1876 edition is partly covered by an orchard with a windmill and glass house situated just to the north. A brick yard is located approximately 285m to the west of the site.
1911 source map Scale 1:2,500	Partial development of the land appears to have been undertaken with the construction of additional buildings on the plot of land to the east of the site.
1932 source map Scale 1:2,500	An additional building has been constructed on an adjacent plot located approximately 10m east of the site.
1961 - 1962 source map Scale 1:10,000	Extensive residential development has taken place on land located beyond 250m to the west and south west of the site.
1969 source map Scale 1:1,250	The development of Hollyacre Farm is shown on site. The residential house and garden, previously located towards the north west corner of the site, has been demolished. The plot of land to the east of the site has been redeveloped with what appears to be several farmyard buildings and three farm cottages belonging to Toddington Lane. Three garden nurseries have been constructed to the north of Toddington. Residential land has been developed to the south of the railway line.
1974 source map Scale 1:1250	'Dutch Cottages' have been constructed directly off the north east corner of the site.

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Date	Comments
1980 source map Scale 1:1,250	One of the buildings on site has been removed. Two buildings that were previously located adjacent to the eastern site boundary have been demolished.
2006 source map Scale 1:10,000	The site is as the current layout, with exception of the removal of one building that was previously located adjacent to the eastern site boundary.
1994 source map Scale 1:1,250	The east of the site has been redeveloped and is similar to its current layout. The two buildings to the south of the site have either been extended or demolished and rebuilt to form a larger footprint. The current vehicle workshop to the south east corner has been constructed with a smaller building shown adjacent to the eastern site boundary, which is located off-site. A small building previously located in the current courtyard, has been demolished. To the west side of the driveway, a small building which is currently a toilet block has been constructed. A water tank is shown further east of the toilet block. South of the tank is a smaller building which currently houses a water pump. To the west of the site, Fairhaven Nursery has been constructed with a detached residential property located adjacent to the site. The plot of land located adjacent to the site has had further buildings demolished, with only one remaining on site apart from the farm cottages.

In summary, historical mapping suggests that in the late 19th Century the site was occupied by fields and partly bounded by deciduous trees. Development of the site had progressed by the late 1870's, with the construction of a small residential property located in the north west section.

The site remained relatively unchanged until the late 1960's when Hollyacre Farm was built. Changes to the site since initial development of the farm have included the construction and demolition of various buildings. Current buildings and features on site include a vehicle workshop, water tank and toilet block.

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Historical activities that have occupied the immediate surrounding land have included a railway line and farm land. Historical activities that have been identified within approximately 250m of the site boundary, include a brickyard, orchard land, farmland and garden nurseries.

3.3 Geology

Reference to the British Geological map Solid and Drift Geology Sheet 317/332 for the region shows the site to be directly overlying drift geology in the form of River Terrace Deposits (undifferentiated). The underlying solid geology is indicated to be the New Pit Chalk Formation.

River Terrace Deposits are mainly gravels made up of flints, with a considerable sand content. Thicknesses are mainly between 1 and 7m. Eleven gravel terraces have been recognised. The five highest terraces have appreciable clay content. Clayey and sandy silts and silty clays overlie the 1st, 3rd, 5th and 6th terraces widely and overlie some of the other terrace gravels at more scattered localities.

The New Chalk Pit Formation principally comprises white, firm to moderately hard chalk, with numerous marls or paired marl seams. Flint occurs sporadically in the upper part in the deeper basin areas. The Chalk is of marine origin and is made up predominantly of tiny fossils called 'Coccoliths'. When weathered, the chalk breaks down to clay like soil. "Sinkholes" may occur near the surface.

3.4 Hydrogeology

Reference to the Environment Agency web based groundwater maps indicates that the site is overlying a Principal aquifer associated with the New Pit Chalk Formation, and a Secondary A aquifer associated with the River Terrace Deposits.

Principal aquifers consist of layers of rock that have high fracture permeability, which can usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale and in some cases form an important source of base flow to rivers.

The overlying soils have been classified as being of High Leaching Potential (U). This description is given for soils located in urban areas where there are fewer observations than elsewhere. A worst case vulnerability classification is assumed until proven otherwise.

The site is not located within an Environment Agency designated groundwater Source Protection Zone.

The nearest reported water abstraction consent is located approximately 230m to the north west of the site and permits the abstraction of groundwater for direct spray irrigation at Toddington Nurseries.

One active licenced discharge consent that pertains to the site has been reported. The licence is for the discharge of final/treated effluent into land, which is indicated to take place in the far south east section of the site. One active licence, which is for the discharge of process water into land, has been reported as being in operation within the surrounding land, located approximately 110m west of the site.

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3.5 Hydrology

With reference to the environmental database report, the nearest recorded surface water feature is a pond located approximately 140m east of the site.

The indicative floodplain map for the area, published by the Environment Agency, indicates that the site does not lie within a floodplain and is not at risk from extreme flooding by rivers or the sea. However it should be noted that this report does not constitute a detailed flood risk assessment.

3.6 Mineral Extraction

The environmental database report indicates that the site does not lie within an area of mining instability.

3.7 Environmental Considerations

Specific details relating to the environmental setting of the site are presented within the environmental database report included in the Desk Study Report. The salient issues which relate to the site are summarised as follows:

- The nearest active reported Local Authority Pollution Prevention and Control (LAPPC) is located approximately 680m south east of the site and pertains to a Petrol Filling Station.
- The nearest reported pollution incident to the site occurred approximately 720m to the east of the site. The incident involved up to 1000 gallons of heating oil that leaked from a tank. The Environment Agency recorded the severity of the incident as a Category 2 major incident.
- No historic or current landfill site has been reported within 470m of the site.
- A closed licensed waste management facility, which took non-biodegradable wastes (not construction) when in operation, is located approximately 45m south east of the site.
- The closest registered waste transfer site is located approximately 380m north west of the site.
- Reported active contemporary trade directory entries on site are Arun Autogas Ltd, Outback Trailers and Sussex Scaffolding.
- Reference to the Building Research Establishment (BRE) publication BR211 "Radon: guidance on protective measures for new dwellings" (2007 edition) indicates that the site is not located within an area where radon protective measures are required in the construction of new dwellings.
- There is no reported site of special scientific interest or national nature reserve located within close proximity to the subject site.

3.8 Potential Contaminants

Phase 1 Area

Phase 1 comprised a disused field that was predominantly gravel surfaced, with the remnants of polythene tunnels historically associated with a nursery. At the time of the site walkover survey the field was noted to have become overgrown with scrub vegetation and that the north section of the site may have been built up with made ground. An area in the southeast corner of site has been used for the incineration of packaging materials etc.

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The historic map review and planning application search indicates that this section of the site has not historically been the subject of any significant development. Historical mapping revealed that the far north west corner of Phase 1 was occupied in the late 19th Century and early 20th Century, by a garden and outbuildings belonging to a neighbouring (off-site) property.

The following potential contaminants that may have been generated through past site activities have been listed for consideration:

- Insecticides and herbicides associated with nursery;
- Metals, metalloids, Asbestos Containing Materials (ACMs) and Polycyclic Aromatic Hydrocarbons (PAHs) associated with the burning of materials (limited to the southeast corner of Phase 1).
- Metals, metalloids, Asbestos Containing Materials (ACMs) and Polycyclic Aromatic Hydrocarbons (PAHs) associated with made ground

Phase 2 Area

Phase 2 was occupied by a number of buildings for light commercial purposes the time of the site walkover survey. Collectively these formed Hollyacre Farm.

Reference to planning documents revealed that Hollyacre Farm was first developed with the construction of agricultural buildings in the mid 1960's. A toilet block was added to the site in 1986 and planning permission was sought in the same year for one of the farm's buildings to be used for the restoration of classic, sporting and racing motor vehicles. Venture Windows and Doors Ltd gained temporary planning consent to use an agricultural building on site for the storage of materials and plant, associated with their work practices in 1992.

A review of available historic maps indicates that Hollyacre Farm was initially constructed in the 1960's and comprised five detached buildings. No significant changes occurred to the site's layout until the early 1990's, when additional buildings were constructed and extensions/conversions to the existing property appear to have taken place.

During the site walkover survey, active commercial trades observed on site included a building firm, a vehicle workshop run by Arun Alternatives Group, fishing equipment suppliers and textile suppliers. Also, a scaffold company historically operated from the site.

Waste materials noted within the compound areas associated with the trades on site included building waste. In addition, an ambulance, trailers, waste oil contained in plastic drums, tyres, vehicle ramps, gas cylinders and other equipment had been left adjacent to the vehicle workshop.

Hydrocarbon staining was observed on the surface of the site, located in close proximity to the abandoned ambulance, and adjacent to the rear of the vehicle workshop.

The following potential contaminants that may have been generated through past site activities have been listed for consideration:

- Hydrocarbons and PAHs associated with the above ground fuel storage tank;

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- Hydrocarbons, PAHs and Volatile Organic Compounds (VOCs) associated with the storage of waste, chemicals and solvents (localised to the commercial units);
- ACMs associated with historic site developments, demolition of buildings, storage of trade materials;
- Metals, metalloids, ACMs and PAHs associated with the presence of made ground that may exist beneath the site.

4 Preliminary Conceptual Site Model

4.1 Relevant Pollutant Linkages

The term Possible pollutant linkage, is defined as one that has the potential to represent unacceptable risks to human health or the environment, but has not been identified through risk assessment. Where a possible pollutant linkage has been identified, further investigation and risk assessment may be required to establish whether a relevant pollutant linkage exists.

The desk study report identified the following possible pollutant linkages based on historic activities, bearing in the mind the development proposals for the site:

Table 4.1: Preliminary Conceptual Site Model for Pollutant Linkages for Hollyacre, Toddington Lane, Littlehampton – Phase 1 Area.

Source	Pathway	Receptor	Risk Assess-ment	Comments
Herbicides and insecticides Area of site used for bonfires Area built up Made Ground	Direct Ingestion of contaminated soil	Future site residents	Medium	Greatest risk to future residents is via direct contact with contamination within soils in the proposed private garden areas and soft landscaping.
	Direct contact with contaminated soil Inhalation of dust from contaminated soil	Construction workers Maintenance workers	Low	Construction workers are considered to be at a greater risk during the ground works phase of redevelopment. However the appropriate use of PPE can be used to reduce the risk.
	Migration percolation into surface or groundwater	Groundwater migrating beneath site	Low	The site is immediately overlying a secondary A aquifer; however it is not located within an Environment Agency groundwater source protection zone.

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Source	Pathway	Receptor	Risk Assess-ment	Comments
				It is considered that the consistency of the overlying River Terrace Deposits may help to attenuate the migration of contaminants into the underlying New Pit Chalk, which is a principal aquifer, if the deposits have a high clay content.
	Direct Contact	Building Materials	Low	Some substances can be deleterious to building materials e.g. certain organic contaminants can permeate some types of plastic pipes tainting the site's water supply.
Asbestos	Inhalation of fibres	Future site residents	Low to Medium	Potential for ACMs to be located within the area of the site used for bonfires and within the far north west corner of the site associated with the garden and outbuildings that were historically located there.
		Construction workers		
		Maintenance workers		

Table 4.2: Preliminary Conceptual Site Model for Pollutant Linkages for Hollyacre, Toddington Lane, Littlehampton- Phase 2 Area.

Source	Pathway	Receptor	Risk Assess-ment	Comments
Made Ground Above ground oil storage tank Storage of trade waste and other equipment	Direct Ingestion of contaminated soil	Future site residents	Medium	Greatest risk to future residents is via direct contact with contamination within soils in the proposed private garden areas and soft landscaping.
	Direct contact with contaminated soil	Construction workers	Low	Construction workers are considered to be at a greater risk during the ground works phase of redevelopment. However the appropriate use of PPE can be used to reduce the risk.
	Inhalation of dust from contaminated soil	Maintenance workers		

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Source	Pathway	Receptor	Risk Assess-ment	Comments
	Migration percolation into surface or groundwater	Groundwater migrating beneath site	Low to Medium	The site is immediately overlying a secondary A aquifer; however it is not located within an Environment Agency groundwater source protection zone. It is considered that the consistency of the overlying River Terrace Deposits may help to attenuate the migration of contaminants into the underlying New Pit Chalk, which is a principal aquifer, if the deposits have a high clay content.
	Direct Contact	Building Materials	Low	Some substances can be deleterious to building materials e.g. certain organic contaminants can permeate some types of plastic pipes, tainting the site's water supply.
Asbestos	Inhalation of fibres	Future site residents Construction workers Maintenance workers	Medium	Asbestos Containing Materials (ACM's) are highly likely to be present within the buildings on site. It is recommended that an asbestos survey is undertaken so that all ACM's can be appropriately removed from site prior to the existing buildings being demolished. Furthermore ACMs could be present within any underlying made ground generated through historic demolition works on site and/or from made ground historically imported on to site for redevelopment works. Historically trade waste left on the site's surface may have contained ACMs

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5 Investigation Methodology

5.1 Objectives

Given the findings of the desk study searches and with reference to the preliminary conceptual model for the site (as detailed in Section 4), the objectives of the intrusive investigation are as follows:

- To characterise the ground conditions across the proposed development area.
- To confirm potential pollutant linkages identified within the Preliminary Conceptual Site Model.
- To undertake a qualitative assessment of risks posed by any identified contaminants to the recognised receptors.
- To provide a preliminary geotechnical assessment of the proposed development area in the context of the proposed development.

The techniques adopted for the investigation have been chosen considering the anticipated ground conditions and development proposals on site and bearing in mind the nature of the site, limitations to access in some areas, underground services, current tenants and other logistical limitations.

The site work was carried out on the 14th and 15th January 2013 and comprised window sampling and trial pitting under the supervision of Chris Summers and Steven Dempsey of Opus. Exploratory Hole Location plans ref. drawing number EE1524.00 101/P1 and 102/P1 are presented in the Drawings section of this report.

Table 5.1 summarises the rationale behind the exploratory hole locations and any changes to the original scope.

Table 5.1: Exploratory Hole Location and Rationale

Operation	locations	Rationale
Window Sampling	WS1 – WS14	Assess potential contamination within shallow soils Assess geotechnical conditions of soil to 4.45m begl and establish density of the underlying strata by undertaking standard penetration tests (SPT's) Collect samples for laboratory environmental and geotechnical testing.
Trial Pit by Hand	HP1 - HP2	Assess potential contamination within shallow soils to a depth of 1.20m begl located within the vicinity of staining of surface soils.
Trial Pits	TP1 – TP12	Assess potential contamination within shallow soils Assess the geotechnical conditions of the soil to 3.40 m begl Collect samples for laboratory environmental & geotechnical

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Operation	locations	Rationale
		testing. Assess the infiltration rate of the underlying natural strata across the site by undertaking Soakaway tests in TP1 – TP7.

5.2 Clearance of Underground Services

Prior to commencing ground investigations, a walkover survey was carried out to identify the presence of underground services. Where underground services were suspected, exploratory positions were relocated in the interests of health and safety.

In addition to the above, the positions were scanned with a cable avoidance tool (CAT) as a further precautionary measure.

5.3 Site Works

All exploratory holes were logged by a qualified Opus Geo-Environmental Engineer, generally in accordance with BS EN 14688 'Geotechnical Investigation and Testing – Identification and Classification of Soil'. Disturbed samples were taken at selected intervals from the strata encountered, placed in appropriate containers and submitted for geotechnical and chemical testing.

Fourteen window sample holes (WS1 to WS14) were advanced using a tracked percussive Window Sampling rig, to depths of between 4.0m and 4.45m below existing ground level (begl).

On completion, the window sample holes were backfilled with arisings and hardstanding (block paviours) were reinstated where necessary.

In situ standard penetration testing (SPT) was carried out in selected window sample holes to derive 'N' values, which can be used to assess the relative strength and density of encountered strata.

It should be noted that SPT 'N' values quoted within the window sample hole logs, presented in Appendix 'B' and referred to within this report, are presented as corrected values in accordance with BS EN 22476 Part 3, to account for the rig efficiency, borehole depth, overburden factors etc. Further correction of the 'N' values should therefore not be necessary. Raw field data is archived within the Opus project file and can be provided on request.

Twelve trial pits (TP1 to TP12) were excavated using a mechanically JCB 3CX type excavator to depths of between 2.30m and 3.40m begl.

Two trial pits (HP1 and HP2) were excavated using hand tools to a depth of 1.20m begl, these were undertaken in locations where access for mechanical plant was restricted.

Selected soil samples were taken from each of the exploratory holes and placed in containers appropriate for the type of laboratory analysis to be undertaken. All samples were labelled

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following standard protocols to ensure the site location, borehole location, sample depth, sample type, date and job reference were all clearly identifiable.

Once soil samples were collected they were stored in cool boxes containing chilled ice packs to preserve sample integrity as far as reasonably practicable. Subsequently the samples were transported to the laboratory under QA / QC controlled conditions employing a chain of custody system to ensure sample integrity prior to the laboratory testing.

5.4 Chemical Laboratory Testing

The programme of chemical tests was undertaken on samples obtained from the intrusive investigation to assess the levels of contamination within the strata encountered on the site with regard to identified receptors, as detailed within the Conceptual Site Model. This analysis was carried out at the MCERTS accredited laboratory of SAL, for suites of determinands chosen bearing in mind the Conceptual Model for the site presented in Section 4.

A sample of near surface soil consisting of Made Ground if present, or natural soils were selected in order to identify potential contaminants that may pose a risk to human health.

In summary, the following analyses were carried out:

- General Screening suite (including metals, pH, Sulphate, Phenols).
  (28 samples)
  Targeted at samples of near surface soil, including made ground (17) and natural soils (11).

- PAHs
  (31 samples)
  Targeted at samples of near surface soil, including made ground (17) and natural soils (14).

- TPH and BTEX
  (8 samples)
  Targeted at samples of near surface soil, including made ground (1) and natural soils (7).

- VOCs
  (4 samples)
  Targeted at samples of near surface soil, including natural soils (4).

- Asbestos
  (11 samples)
  Targeted at samples of near surface soil, including made ground (14) and natural soils (6).

- Herbicide and Insecticide Suites
  (12 samples)
  Targeted at samples of near surface soil including made ground (5) and natural soils (7).

- Total Organic Content
  (11 samples)
  Targeted at samples across the site to characterise mean organic content of the soils including made ground (7) and natural soils (4).

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With regards to potential contamination, analysis was scheduled on separate soil types to allow a statistical analysis of results, with emphasis placed on analysis of near surface soil samples given the findings of the conceptual model and nature of the proposed redevelopment. The soil samples predominantly consisted of arisings taken from either the made ground or natural ground on site, and have been assessed separately to allow a statistical analysis of results for the different material. Analysis was therefore targeted towards soil types.

Results of the chemical testing are presented in Appendix 'C' along with a statistical assessment of the results in line with current guidelines.

5.5 Geotechnical Laboratory Testing

Representative samples were submitted to an approved and accredited laboratory and the following tests scheduled to determine soil properties as related to foundation design and construction.

- Aggressive ground suite – pH and water soluble sulphates
  (9 samples)
  To provide general characterisation across the site, through depth and between different soil types.

- Plasticity Index Determinations – Cohesive samples
  (15 sample)

- Moisture Content Determinations – Cohesive samples
  (15 samples)

- California Bearing Ratio Tests – Near surface samples in close proximity to proposed roads
  (5 samples)

- Particle Size Distribution (Wet Sieve and Sedimentation) –Non- Cohesive samples
  (4 samples)

Results of the geotechnical testing are presented within Appendix 'D'.

5.6 In-situ Geotechnical Testing

5.6.1 Clegg Impact Tests

Clegg Impact tests were carried out in nine of the trial pits excavated across the site. The impact values determined by the instrument have been converted into equivalent CBR% values.

5.6.2 Soil Permeability Tests

Soakaway tests were undertaken in trial pits TP1 to TP7. The dimensions of the excavation were accurately measured prior to the trial pit being rapidly filled with clean water. The water was pumped from a road tanker. Once the hole was filled with water, the water depth was measured periodically relative to a datum. The tests generally were undertaken over the two days we were on site.

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The Clegg impact tester and Soakaway test results are shown in Appendix E

6 Results of the investigation

6.1 Strata Encountered

Ground conditions encountered during the site investigation were broadly similar to those identified in the published literature and in Section 3 of this report.

In summary the ground conditions comprised made ground material overlying the sandy clay or clayey sand of the River Terrace Deposits and structureless chalk of the New Pit Chalk Formation. A copy of the soil logs are presented in Appendix B. Trial hole photographs are presented in Appendix A.

The variations in these strata and their thicknesses for each exploratory hole are summarised in Table 6.1.

Table 6.1: Summary of encountered ground conditions

Location	Made Ground (sandy gravel)		Made Ground		River Terrace Deposits		New Pit Chalk Formation	
	From (mbegl)	Thickness (m)	From (mbegl)	Thickness (m)	From (mbegl)	From (mbegl)	From (mbegl)	From (mbegl)
TP1	Not encountered		GL	0.40	0.40	>2.71	Not encountered	
TP2	Not encountered		GL	0.10	0.10	>3.10	Not encountered	
TP3	GL	0.04	0.04	0.06	0.10	>3.24	Not encountered	
TP4	Not encountered		GL	0.50	0.50	2.80	2.80	>2.85
TP5	GL	0.05	0.05	0.05	0.10	>2.41	Not encountered	
TP6	GL	0.03	0.03	0.09	0.12	>2.78	Not encountered	
TP7	GL	0.15	0.15	0.20	0.35	>2.59	Not encountered	
TP8	Not encountered		GL	0.55	0.55	>3.40	Not encountered	
TP9	GL	0.03	0.03	0.57	0.60	>2.65	Not encountered	
TP10	GL	0.05	0.05	0.10	0.15	>3.20	Not encountered	
TP11	Not encountered		GL	1.05	1.05	>2.50	Not encountered	
TP12	Not encountered		GL	0.20	0.20	>2.30	Not encountered	
HP1	Not encountered		Not encountered		GL	>1.20	Not encountered	
HP2	Not encountered		GL	0.45	0.45	>1.20	Not encountered	

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WS1	Not encountered	GL	1.10	1.10	2.35	2.35	>4.45
WS2*	Not encountered	GL	0.50	0.50	3.80	3.80	>4.45
WS3	Topsoil GL - 0.35			0.35	3.50	0.35	>4.00
WS4	Concrete GL – 0.07	0.07	0.18	0.25	>4.45	Not encountered	
WS5	Concrete GL – 0.07	0.07	0.13	0.20	2.80	2.80	>4.45
WS6	Concrete GL – 0.07	0.07	0.13	0.20	2.95	2.95	>4.45
WS7	Topsoil GL - 0.25			0.25	>4.00	Not encountered	
WS8	Not encountered	GL	0.20	0.20	2.95	2.95	>4.00
WS9	Not encountered	GL	0.25	0.25	3.80	3.80	>4.45
WS10	Not encountered	GL	0.25	0.25	>4.45	Not encountered	
WS11	Not encountered	GL	0.20	0.20	>4.45	Not encountered	
WS12	Not encountered	GL	0.40	0.40	>4.40	Not encountered	

* No recovery between 2.00m and 3.60m begl.

6.1.1 Made Ground

The exploratory holes undertaken as part of this investigation have revealed that the study area is underlain by a layer of made ground, which was found to be up to a maximum thickness of 1.10m in WS1.

Made ground consisted of a heterogeneous deposit comprising dark brown, fine to medium sandy gravel, or a firm consistency silty sandy clay with rare whole brick and cobbles. The general made ground thickness is between 0.1m and 1.1m (average 0.2m).

A relatively thin (up to 0.075m) distinct layer of made ground comprising light grey, white and brown, subangular to subrounded, fine to medium flint gravel was encountered at the surface of trial pits TP3, TP7, TP9 and TP11.

Foreign objects visually identified within the general made ground material included quartzite, brick, limestone, sandstone, chalk, wood, wire and plastic and plastic membrane.

Visual and olfactory evidence of contamination within the made ground was observed for arisings taken from trial pit HP1 and HP2. HP1 and HP2 were excavated in areas where hydrocarbon staining was observed on the surface of the site, located towards the rear of the workshop and in front of the ambulance. A hydrocarbon odour and staining of the arisings was observed between ground level to the depth of 0.65m begl in HP1 and 1.20m begl in HP2, which were into the River Terrace Deposits beneath.

6.1.2 Superficial Deposits

River Terrace Deposits occurred beneath the Made Ground deposits in all exploratory holes, with the exception of HP1, where natural material was encountered from the surface of the pit.

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The River Terrance Deposits comprised an interbedded sequence of soft to firm, tending to stiff consistency sandy clays, with occasional horizons of medium density, slightly clayey, slightly gravelly sand. The general thickness of the river terrace deposits was proven from investigation to be from 3m to in excess of 4m.

The soft clay generally occurs to a maximum depth of 1.5m, thereafter increasing to a firm consistency. Occasionally a lower lying soft horizon of clay was noted to occur at a depth of 2.3m. The sand deposits generally lay towards the base of the deposit and varied in thickness from 0.3m to 2m.

Hand shear vane tests undertaken on the clays in the trial pits varied from 47 to 112 Kpa, indicating a Medium to High strength soil.

SPT 'N' values obtained during the investigation within the River Terrace Deposits revealed corrected 'N' values in the range 11 to 68, within the non-cohesive deposits generally encountered at a depth greater than 2.00m begl, indicating medium dense to very dense strata. Typically it was noted to be of medium density.

No visual / olfactory evidence of contamination was noted within the River Terrace Deposits, apart from those previously noted for HP1 and HP2.

6.1.3 New Pit Chalk Formation

Basal chalk was identified lying directly beneath the River Terrace Gravels within seven of the window sample holes, including WS1, WS2, WS3, WS5, WS6, WS8 and WS9, and trial pit TP4. The chalk is represented as a structureless subangular gravel, white in colouration with orange brown staining. The chalk is assessed as being of Dc grade

SPT 'N' values obtained during the investigation within the New Pit Chalk Formation ranged between 23 to 31, at a depth of 3.00m begl and between 25 to 51 at 4.00m begl.

No visual / olfactory evidence of contamination was noted within the New Pit Chalk Formation arisings.

6.2 Groundwater Observations

Groundwater was encountered within exploratory holes WS2, WS6, WS10 and TP5 during the site investigation works. Only occasional groundwater seepages were recorded between 1.2m and 2.0m begl. A permeability test was undertaken in TP5. The water level rose to a depth of 1.015m begl overnight and remained at this level during the second day of the test

It should be noted that groundwater levels may fluctuate for a number of reasons including seasonal variations.

6.3 Chemical Testing (Soils)

The results of the chemical testing on soil samples have been reviewed in accordance with the legislative framework and criteria set out in Appendix 'C'. The Contaminated Land Exposure Assessment (CLEA) methodology has derived four 'generic' land use scenarios for the assessment

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of potential contamination, namely residential (with home-grown produce), residential (without home grown produce), allotment and commercial.

The proposed end use of the site, which is residential with gardens, fits the residential with plant uptake CLEA end use scenario. It has therefore been considered appropriate by Opus to compare the laboratory analysis results to the CLEA Soil Guideline Values for residential land use with plant uptake at this stage to provide a preliminary assessment of any significant contamination given the intended end use of the site.

Where SGV's or Opus IHSV's are not published for certain compounds, reference is initially made to any results exceeding the laboratory detection limit, to highlight them for subsequent discussion and assessment.

Should the nature of the proposed development change significantly, it may be necessary to re-evaluate the contamination results and recommendations presented within this report.

The type of contaminants e.g. metals and PAH results and soil type (made ground, made ground (sand) and natural deposits) have been split into separate data sets for statistical assessment purposes. Statistical results are presented within Appendix 'C' as separate spread sheets for metals and PAH's based on soil type.

To provide a preliminary assessment of potential risks posed by the relevant contaminants, reference has been made to Opus In House Screening Values (IHSV's Version 2009.2 dated 25th August 2009).

Average Total Organic Carbon (TOC) values have been proven to be 1.6% for made ground (sand), 1.3% for general made ground and 2.8% for the River Terrace Deposits samples analysed. This is equivalent to a Soil Organic Matter (SOM) of 2.2 to 2.8% for made ground and 2.80% for natural ground samples. On this basis, for organic parameters, the 3.0% Soil Organic Matter scenario for each soil type has been utilised for assessment purposes to be conservative in the first instance.

The statistical mean and maximum value tests undertaken on the metal and PAH results for the three soil types tested indicate that the statistical 95th Percentile values (US95) for the determinands tested are all below the relevant Opus IHSV's and the results indicate an absence of significant contamination of the near surface soils within the study area.

The soils analysed for TPH contaminants predominantly comprised natural ground. Only one sample of made ground was analysed for TPH. The results of the analysis reported individual concentrations that were all below the Opus IHSV's.

All of the results for Phenols, Cyanide, Herbicide and Insecticide Suites are below the laboratory detection limit, indicating an absence of significant contamination from these substances.

Made ground samples of soil were analysed for the identification of asbestos using polarised light microscopy, Chrysotile fibres were detected in WS2/0.3m which was located under the current site access driveway in the phase 2 area of the site.

Based on the above methodology, chemical testing of the soil samples recorded the presence of the following contaminants of concern.

- Asbestos fibres detected in the phase 2 area of the site.

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Recommendations relating to the chemical results detailed above are provided within Section 8 of this report.

6.4 Geotechnical Testing

The results of geotechnical testing for pH and sulphate carried out during this investigation are included alongside the chemical testing data in Appendix 'D' all other geotechnical laboratory results are contained in Appendix "E".

The water soluble sulphate content and pH values determined for selected samples taken from across the site have proved values in the following ranges;

- Water Soluble Sulphate (SO4) <0.01 to 0.03g/l
- pH 6.2 to 8.4 pH units

In addition to the above, the results of the Plasticity Index testing and moisture content determinations have been proved in the following ranges;

- Plasticity Index 10 to 19%
- Moisture Content 16 to 27%

When adjusted to account for the percentage of particles passing a 425µm sieve, the Modified Plasticity Index (MPI) value ranges between 10 to 19%, indicating that the natural strata underlying the site are classified as being of 'Low shrinkage potential' in accordance with the requirements laid out in NHBC Chapter 4.2. The moisture contents generally are lie close to the Plasticity Index, which would indicate a reasonable potential for reuse on site.

Five bulk disturbed samples were laboratory analysed for CBR value. The results of laboratory CBR tests on the cohesive soil samples generally gave values ranging of between 1% - 2%. However the sample analysed from TP5/0.7m attained a result of 0.19%. It is considered likely that the sample had higher moisture content than the other samples analysed, as it was taken from close proximity to the groundwater table

Four non cohesive deposits from the River Terrace Deposits had particle size distribution, wet sieve and sedimentation on the finer particles, they all are uniformly graded

Geotechnical recommendations relating to the above results are included within Section 9 of this report.

6.5 In-situ Geotechnical Testing

The results of the geotechnical testing data for the Clegg impact Tester, soil permeability test results and calculated infiltration rates along with the calculated approximate CBR's and infiltration rates are contained within Appendix 'E'

6.5.1 Clegg Impact Tests

The in-situ approximate CBR values undertaken on near surface samples, produced by the Clegg Impact Soil Tester, provided values of 3% - 4% for the cohesive subgrade materials, and values of 5% - 7% for the granular soils.

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6.5.2 Soil Permeability Tests

The soil permeability rates have been calculated from the test data and the rates are shown in table 6.5 below, along with comments on the test/calculation method:

Table 6.5: Summary of soil permeability tests and calculated infiltration results

Trial Pit	Water depth at commencement of test (m begl)	Water depth at completion of test (m begl)	Infiltration Rate	Comment
TP1	1.370	2.020	2.68×10^{-7}m/s	Permeability rate based on actual depth of water level dropped during the test
TP2	1.770	1.900	1.41×10^{-7}m/s	Permeability rate based on actual depth of water level dropped during the test
TP3	1.990	2.620	2.65×10^{-5}m/s	The non-cohesive sand deposits slumped into the base of the trial pit during the test. The final base depth of the pit was 2.66m begl
TP4	1.740	2.200	8.16×10^{-7}m/s	Permeability rate based on actual depth of water level dropped during the test
TP5	1.110	1.015	Not calculated	Water level rose in trial pit overnight and remained at this level during the second day of the test
TP6	1.780	1.630	Not Calculated	Water level rose in trial pit overnight and remained at this level during the second day of the test
TP7	1.320	2.050	2.99×10^{-6}m/s	The non-cohesive sand deposits slumped into the base of the trial pit during the test and the final base depth of the pit was 2.15m begl

Geotechnical recommendations relating to the above results are included within Section 9 of this report.

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Assessment & Recommendations

7 Introduction

This report has been prepared to provide preliminary information specific to the ground conditions at the site. It is understood that the proposed development comprises the construction of sixty one two storey residential dwellings, with associated soft landscaping, gardens, vehicle parking and estate roads.

Recommendations made within this report should be considered to be preliminary and are subject to confirmation once development proposals and structural details have been finalised. In particular the recommendations for foundation designs for the proposed development will be largely dependent on the nature and magnitude of imposed loads associated with the proposed structures.

Given the nature of the proposed development, this investigation has been carried out on the assumption that the final development of the site will conform to the 'residential with home grown produce' land use scenario, in accordance with the Contaminated Land Exposure Assessment (CLEA) methodology.

Should the proposed site usage change significantly from the above, the contents of this report will require review and amendment as appropriate.

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8 Environmental Assessment

8.1 Soil Contamination Summary

The findings of this investigation have been assessed in relation to a combination of specific site characteristics as identified within the Preliminary Conceptual Model and with reference to the proposed future site end-use.

The drift hydrogeology underlying the site has been classified as a Secondary A Aquifer and the solid geology as a Principal Aquifer. Only occasional groundwater seepages were noted, lying at depths of between 1.3m and 2.0m begl. However, it is unknown whether the water strikes represent perched water seepage, or the main groundwater system.

Potential sources of contamination have been targeted by the intrusive ground investigation and chemical analysis of the retrieved soil samples has been specifically tailored to the identification of potential 'contaminants of concern', based on desk study searches and the findings of a walkover survey of the site.

The results of the soil contamination testing indicate that all of the contaminants tested for were below the Opus IHSV's version 2009.2 or the Laboratories Method Detection Limit for the phase 1 development area.

Based on the above, no contaminants of concern have been identified for the phase 1 study site.

However, asbestos has been detected in soil taken from made ground within exploratory hole WS2, which was located in the phase 2 development area, under the current driveway. The asbestos consisted of loose fibres. Therefore future site users could potentially be at risk from asbestos that could become exposed during the redevelopment works in this area of the site.

The presence of asbestos has been confirmed within one discrete location of the study site, within the made ground. The investigation has proven that a relatively thin layer of made ground exists beneath the site. Details on the recommended remedial strategy for asbestos contamination are provided in Section 8.2.1.

TPH results have been compared to the Opus IHSV's for the various BTEX compounds and also in terms of carbon banding and aliphatic / aromatic split, in accordance with the TPH CWG methodology from samples taken from surface spills around the current vehicle workshop area; these were below the Opus IHSV's version 2009.2.

Therefore in conclusion, based on the available data and findings to date, it is considered that remedial measures will be required with regard to human health risks, to ensure the safety of end users of the site.

The investigation proved an absence of Topsoil across much of the site, with near surface Made Ground (where present), including visually unacceptable content such as ash and brick fragments. It is therefore recommended that all gardens and soft landscaped areas should be provided with a suitable thickness of clean imported, or site won Topsoil (to a minimum thickness as required by NHBC regulations), to provide a growing medium for plants. Any Topsoil imported to the site for this purpose should be tested and assessed for potential contamination, ideally prior to importation.

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In addition to the above, it is noted that no radon protection measures are required for the proposed development.

8.2 Recommended Remedial Strategy

Based on the findings of this investigation, the following measures are considered necessary to be protective of the identified receptors:-

8.2.1 Protection of Human Health

Phase 1 Area

It is considered prudent, in areas that have been used for burning, that a surface scrape and removal of the ash, clinker, and partly burnt materials is undertaken at the commencement of the redevelopment, so as to prevent these materials from being spread across the site.

Phase 2 Area

It is recommended that further investigation is undertaken for the purpose of delineating the area of made ground potentially impacted by asbestos prior to development.

It is recommended that some further investigation is undertaken around the vehicle workshop area, where access was limited and areas of hydrocarbon stained soil were observed prior to development.

General

Should any unexpected significant contamination be encountered as development works progress, an appropriate remediation strategy should be formulated following inspection by a suitably qualified Geo-Environmental Engineer.

In addition to the above, site workers should adopt suitable health and safety measures to ensure protection of health for the duration of construction works, especially where operatives are likely to be coming into contact with soils.

It would be advisable to carry out all construction work with due regard to the potential for environmental impacts during construction. Any fuels and chemicals used during construction should be stored in an appropriate manner to prevent leaks and / or spillages from impacting the local environment. Any surface water runoff during construction will need to be controlled to prevent silt from entering adjacent watercourses.

Construction work should be planned to minimise any potential impacts to flora and fauna.

If soakaways are to be utilised on site, it will be necessary to consider potential impacts to controlled waters. An interceptor system should be included within any drainage system discharging to Soakaway, especially where runoff from parking areas is being discharged.

Prior to demolition of the structures in the phase 2 area, a full asbestos survey should be carried out and any identified Asbestos Containing materials (ACM's) should be removed from site by a qualified and competent contractor.

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Topsoil cover should be provided for all gardens and soft landscaped areas, in accordance with NHBC standards and any Topsoil imported to site for this purpose should be tested for potential contamination prior to import.

8.3 Re-Use of Arisings

The re-use of clean, natural materials (from say foundations etc.) on the site is generally acceptable provided that certain defined specific conditions are met. These conditions would include the material being "uncontaminated"; the material being suitable for use with no requirement for pre-treatment; there must be a certainty over the re-use and the quantities must be limited to those necessary for the specified works.

If re-use of arisings is envisaged, it will be essential to show that a material balance calculation has been carried out to allow for the re-use of the arisings, rather than simply creating 'landscape mounds'.

Additionally, there will be a requirement to show that there will be no environmental impact; this may well require a quantitative risk assessment, with regard to Controlled Waters and Human Health, depending on the nature of the contamination. A Waste Management Exemption or Material Management Plan is normally required where re-use of arisings or significant earthworks operations are envisaged.

With regard to the movement of materials between sites, the current Environment Agency policy is that any soil taken off a site and moved to another development site would be regarded as a waste. As such, the re-use of this material on sites other than that on which it had been generated would require a waste management license, or a registered exemption at the site where it was proposed for re-use.

8.4 Health & Safety

During the construction of the development, a high standard of health and safety awareness should be maintained in order to protect construction workers from exposure to potentially contaminated soil. It is therefore recommended that the appropriate precautions given in Health and Safety Executive Report HS(G)66 'Protection of workers and the general public during the redevelopment of contaminated land' are adopted.

Asbestos has been detected within one soil sample that was taken from the made ground in the phase 2 development area. Construction workers should be protected from exposure to asbestos containing materials during the development works. The appropriate guidance given in The Control of Asbestos Regulations 2012[CAR 2012] and more specifically Regulation 4 – The Duty to Manage Asbestos should be followed.

It is our judgement that The Construction Design and Management (CDM) Regulations 2007 (regulation 3) will apply to this project. As a designer, we have a responsibility to inform you of your duties to which you are subject by virtue of the Regulations as specified in regulation 11 (1).

We therefore draw your attention to the CDM Regulations 2007 and the Approved Codes of Practice contained therein.

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8.5 Waste Disposal

If any excavated soils are to be removed from site, it may be necessary to undertake Waste Acceptance Criteria (WAC) testing to classify the waste for disposal purposes. WAC analysis and waste classification is beyond the scope of works for this project.

8.6 Service Pipes

Given the history of the site and the low contamination levels reported, the use of standard plastic supply pipes (such as HDPE) may be appropriate, apart from those areas where hydrocarbon impacted soils have been observed, around the vehicle workshop area of the site. However, if further contamination is encountered during construction, protective measures will probably be required.

It is recommended that the water supply utility company is contacted for confirmation of pipe type prior to any construction work commencing on the site.

8.7 Regulatory Liaison

It is recommended that agreement to the above recommendations is sought from the Local Authority (Environmental Health and Planning) and the Environment Agency (where appropriate) prior to commencing work on site, especially where planning conditions relating to environmental assessment are outstanding for the proposed development.

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9 Geotechnical Design Criteria

9.1 General Earthworks

The current scheme design proposals indicate that building construction shall where possible reflect existing ground levels. Therefore, the need for mass excavation of the upper lying engineering soils, or for large volume deposition of earthwork materials to raise site levels, is not expected to be required. However, some materials will be won from excavations for service installation and foundations and some material is likely to be required to locally build up ground levels. Given the information from the ground investigation it is anticipated that:

i. Topsoil material may be designated as Acceptable Class 5 Topsoil material for reuse within the works, where testing has proven the deposit to be uncontaminated.

ii. The upper made ground deposits shall not generally be considered as acceptable structural fill, but where designated as uncontaminated (refer to Section 6.3), the material is considered suitable for reuse as a general Class 4 Landscape fill.

iii. Similar to the overlying made ground soils, the underlying natural soils where they are comprised of soft consistency, slightly sandy Clay deposits are believed to be suitable only for reuse as Class 4 Landscape fill.

iv. Where the natural clay soils exhibit a firm to stiff consistency, then the soil testing would indicate that materials won from excavations should be suitable for reuse as a Class 2b Dry Cohesive Fill. This material would be suitable for reuse as construction fill beneath areas of hard landscaping and general areas of construction make up. The material is not suitable for reuse beneath adoptable highway pavements, or for the backfilling of service trenches.

v. The natural granular soils are expected to represent an acceptable Class 1b uniformly graded general granular fill and may be reused as general infilling below landscaping, general hardstand, road pavements and backfill to service trenches.

vi. All materials won from the site strip and excavation works should be maintained in their "as-dug" condition and protected from excessive wetting or trafficking, which could increase their moisture content and reduce their strength. Poor treatment of the site won materials may, as a result, render them only suitable for use as Class 4 landscape fill.

9.2 Cuttings

The current scheme proposals indicate no requirement for permanent cutting slopes, and therefore, the subject is not discussed further within the scope of this report. Unmanned temporary cut slopes for the installation foundations and service trenches are expected to stand in a near vertical condition without support in the very short term. Temporary pump and sump dewatering may also be required on occasion to remove perched groundwater from the short term excavations.

9.3 Embankments

The current scheme proposals indicate no requirement for permanent embankment slopes, and therefore, the subject is not discussed further within the scope of this report. Generally where ground levels are required to be raised less than 500mm in height locally using site won structural

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fills it is advised that a maximum freestanding slope gradient of 1(v):2(h) should be used for design.

9.4 Road Pavements

The in-situ CBR values produced by the Clegg Impact Soil Tester provided values of 3% - 4% for the cohesive subgrade materials, and values of 5% - 7% for the granular soils. In comparison, the results of laboratory CBR tests on the cohesive soil samples gave values of between 1% - 2%. Generic guidance as given within HD25 Design Guidance for Road Pavement Foundations, suggest a CBR range for a sandy Clay (of P.I. 10% - 20%) lying between 2% and 4%. Based upon the results from the various CBR test methodologies, it is recommended that a CBR value of 3% be used for pavement design.

Accesses, estate roads, car parks and areas of hard landscaping shall require a capping layer to be included within the pavement design. To reduce the cost of pavement construction, and to reduce the adverse effect of site working within predominately clay soils during wet weather conditions, consideration may be given to the use of lime/cement soil stabilisation. This would reduce both the degree of initial excavation for pavement construction and the disposal volume of excavated spoil material from the reduced level strip.

9.5 Foundations Design

The expected building development is for the construction of lightly loaded, 2 storey residential properties. From consideration of the final development proposals, it is expected that the site ground conditions will allow for the installation of traditional concrete footings. The underside of foundations shall be seated on the natural ground soils, comprising firm clay at a minimum installation depth of 900mm.

Foundation depths are likely to require over deepening in those areas either where softer consistency clay is identified near surface, or owing to the need to take account of the proximity of surrounding trees to meet NHBC standards and Building Regulations.

The depth of over deepening of foundations, where existing or proposed tree planting lies within an influencing distance of those house units seated on clay foundation soils, will be dependent upon; the tree species; whether the trees are to remain or be removed; and the Low shrinkage potential of the clay soil.

From the ground investigation information, the occasional over deepening of foundations through the presence of soft ground to depths of 1.5m should be allowed for within the design.

As stated in section 9.2, foundation excavations should remain stable in the temporary condition where trench fill is considered in areas of foundation over deepening.

Where increased ground loading is required i.e. if 3 storey housing is considered, then vibro improvement may be considered in those areas not requiring foundation over deepening as a consequence of trees i.e.

Based upon an envisaged line load of 40kN for the building load will provide a ground load below a 600mm wide unreinforced strip footing of approximately 70kN/m² (assuming a ground bearing floor slab).

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An unreinforced concrete strip footing, of minimum 600mm width is estimated to provide a ULS Design Resistance of 307kN/m² and a SLS maximum net allowable ground bearing pressure of 80kN/m² for the underlying firm clay. This shall provide total foundation settlements of less than 25mm, with differential settlements across the building foundation of less than 12mm.

All formation surfaces should be proof rolled using a compaction roller/plate to locate soft ground, and all soft ground should be removed and replaced with lean/dry mix concrete.

As stated in section 9.2, temporary pump and sump dewatering is likely to be required to remove any ephemeral groundwater seepages during the excavation of foundation and service trenches.

Final designs for the foundations should be carried out by a suitably qualified Engineer, based on the findings of this investigation and with reference to the anticipated loadings and serviceability requirements for the structure.

9.6 Ground Floor Slab

Ground bearing floor slabs are considered acceptable for the majority of house plots after initial proof rolling to identify soft ground. The only areas requiring suspended floor slabs shall be those where the thickness of made ground is in excess of 600mm (generally identified in the northern area of the site) or where the presence of existing trees requires foundation over deepening in excess of 1.5m.

Final designs for the foundations should be carried out by a suitably qualified Engineer, based on the findings of this investigation and with reference to the anticipated loadings and serviceability requirements for the structure.

9.7 Building Near Trees

It is recommended that foundations and floor slab designs for the proposed development are fully adjusted to account for the shrinkage potential of cohesive strata and the influence of trees, shrubs and proposed plantings in accordance with NHBC Chapter 4.2..

The near surface clayey River Terrace Deposits strata encountered on the site have been proven to have a low volume change potential.

On the basis of site observations, it is noted that the influence of existing vegetation is likely to be restricted to the hedges and trees located around the boundaries of the site and within adjoining sites. However, careful consideration will also need to be given to the potential impact of any proposed planting.

Heave precautions may be required for relevant structures, dependant on the proximity, size and species of any adjacent trees.

9.8 Demolition and Construction

Where any significant obstructions (old foundations, drain runs etc.) are encountered during demolition works, these should be chased out and the position, extent and depth of any resultant voids should be recorded for future reference, as this could influence foundation designs for the proposed development. Where deep voids are to be in-filled, the advice of an Engineer should be

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sought to ensure that a suitable earthworks specification is achieved, so as to minimise impacts of designs for foundations / floor slabs etc.

It is generally anticipated that excavations within the near surface strata should be readily achieved using conventional plant (tracked excavator or similar). However, obstructions (old foundations, drain runs etc.) may be encountered, associated with previous phases of development and may require a higher specification of plant and /or breaking out.

Only occasional groundwater seepages were noted, lying at depths of between 1.3m and 2.0m begl. It was noted in TP5 that the groundwater level in the Soakaway test reached equilibrium at a depth of 1.015m begl. Whilst it is unknown whether the water strikes represent perched water seepage or the main groundwater system, the predominately cohesive nature of the ground soils is expected to reduce groundwater discharge into excavations. However, groundwater levels can vary throughout the year and if groundwater is encountered appropriate, dewatering techniques should be adopted as necessary.

9.9 Foundation Concrete

The results of the pH and water soluble sulphate analysis have been assessed for potential aggression to buried concrete in accordance with the Building Research Establishment: Special Digest 1: 2005 – Concrete in Aggressive Ground. It is considered, with reference to the desk study findings, that the site can be classified as a 'Brownfield site'.

In accordance with Part 1 of BRE : Special Digest 1, based on the testing carried out to date, it is considered that both Made Ground and natural materials at the site can be assigned Design Sulphate Class DS-1 and an ACEC (Aggressive Chemical Environment for Concrete) Class AC-1.

The specific concrete mixes for the Design Concrete Class (DCC) to be used on site will be determined by the site specific concrete requirements, in terms of their required durability and structural performance. These are assessed in terms of the Structural Performance Level (SPL) and any need for Additional Protective Measures (APM), detailed in Part 2 with further guidance in Parts 3 and 4 of BRE Special Digest 1.

9.10 Soil Infiltration for Drainage Design

The majority of the soil infiltration tests proved 'f' values of less than 1 x 10^{-7}m/s, which is considered to indicate the ground soils to be of low permeability. It is possible that further testing using the NHBC percolation test for the discharge of surface run off water from individual house plots may provide more optimistic infiltration rates for the discharge of small volumes of runoff water.

9.11 Design Recommendations

Any design recommendations made within this report are considered the most appropriate considering a number of factors, including investigation findings, financial and safety implications. All design recommendations are considered to be achievable within a safe system of work. During construction, due consideration should be given in relation to the safety implications inherent in the chosen construction method.

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Any design recommendations suggested within this report should be carried out in line with current best practice and regulatory requirements. It is considered that the contractor carrying out any recommendations contained within this report will be aware of the standard construction processes involved and have detailed knowledge of the relevant health and safety measures.

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10 Further Recommendations

The following further works have been recommended prior to the development of the site:

1. Finalisation of geotechnical designs for the proposed development, with reference to a finalised planning layout, dead and imposed structural loadings.
2. Full removal of all buried obstructions (such as footings) associated with the existing structures on site.
3. Asbestos survey and asbestos removal prior to demolition of existing structures.
4. Confirmation of the water supply pipe specification with the appropriate authorities prior to construction.
5. Testing of any fill/topsoil to be imported to site to confirm its suitability for re-use prior to import, especially when this is to be used in garden areas.
6. Further investigation is undertaken in the phase 2 area for the items below:

   For the purpose of delineating the area of made ground impacted by asbestos.

   Around the vehicle workshop area, where access was limited and areas of hydrocarbon stained soil were observed.

   Around the compound being used by the builder, where access was restricted.

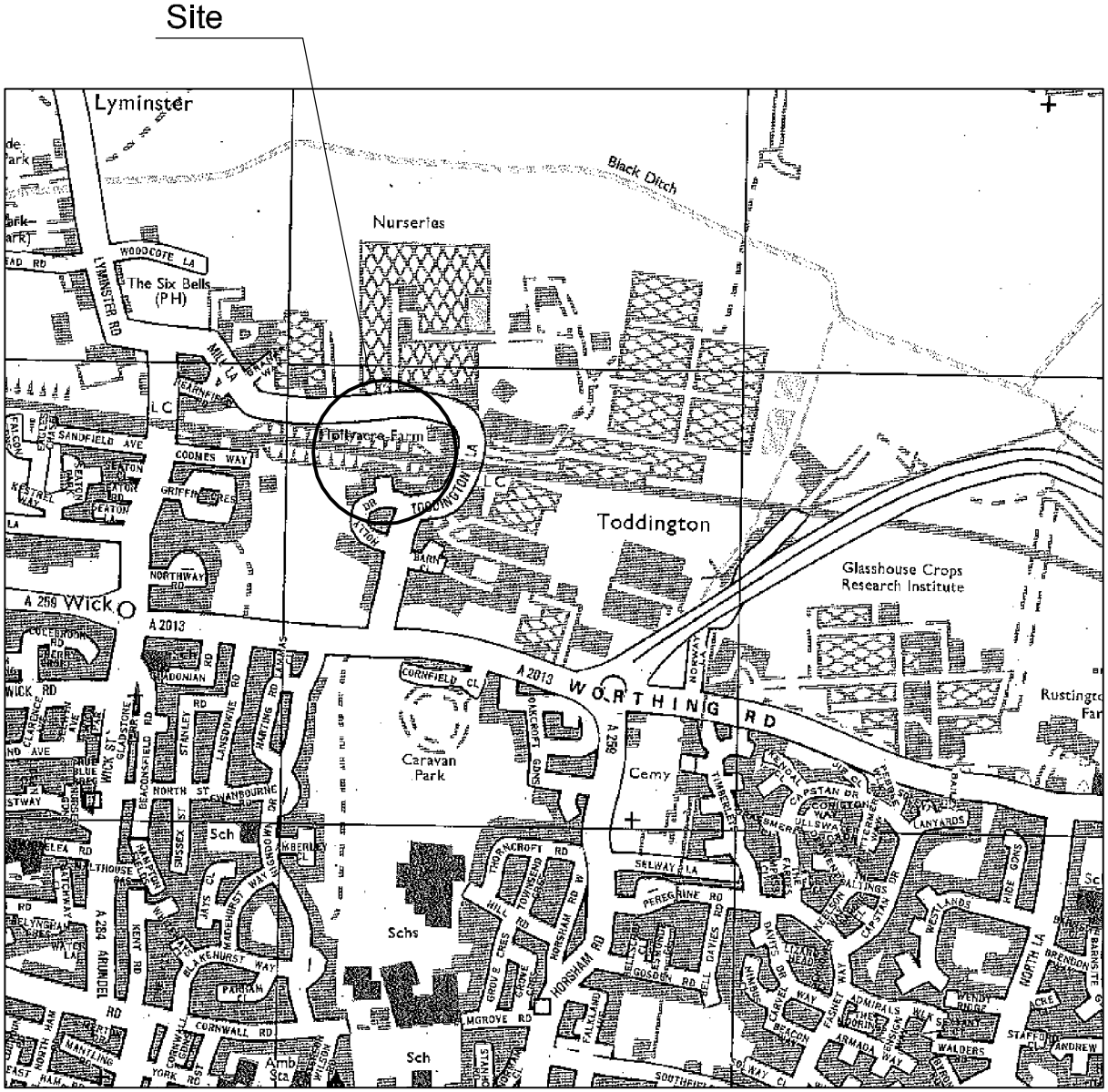
   A visual inspection of the ground conditions beneath the buildings should be made, especially in the vehicle workshop.

   A visual inspection and possible further investigation will be required to confirm that the soils located directly beneath the bunded fuel tank have not been impacted by hydrocarbons.
7. If discharge of small volumes of surface run off water from individual house plots is required on site. Carry out further testing using the NHBC percolation test to determine whether the ground conditions are suitable for use.

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DRAWINGS

ARUN DISTRICT COUNCIL LU/116/13/



Site Location Plan

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PRELIMINARY

Wilmington Homes Ltd

OPUS
Fareham Office
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Modulus House,
Salterns Lane, Fareham
Hampshire PO16 0QS

Project
HOLLYACRE
TODDINGTON LANE
LITTLEHAMPTON

Sheet
SITE LOCATION PLAN

Revision	Amendment	Approved	Date
P1	PRELIMINARY ISSUE	CDS	22.02.13

Drawn	Designed	Approved	Revision Date
MP	CDS	CDS	22.02.13

Project No.	Scale	Drawing No.	Sheet. No.	Revision
FA E-E1524.00	NTS	100		P1

Original Sheet Size A1 [210x297] Plot Date 2/22/2013 7:59 AM Path N:\Projects\GE1500-GE1599\GE1524\CAD\TEMP\FA E-E1524.00 100 P1.dwg

ARUN DISTRICT COUNCIL LU/11613/

JOINING PROPERTIES

TODDINGTON LANE

ADJOIN

TP11
WS13
TP12
WS14
WS1
WS12
TP3
TP2
TP6
WS3
WS2
TP10
TP7
WS4
WS11
WS8
TP5
TP4
TP1
WS6
WS5
TP9
HP2
WS10
WS9
TP8
WS7
HP1

150 mm
100
50
0
10 mm

NOTES:

1. This drawing is to be read in conjunction with all other OPUS INTERNATIONAL CONSULTANTS drawings, and any other relevant information.
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3. Unless noted otherwise all dimensions are in millimetres and all levels are in metres from the site datum.
4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. Figured dimensions must be used for setting out and detailing. OPUS logos and company information must be removed from copies if information is re-used.
5. The Contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of the existing buildings at all times.

KEY

- Locations of Window Sample Boreholes - OPUS January 2013
- Locations of Trial Pits - OPUS January 2013
- Location of Hand Dug Trial Pits - OPUS January 2013

Existing Site Plan
Showing Exploratory Hole Locations

PRELIMINARY

Revision	Amendment	Approved	Revision Date
P1	PRELIMINARY ISSUE	CDS	24.01.13

Wilmington Homes Ltd

OPUS
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Modulus House, Saltems Lane, Fareham Hampshire PO16 0QS

Drawn	Designed	Approved	Revision Date
MP	CDS	CDS	24.01.13

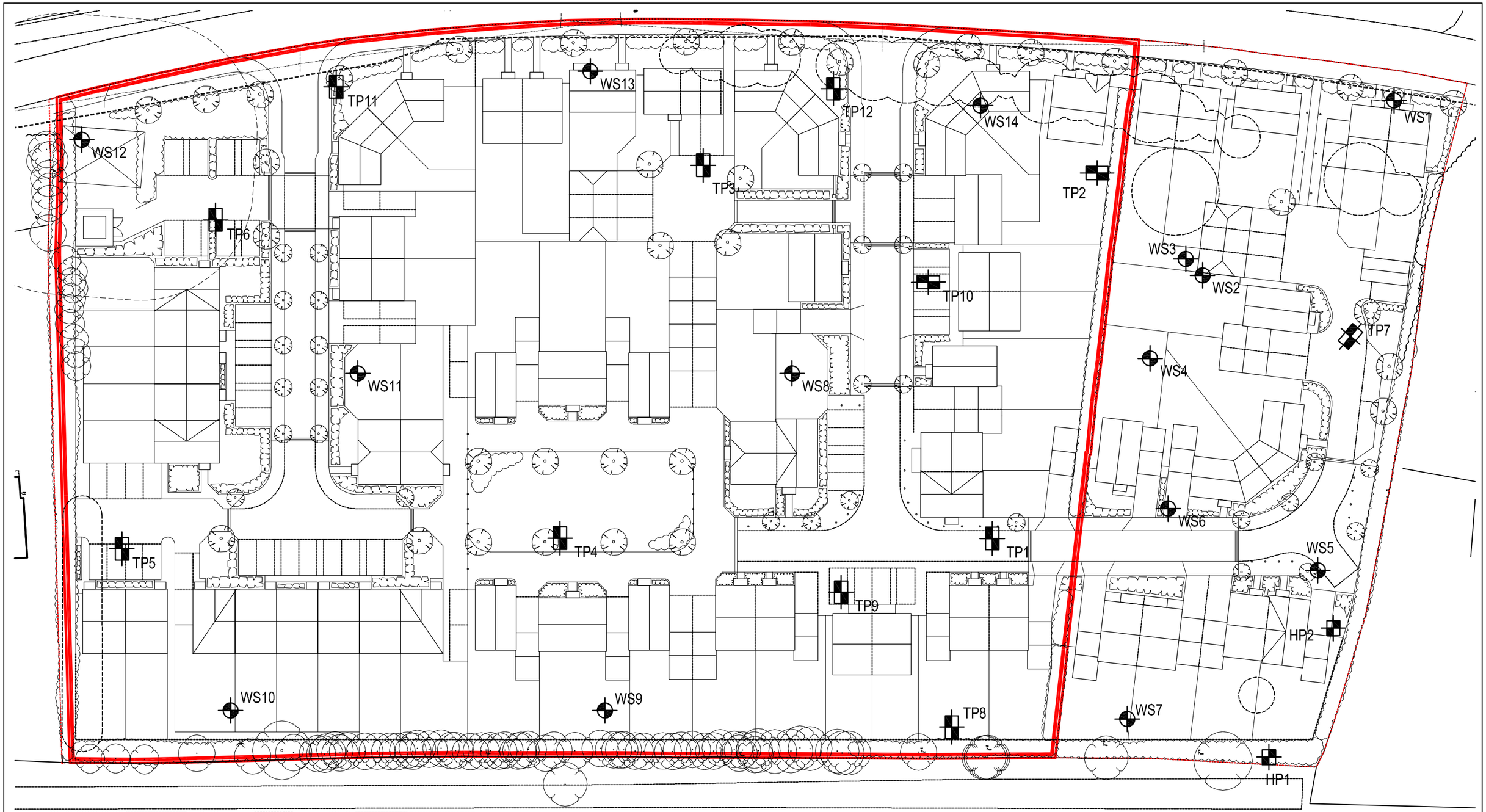
Project
HOLLYACRE
TODDINGTON LANE
LITTLEHAMPTON, WEST SUSSEX

Sheet
Exploratory Hole Location Plan
Existing Site Plan

Project No.	Scale	Drawing No.	Sheet No.	Revision
FA E-E1524.00	1:500	101		P1

Original Sheet Size A3 [420x297] Plot Date 22 Feb 2013 @ 8:01 AM Path N:\Projects\GE1500-GE1599\GE1524\CAD\TEMP\FA E-E1524.00 101-102 P1.dwg Existing 500

ARUN DISTRICT COUNCIL LU/116/3/



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4. The electronic information from this drawing can not be guaranteed as dimensionally drawn exact. Figured dimensions must be used for setting out and detailing. OPUS logos and company information must be removed from copies if information is re-used.
5. The Contractor is responsible for the design of all temporary works, and is also responsible for the safe maintenance and stability of the existing buildings at all times.

KEY

- Locations of Window Sample Boreholes - OPUS January 2013
- Locations of Trial Pits - OPUS January 2013
- Location of Hand Dug Trial Pits - OPUS January 2013

Proposed Site Plan
Showing Exploratory Hole Locations

PRELIMINARY

Revision	Amendment	Approved	Revision Date
P1	PRELIMINARY ISSUE	CDS	24.01.13

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Drawn	Designed	Approved	Revision Date
MP	CDS	CDS	24.01.13

Project
HOLLYACRE
TODDINGTON LANE
LITTLEHAMPTON, WEST SUSSEX

Sheet
Exploratory Hole Location Plan
Proposed Site Plan

Project No.	Scale	Drawing No.	Sheet No.	Revision
FA E-E1524.00	1:500	102		P1

Original Sheet Size A3 [420x297] Plot Date 22 Feb 2013 @ 8:02 AM Path N:\Projects\GE1500-GE1599\GE1524\CAD\TEMP\FA E-E1524.00 101-102 P1.dwg Proposed 500

APPENDIX A

Selected Site Photographs

ARUN DISTRICT COUNCIL LU/116/13/



Photograph 1: General view of TP1



Photograph 2: General view of arisings from TP1

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Photograph 3: General view of TP2



Photograph 4: General view of arisings from TP2

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Photograph 5: General view of TP3



Photograph 6: General view of arisings from TP3

ARUN DISTRICT COUNCIL LU/116/13/



Photograph 7: General view of TP4



Photograph 8: General view of arisings from TP4

ARUN DISTRICT COUNCIL LU/116/13/



Photrograph 9: General view of TP8



Photograph 10: General view of TP8 showing soakaway ditch to the north

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Photograph 11: General view of TP9



Photograph 12: General view of arisings from TP9

ARUN DISTRICT COUNCIL LU/116/13/



Photograph 13: general view of TP10



Photograph 14: General view of arisings from TP10

ARUN DISTRICT COUNCIL LU/116/13/



Photograph 15: General view of TP 11



Photograph 16: General view of arisings from TP11

ARUN DISTRICT COUNCIL LU/116/13/



Photograph 17: general view of TP12



Photograph 18: General view of arisings from TP12

ARUN DISTRICT COUNCIL LU/116/13/

APPENDIX B

Exploratory Hole Logs

ARUN DISTRICT COUNCIL LU/116/13/

Exploratory Hole ID:	Client:		
TP1	Wilmington Homes	OPUS	
	Site: Hollyacre, Toddington Lane	www.opusinternational.co.uk	
Job No: E-E1524.00		Start Date: 14/01/2013	End Date: 14/01/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 15/01/2013	Field Records:
	Ground Level (mAOD):	Logged: CDS / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising slightly gravelly, slightly clayey, dark brown fine to medium sand with rootlets. Gravel is subangular fine to medium of flint.				ES001	0.10			
	0.40							
Orange/medium brown slightly silty, slightly clayey SAND. Sand is fine to medium grained. (River Terrace Deposits)				ES002 B003	0.50			
	0.90							
Firm consistency orange/brown slightly silty, slightly sandy medium to high strength CLAY. Sand is fine to medium grained. (River Terrace Deposits)						V= 75 kPa V= 94 kPa		
				ES004 D005	2.00	V= 64 kPa		
	2.30							
Orange slightly clayey slightly gravelly SAND. Sand is fine to medium grained. Gravel is angular fine to medium of flint. (River Terrace Deposits)								
	2.71							
End of Exploratory Hole at 2.71 m								

Remarks:
1. Groundwater not encountered in the explorotory hole.
2. Explorotory hole sides stable.
3. Permeability test undertaken in the trial pit.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP2	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

OPUS
www.opusinternational.co.uk

Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		14/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising orange sandy, clayey, gravel. Sand is fine to coarse grained. Gravel is subrounded to rounded fine to coarse of flint.	0.10			ES001	0.05			
Firm consistency medium brown slightly silty sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)				ES002	0.80			
				D003	1.00	V= 54 kPa V= 56 kPa V= 54 kPa		
Firm consistency orange slightly silty sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)	1.60			ES004 D005	2.10	V= 58 kPa V= 63 kPa V= 64 kPa		
Orange slightly clayey slightly gravelly SAND. Sand is fine to coarse grained. Gravel is subangular to rounded fine to coarse of flint. (River Terrace Deposits)	2.45							
End of Exploratory Hole at 3.10 m	3.10							

Remarks:
1. Groundwater not encountered in the explorotory hole.
2. Explorotory hole sides stable.
3. Permeability test undertaken in the trial pit.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP3	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

OPUS
www.opusinternational.co.uk

Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising white/grey/brown subangular to subrounded fime to medium gravel.	0.04			ES001	0.05			
MADE GROUND: comprising buff fine to coarse grained sand.	0.10							
Firm to stiff consistency grey/brown silty, slightly sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits).	0.50			B003 ES002	0.50-0.60 0.60	V= 72 kPa V= 68 kPa V= 74 kPa		
Firm consistency orange slightly silty sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)				D003	1.25	V= 52 kPa V= 56 kPa V= 58 kPa		
				ES004 D005	2.00	V= 60 kPa V= 58 kPa V= 62 kPa		
Orange very slightly clayey gravelly SAND. Sand is fine to coarse grained. Gravel is subrounded to rounded fine to coarse of flint. (River Terrace Deposits)	2.50							
End of Exploratory Hole at 3.24 m	3.24							

Remarks:
1. Groundwater not encountered in the explorotory hole.
2. Explorotory hole sides stable.
3. Permeability test undertaken in the trial pit. The noncohesive sand deposits slumped into the base of the trial pit during the test and the final base depth was recorded at 2.66m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP4	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

OPUS
www.opusinternational.co.uk

Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising dark grey silty sandy clay, sand is fine to coarse grained. Short sections of wire sheethed inred plastic were observed at 0.50m.				ES001	0.05			
Firm medium brown/orange consistency slightly silty, slightly sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)	0.50			ES002	0.50	V= 47 kPa V= 54 kPa V= 49 kPa		
Becoming high strength clay from 1.20m onwards.				ES003 B004	1.20	V= 74 kPa V= 84 kPa V= 86 kPa		
Firm consistency brown slightly sandy high strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)	2.00			D005	2.00	V= 82 kPa V= 86 kPa V= 74 kPa		
Orange slightly clayey, slightly gravelly CLAY. Sand is fine to coarse grained. Gravel is subrounded fine to coarse of flint. (River Terrace Deposits)	2.30							
Structureless CHALK composed of uncompact cream slightly gravelly sandy SILT. Gravel is weak rounded low density and white. (Grade Dm) (New Pit Chalk Formation)	2.80 2.85							
End of Exploratory Hole at 2.85 m								

Remarks:
1. Groundwater not encountered in the explorotory hole.
2. Explorotory hole sides stable.
3. Permeability test undertaken in the trial pit.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP5	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

OPUS
www.opusinternational.co.uk

Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising white/grey/brown subangular to subrounded fine to medium flint gravel.	0.05							
MADE GROUND: comprising buff fine to coarse grained sand.	0.10			ES001	0.20			
Firm consistency medium brown/orange slightly silty, slightly sandy medium strength CLAY. Sand is fine to coarse grained.(River Terrace Deposits)				B002	0.70	V= 54 kPa V= 64 kPa V= 62 kPa	1.20 ▽	
Firm consistency orange/brown slightly silty sandy CLAY. Sand is fine to coarse grained. (River Terrace Deposits)	1.75					V= 56 kPa V= 64 kPa V= 56 kPa	1.80 ▽	
End of Exploratory Hole at 2.41 m	2.41							

Remarks:
1. Seepage of groundwater from the sides of the excavation at 1.2m and 1.8m begl.
2. Long sides of excavation underbreak collapse at vertical fissures in clay from 1.2 to the base of the excavation.
3. Permeability test undertaken in the trial pit. Water level rose to 1.015m begl overnight and remained at this level during the second day of the test.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP6	Wilmington Homes	OPUS	
	Site: Hollyacre, Toddington Lane	www.opusinternational.co.uk	
Job No: E-E1524.00		Start Date: 14/01/2013	End Date: 14/01/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 15/01/2013	Field Records:
	Ground Level (mAOD):	Logged: CDS / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Comprising white/brown/grey subangular to subrounded fine to medium flint gravel.	0.03							
MADE GROUND: comprising light brown fine to coarse grained sand on a plastic membrane.	0.12			ES001	0.25			
Grey with red veins silty slightly sandy CLAY. Sand is fine to coarse grained. (River Terrace Deposits)	0.40			B002	0.70			
Firm consistency medium brown/orange slightly silty slightly sandy high strength CLAY. Sand is fine to medium grained. (River Terrace Deposits)						V= 76 kPa V= 86 kPa V= 78 kPa		
Firm consistency medium orange/brown slightly silty sandy CLAY. Sand is fine to medium grained. (River Terrace Deposits)	1.75					V= 72 kPa V= 74 kPa V= 76 kPa		
Orange/brown slightly clayey fine to coarse grained SAND. (River Terrace Deposits)	2.40							
Orange/brown slightly clayey slightly gravelly SAND. Sand is fine to coarse grained. Gravel is subangular to subrounded fine to coarse of flint. (River Terrace Deposits)	2.70 2.78							
End of Exploratory Hole at 2.78 m								

Remarks:
1. Groundwater not encountered during excavation of the explorotory trial pit.
2. Explorotory hole ecavation sides stable.
3. Permeability test undertaken in the trial pit. Water level rose to 1.630m begl overnight and remained a t this level during the second day of the test.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP7	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

OPUS
www.opusinternational.co.uk

Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising brown black white sandy gravel. Sand is fine to coarse grained. Gravel is sub rounded to rounded fine to coarse flint.	0.15			ES001	0.08			
				ES002	0.25			
MADE GROUND: comprising brown/grey silty sandy clay. Sand is fine to coarse grained.	0.35			B003	0.50			
Firm consistency orange/medium brown slightly silty slightly sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)								
Orange slightly gravelly fine to coarse grained SAND. Gravel is subangular to subrounded fine to coarse flint. (River Terrace Deposits)	1.40							
End of Exploratory Hole at 2.59 m	2.59							

Remarks:
1. Groundwater not encountered in the explorotory hole.
2. Explorotory excavation hole sides stable.
3. Permeability test undertaken in the trial pit, the noncohesive sand deposits slumped into the base of the trial pit during the test and the final base depth of the pit was 2.15m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP8	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is rounded fine to coarse.	0.23			ES001	0.15			
MADE GROUND: comprising firm consistencyorange/brown slightly silty sandy clay. Sand is fine to coarse grained. Occasional angular brick fragments.	0.55			ES002	0.50			
Firm consistency orange/brown slightly silty slightly sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)				ES003 B004	1.05	V= 56 kPa V= 68 kPa V= 60 kPa V= 76 kPa V= 72 kPa V= 64 kPa		
Orange slightly gravelly fine to coarse grained SAND. Gravel is subangular to subrounded fine to medium of flint. (RIver Terrace Deposits)	2.25			ES005 B006	2.80			
End of Exploratory Hole at 3.40 m	3.40							

Remarks:
1. Hole excavated adjacent to soakaway trench.
2. Seepage noted into the base of the trial pit, potentially from the soakaway trench adjacent.
3. Trial pit excavation sides stable.
4. Trial pit excavated through an area used for burning waste packaging materials.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP9	Wilmington Homes		
	Site: Hollyacre, Toddington Lane		
Job No: E-E1524.00		Start Date: 15/01/2013	End Date: 15/01/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 15/01/2013	Field Records:
	Ground Level (mAOD):	Logged: CDS / Chkd: / Appr:	

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Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising light grey white/brown subangular to subrounded to fine flint gravel.	0.03			ES001	0.05			
MADE GROUND: comprising light orange fine to coarse sand.	0.10							
Black plastic sheet.				ES002	0.50			
MADEGROUND: comprising dark grey silty slightly sandy clay. Sand is fine to coarse grained. Piece of plastic noted at base of stratum.	0.60							
Firm consistency dark grey silty slightly sandy high strength CLAY. Sand is fine to coarse grained sand. (River Terrace Deposits)				ES003 B004	1.00	V= 78 kPa V= 70 kPa V= 84 kPa		
Firm consistency medium brown/orange slightly silty slightly sandy high strength CLAY. (River Terrace Deposits)	1.70			ES005 D006	1.80	V= 86 kPa V= 92 kPa V= 94 kPa		
Orange fine to coarse grained SAND. (River Terrace Deposits)	2.50							
End of Exploratory Hole at 2.65 m	2.65							

Remarks:
1. Groundwater not encountered the trial pit.
2. Trial pit excavation sides stable.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
TP10	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising grey/white brown subangular to subrounded fine to medium flint gravel.	0.05			ES001	0.08			
MADE GROUND: comprising light orange fine to coarse sand.	0.15							
Black plastic membrane.				ES002	0.45			
				B003	0.50			
Firm/stiff consistency grey with red veins silty slightly sandy CLAY. Sand is fine to coarse grained. (River Terrace Deposits)	0.80							
				ES004	1.00	V= 110 kPa V= 112 kPa V= 110 kPa		
Firm/stiff consistency orange/ medium brown slightly silty slightly sandy high strength CLAY. Sand is fine to coarse grained. (river Terrace Deposits)	1.20			D005				
Firm consistency orange/medium brown slightly silty sandy medium strength CLAY. Sand is fine to coarse grained. (River Terrace Deposits)						V= 72 kPa V= 74 kPa V= 74 kPa		
Orange slightly clayey slightly gravelly SAND. Sand is fine to coarse grained. Gravel is subrounded to rounded fine to coarse of flint. (River Terrace Deposits)	1.90							
				B006	3.10			
End of Exploratory Hole at 3.20 m	3.20							

Remarks:
1. Groundwater not encountered in the explorotory trial pit.
2. Trial pit excavation sides stable.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet:
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Exploratory Hole ID:	Client:	
TP11	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: orange brown clayey sandy gravel, Sand is fine to coarse grained. Gravel is subrounded to rounded fine to coarse of flint.	0.10							
MADE GROUND: comprising medium brown slighty silty sandy slightly graveely clay. Sand is fine to coarse grained. Gravel is angular to subrounded fine to coarse of flint with rare whole brick cobbles.				ES001	0.50			
Firm consistency orange/medium brown slightly silty slightly sandy high strength CLAY. (River Terrace Deposits)	1.05			ES002 B003	1.10 1.15	V= 80 kPa V= 82 kPa V= 80 kPa V= 100 kPa V= 94 kPa V= 106 kPa		
Orange slightly clayey slighly gravelly SAND. Sand is fine to coarse grained. Gravel is subangular to subrounded fine to coarse of flint. (River Terrace Deposits)	2.00			B004	2.40			
End of Exploratory Hole at 2.50 m	2.50							

Remarks:
1. Groundwater not encountered in the trial pit.
2. Trial pit excavation sides stable

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet:
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Exploratory Hole ID:	Client:	
TP12	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
JCB 3CX		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	CDS		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: comprising dark brown clayey sandy gravel. Sand is fine to coarse grained. Gravel is subrounded to rounded fine to coarse of flint.	0.20			ES001	0.10			
Firm consistency orange/medium brown slightly silty sandy CLAY. Sand is fine to coarse grained. (River Terrace Deposits)				ES002	0.50			
				B003	0.80			
				B004	1.40	V= 62 kPa V= 64 kPa V= 60 kPa		
Orange slightly gravelly SAND. Sand is fine to coarse grained. Gravel is subangular to subrounded fine to coarse of flint. (River Terrace Deposits)	2.00			B005	2.10			
End of Exploratory Hole at 2.30 m	2.30							

Remarks:
1. Groundwater not encountered in the trial pit.
2. Trial pit excavation sides stable

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
ES - Environmental Sample	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	
P - Piston Sample	

Sheet:
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Exploratory Hole ID:	Client:	
HP1	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Hand Excavated Pit		14/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Slightly silty, very sandy, firm consistency, reddish brown CLAY. Strong hydrocarbon odour. (RIVER TERRACE DEPOSITS)				ES001	0.10			
				ES002	0.30			
Slightly silty, slightly sandy, soft to firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS) Becoming very sandy at 0.9m bgl.	0.65			ES003	0.65			
				ES004	1.10			
End of Exploratory Hole at 1.20 m	1.20							

Remarks:
1. Hand Pit excavated to a depth of 1.2m begl.
2. No groundwater encountered.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
HP2	Wilmington Homes	OPUS	
	Site: Hollyacre, Toddington Lane	www.opusinternational.co.uk	
Job No: E-E1524.00		Start Date: 14/01/2013	End Date: 14/01/2013
Drilling Equipment/ Excavation Method: Hand Excavated Pit	Co-ords:	Backfill Date: 14/01/2013	Field Records:
	Ground Level (mAOD):	Logged: SMD	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Fine to medium, dark brown/black gravel. Gravel comprises angular to subrounded quartzite and brick. Hydrocarbon odour and staining.	0.25			ES001	0.10			
				ES002	0.30			
MADE GROUND: Fine to coarse, dark grey/brown gravel. Gravel comprises angular to subrounded quartzite, flint, limestone and brick. Hydrocarbon odour.	0.45			ES003	0.50			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. Hydrocarbon Odour. (RIVER TERRACE DEPOSITS)				ES004	1.00			
End of Exploratory Hole at 1.20 m	1.20							

Remarks:
1. Hand Pit excavated to a depth of 1.2m begl.
2. No groundwater encountered.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:	
WS1	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		14/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Turf over slightly clayey, dark brown, fine to medium sand with rootlets. (TOPSOIL)								
MADE GROUND: Slightly gravelly, soft consistency, brown clay. Gravel comprises fine to medium, subangular qaurtzite.	0.35			ES001	0.35			
MADE GROUND: Sandy, firm to stiff consistency, light brown clay.	0.65 0.80			ES002	0.70			
MADE GROUND: Clayey, very sandy, fine to coarse, dark brown gravel. Gravel comprises angular to subrounded brick, concrete, flint, quartzite and limestone.	1.10					N=6(S)		
Slightly silty, slightly sandy, soft to firm consistency, brown CLAY. (RIVER TERRACE DEPOSITS)				ES003	1.30			
Slightly silty, slightly sandy, firm to stiff consistency, light orange brown CLAY. (RIVER TERRACE DEPOSITS)	1.80			D004	1.90	N=6(S)		
Gravelly, firm to stiff consistency, orange brown CLAY. Gravel comprises fine to medium subangular chalk. (RIVER TERRACE DEPOSITS)	2.35			D005	2.35			
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)	2.70			D006	2.90	N=31(S)		
				D007	3.80	N=51(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:	
WS2	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		14/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete blocks.	0.07							
MADE GROUND: Sandy, fine to coarse, brown gravel. Gravel comprises angular to subrounded brick, concrete and quartzite.				ES001	0.30			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	0.50			ES002	0.60			
Becoming soft consistency at 1.0m bgl.						N=9(S)		
							1.30 ▽	
				ES003	1.50			
Slightly gravelly, fine to coarse, orange brown SAND. Gravel comprises fine to coarse, angular flint. (RIVER TERRACE DEPOSITS)	1.70			ES004	1.80			
No Recovery	2.00					N=15(S)		
No Recovery	3.00					N=25(S)		
Gravelly, firm to stiff consistency, orange brown CLAY. Gravel comprises fine to medium subangular chalk. (RIVER TERRACE DEPOSITS)	3.60			D005	3.70			
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)	3.80					N=29(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. Groundwater encountered at 1.6m begl.
3. WS terminated at 4.45m begl.
4. Monitoring well installed to 4.0m begl as detailed above.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID: WS3	Client: Wilmington Homes	OPUS www.opusinternational.co.uk	
	Site: Hollyacre, Toddington Lane		
Job No: E-E1524.00		Start Date: 14/01/2013	End Date: 14/01/2013
Drilling Equipment/ Excavation Method: Tracked Window Sampling Rig	Co-ords:	Backfill Date: 14/01/2013	Field Records:
	Ground Level (mAOD):	Logged: SMD / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Turf over slightly clayey, dark brown, fine to medium sand with rootlets. (TOPSOIL)								
	0.35			ES001	0.40			
Slightly silty, slightly sandy, soft consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)				ES002	0.80			
Becoming firm consistency at 1.0m bgl.				D003	1.50			
	2.80			D004	2.80			
Gravelly, firm to stiff consistency, orange brown CLAY. Gravel comprises fine to medium subangular chalk. (RIVER TERRACE DEPOSITS)								
	3.50			D005	3.50			
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)				D006	3.70			
	4.00							
End of Exploratory Hole at 4.00 m								

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.0m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS4	Wilmington Homes	OPUS
	Site: Hollyacre, Toddington Lane	www.opusinternational.co.uk
Job No: E-E1524.00	Start Date: 14/01/2013	End Date: 14/01/2013
Drilling Equipment/ Excavation Method: Tracked Window Sampling Rig	Co-ords:	Backfill Date: 14/01/2013
	Ground Level (mAOD):	Logged: SMD / Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete blocks.	0.07							
MADE GROUND: Sandy, fine to coarse, brown gravel. Gravel comprises angular to subrounded brick, concrete and quartzite.	0.25			ES001	0.30			
				D002	0.50			
Firm to stiff consitency, dark greyish brown CLAY. (RIVER TERRACE DEPOSITS)	0.65			ES003	0.70			
Slightly silty, slightly sandy, firm to stiff consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)						N=7(S)		
Very clayey, fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	1.25			ES004	1.30			
Fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	1.60 1.75							
Slightly clayey, fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	2.00					N=26(S)		
Medium dense slightly gravelly, fine to coarse, orange brown SAND. Gravel comprises fine to coarse, angular flint. (RIVER TERRACE DEPOSITS)				D005	2.50			
Slightly gravelly, slightly sandy, firm to stiff consistency, orange brown CLAY. Gravel comprises fine to medium, angular flint. (RIVER TERRACE DEPOSITS)	2.75			D006	2.90	N=29(S)		
Dense slightly gravelly, fine to coarse, orange brown SAND. Gravel comprises fine to medium, angular flint. (RIVER TERRACE DEPOSITS)	3.50					N=34(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:	
WS5	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		14/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete blocks.	0.07							
MADE GROUND: Sandy, fine to coarse, brown gravel. Gravel comprises angular to subrounded brick, flint and quartzite.	0.20			ES001	0.30			
				D002	0.50			
Slightly silty, slightly sandy, firm to stiff consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	0.75			ES003	0.75			
Slightly silty, slightly sandy, soft consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)						N=8(S)		
Becoming firm consistency at 1.5m bgl.				D004	1.50		1.50 ▽	
Becoming stiff consistency at 2.0m bgl.						N=10(S)		
				D005	2.50			
Becoming soft consistency at 2.7m bgl.	2.80							
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)				D006	3.00	N=23(S)		
						N=34(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. Groundwater encountered at 1.6m begl.
3. WS terminated at 4.45m begl.
4. Monitoring well installed to 4.0m begl as detailed above.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:	
WS6	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	14/01/2013	14/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		14/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Concrete blocks.	0.07							
MADE GROUND: Sandy, fine to coarse, brown gravel. Gravel comprises angular to subrounded brick, flint and quartzite.	0.20			ES001	0.30			
Slightly silty, slightly sandy, firm to stiff consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS)	0.45			ES002	0.50			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)						N=7(S)		
Becoming slightly gravelly at 1.2m bgl.				ES003	1.50		1.60 ▽	
						N=19(S)		
Medium dense slightly gravelly, fine to coarse, orange brown SAND. Gravel comprises fine to medium, angular flint. (RIVER TERRACE DEPOSITS)	2.30			D004	2.40			
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)	2.95					N=31(S)		
				D005	3.30			
						N=25(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. Groundwater encountered at 1.6m begl.
3. WS terminated at 4.45m begl.
4. Monitoring well installed to 4.0m begl as detailed above.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS7	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Turf over slightly clayey, dark brown, fine to medium sand with rootlets. (TOPSOIL)								
	0.25							
Slightly silty, slightly sandy, soft consistency, dark orange brown CLAY. (RIVER TERRACE DEPOSITS)				ES001	0.30			
				ES002	1.00	N=5(S)		
Becoming firm consistency at 1.5m bgl.				ES003	1.60			
	2.00					N=13(S)		
Slightly silty, slightly sandy, soft consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)				D004	2.10			
						N=17(S)		
	3.20							
Medium dense fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)								
	4.00					N=16(S)		
End of Exploratory Hole at 4.45 m								

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS8	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Fine to medium, light orange brown gravel. Gravel comprises subrounded quartzite.	0.20							
Slightly silty, slightly sandy, firm consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS)				ES001	0.40			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	0.90			ES002	0.90	N=8(S)		
				D003	1.50			
						N=5(S)		
Soft consistency from 2.6m to 2.7m bgl.								
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)	2.95					N=21(S)		
				D004	3.20			
End of Exploratory Hole at 4.45 m	4.00					N=36(S)		

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS9	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Fine to medium, light orange brown gravel. Gravel comprises subrounded quartzite.								
Slightly silty, slightly sandy, firm consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS)	0.25			ES001	0.30			
				ES002	0.75			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	0.85			ES003	1.20	N=6(S)		
Slightly silty, slightly sandy, firm consistency, bright orange brown CLAY. (RIVER TERRACE DEPOSITS)	2.00			D004	2.10	N=11(S)		
Fine to coarse, bright orange brown SAND. (RIVER TERRACE DEPOSITS)	2.60							
Slightly silty, very sandy, firm consistency, bright orange brown CLAY. (RIVER TERRACE DEPOSITS)	2.75			D005	2.80	N=7(S)		
Structureless CHALK composed of silty subangular GRAVEL. Clasts are weak, white with occasional orange-brown staining. Matrix is off-white and white. (Grade Dc). (NEW PIT CHALK FORMATION)	3.80					N=38(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS10	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Fine to medium, light orange brown gravel. Gravel comprises subrounded quartzite.	0.25			ES001	0.30			
Slightly silty, very sandy, firm consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS)				ES002	0.70			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	1.00			ES003	1.10	N=7(S)		
				D004	1.80			
				D005	2.10	N=12(S)		
Fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	2.60							
Slightly silty, very sandy fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	2.90			D006	3.00	N=21(S)		
Medium dense fine to medium, orange brown SAND. (RIVER TERRACE DEPOSITS)	3.60					N=11(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. Groundwater encountered at 2.0m begl.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS11	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Fine to medium, light orange brown gravel. Gravel comprises subrounded quartzite.	0.20							
Slightly silty, sandy, firm consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS)				ES001	0.30			
				ES002	0.70			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	0.95			ES003	1.10	N=6(S)		
				D004	1.80			
Slightly silty, slightly sandy, soft consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	2.00			D005	2.10	N=16(S)		
Slightly silty, sligtly sandy fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	2.30							
Slightly silty, slightly sandy, soft consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	2.90			D006	3.00	N=25(S)		
Slightly silty, slightly clayey fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)	3.50					N=36(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS12	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Gravelly, slightly silty, slightly sandy, firm consistency, reddish brown clay. Gravel comprises fine to coarse, rounded to subangular flint, sandstone, quartzite and chalk.				ES001	0.20			
	0.40							
Slightly silty, slightly sandy, slightly gravelly, firm consistency, orange brown CLAY. Gravel comprises rare fine, subangular to subrounded quartzite and chalk. (RIVER TERRACE DEPOSITS)				ES002	0.60			
						N=8(S)		
	1.10							
Slightly silty, sandy, firm consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS)				ES003	1.20			
	1.90							
Medium dense slightly silty, slightly clayey fine to coarse, orange brown SAND. (RIVER TERRACE DEPOSITS)				ES004	2.00	N=29(S)		
	2.50							
Medium dense slightly gravelly, fine to medium, orange brown SAND. Gravel comprises fine to medium, angular flint. (RIVER TERRACE DEPOSITS)								
						N=64(S)		
Becoming very dense from 3.00m onwards.								
						N=68(S)		
	4.40							
End of Exploratory Hole at 4.40 m								

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.40m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS13	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Fine to medium, light orange brown gravel. Gravel comprises subrounded quartzite.	0.20							
MADE GROUND: Gravelly, slightly silty, slightly sandy, firm consistency, reddish brown clay. Gravel comprises fine to coarse, rounded to subangular flint, sandstone, quartzite, brick, wood and chalk.				ES001	0.25			
				ES002	0.60			
	0.80			ES003	0.85			
Slightly silty, slightly sandy, slightly gravelly, soft consistency, orange brown CLAY. Gravel comprises rare fine, subangular to subrounded quartzite and chalk. (RIVER TERRACE DEPOSITS)						N=5(S)		
Becoming firm consistency at 1.75m bgl.				D004	1.70			
	2.05					N=18(S)		
Medium dense slightly gravelly, fine to medium, orange SAND. Gravel comprises fine to medium, angular flint. (RIVER TERRACE DEPOSITS)				D005	2.20			
						N=33(S)		
						N=25(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet:
Sheet 1 of 1

Exploratory Hole ID:	Client:	
WS14	Wilmington Homes	
	Site: Hollyacre, Toddington Lane	

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Job No:	Start Date:	End Date:
E-E1524.00	15/01/2013	15/01/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked Window Sampling Rig		15/01/2013	

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	SMD		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Gravelly, slightly silty, slightly sandy, firm consistency, reddish brown clay. Gravel comprises fine to coarse, rounded to subangular flint, sandstone, quartzite, brick and wood.	0.20			ES001	0.25			
Slightly silty, sandy, firm consistency, reddish brown CLAY. (RIVER TERRACE DEPOSITS) Becoming soft consistency at 0.6m bgl.				ES002	0.70			
Slightly silty, slightly sandy, firm consistency, orange brown CLAY. (RIVER TERRACE DEPOSITS)	1.00			ES003	1.10	N=9(S)		
						N=10(S)		
Slightly silty, slightly sandy, slightly gravelly, soft consistency, orange brown CLAY. Gravel comprises rare fine, subangular to subrounded quartzite and chalk. (RIVER TERRACE DEPOSITS)	2.30			D004	2.40			
						N=45(S)		
						N=51(S)		
End of Exploratory Hole at 4.45 m	4.45							

Remarks:
1. SPT 'N' values corrected to a N60 value in accordance with BS EN 22476 Part 3 and where appropriate extrapolated for partial penetration.
2. No groundwater encountered.
3. WS terminated at 4.45m begl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

APPENDIX C

Contamination Test Results and Assessment Criteria

ARUN DISTRICT COUNCIL LU/116/13/

Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

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Tel : 0161 874 2400
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Report Number: Supplement to 313199-1

Date of Report: 06-Feb-2013

Customer: OPUS International Consultants (UK) Ltd.
Modulus House
Salterns Lane
Fareham
Hampshire
PO16 0QS

Customer Contact: Mr Chris Summers

Customer Job Reference: E-E1524
Customer Purchase Order: FA00156
Date Job Received at SAL: 24-Jan-2013
Date Analysis Started: 29-Jan-2013
Date Analysis Completed: 05-Feb-2013

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22

UKAS TESTING
1549

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Caroline Haworth
Assistant Customer Service
Manager

Issued by :
Caroline Haworth
Assistant Customer Service
Manager

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 001**	**313199 002**	**313199 004**	**313199 007**	**313199 008**
				Customer Sample Reference	**TP1 0.1M**	**TP1 0.5M**	**TP2 0.05M**	**TP3 0.05M**	**TP3 0.60M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.5**	**0.05**	**0.05**	**0.60**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture	T277	AR	0.1	%	**19**	**19**	**9.3**	**10**	**17**
Moisture @ 105 C	T162	AR	0.1	%	**19**	**20**	**13**	**9.3**	**18**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 010**	**313199 013**	**313199 015**	**313199 017**	**313199 018**
				Customer Sample Reference	**TP4 0.05M**	**TP5 0.20M**	**TP7 0.075M**	**TP8 0.15M**	**TP8 0.50M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.20**	**0.075**	**0.15**	**0.50**
				Type	**Sandy Soil**	**Clay**	**Fill**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture	T277	AR	0.1	%	**10**	**21**	**10**	**9.8**	**20**
Moisture @ 105 C	T162	AR	0.1	%	**9.8**	**22**	**9.2**	**14**	**20**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 021**	**313199 022**	**313199 025**	**313199 028**	**313199 030**
				Customer Sample Reference	**TP9 0.05M**	**TP9 0.50M**	**TP10 0.075M**	**TP11 0.50M**	**TP12 0.10M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.50**	**0.075**	**0.50**	**0.10**
				Type	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture	T277	AR	0.1	%	**13**	**26**	**12**	**17**	**7.5**
Moisture @ 105 C	T162	AR	0.1	%	**13**	**25**	**12**	**18**	**9.1**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 032**	**313199 035**	**313199 037**	**313199 039**	**313199 040**
				Customer Sample Reference	**WS1 0.35M**	**WS2 0.30M**	**WS2 1.50M**	**WS3 0.40M**	**WS3 0.80M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.35**	**0.30**	**1.50**	**0.40**	**0.80**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture	T277	AR	0.1	%	**23**	**14**	**16**	**20**	**18**
Moisture @ 105 C	T162	AR	0.1	%	**24**	**14**	**18**	**21**	**19**

ARUN DISTRICT COUNCIL LU/116/13/

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 044**	**313199 045**	**313199 046**	**313199 049**	**313199 055**
				Customer Sample Reference	**WS5 0.3M**	**WS5 0.5M**	**WS6 0.3M**	**WS7 0.3M**	**WS9 0.3M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.3**	**0.5**	**0.3**	**0.3**	**0.3**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture	T277	AR	0.1	%	**17**	**19**	**21**	**19**	**17**
Moisture @ 105 C	T162	AR	0.1	%	**22**	**20**	**21**	**18**	**18**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 064**	**313199 066**	**313199 068**	**313199 070**	**313199 073**
				Customer Sample Reference	**WS12 0.2M**	**WS12 1.2M**	**WS13 0.60M**	**WS14 0.25M**	**HP1 0.1M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.2**	**1.2**	**0.60**	**0.25**	**0.1**
				Type	**Topsoil**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Moisture	T277	AR	0.1	%	**17**	**19**	**17**	**20**	**34**
Moisture @ 105 C	T162	AR	0.1	%	**17**	**26**	**17**	**20**	**33**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
MCERTS Preparation

				SAL Reference	**313199 075**	**313199 076**	**313199 077**	**313199 080**
				Customer Sample Reference	**HP1 0.65M**	**HP1 1.1M**	**HP2 0.2M**	**HP2 1.0M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.65**	**1.1**	**0.2**	**1.0**
				Type	**Clay**	**Clay**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
Moisture	T277	AR	0.1	%	**20**	**17**	**19**	**19**
Moisture @ 105 C	T162	AR	0.1	%	**22**	**19**	**20**	**20**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
% Stones

				SAL Reference	**313199 001**	**313199 002**	**313199 004**	**313199 007**	**313199 008**
				Customer Sample Reference	**TP1 0.1M**	**TP1 0.5M**	**TP2 0.05M**	**TP3 0.05M**	**TP3 0.60M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.5**	**0.05**	**0.05**	**0.60**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Retained on 2mm	T2	M40	0.1	%	**12.2**	**1.4**	**60.4**	**46.6**	**2.6**
Retained on 20mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 50mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
% Stones

				SAL Reference	**313199 010**	**313199 013**	**313199 015**	**313199 017**	**313199 018**
				Customer Sample Reference	**TP4 0.05M**	**TP5 0.20M**	**TP7 0.075M**	**TP8 0.15M**	**TP8 0.50M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.20**	**0.075**	**0.15**	**0.50**
				Type	**Sandy Soil**	**Clay**	**Fill**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Retained on 2mm	T2	M40	0.1	%	**18.3**	**0.8**	**67.5**	**60.6**	**1.0**
Retained on 20mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 50mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
% Stones

				SAL Reference	**313199 021**	**313199 022**	**313199 025**	**313199 028**	**313199 030**
				Customer Sample Reference	**TP9 0.05M**	**TP9 0.50M**	**TP10 0.075M**	**TP11 0.50M**	**TP12 0.10M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.50**	**0.075**	**0.50**	**0.10**
				Type	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Retained on 2mm	T2	M40	0.1	%	**16.1**	**3.7**	**6.5**	**6.6**	**78.9**
Retained on 20mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 50mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
% Stones

				SAL Reference	**313199 032**	**313199 035**	**313199 040**	**313199 045**	**313199 046**
				Customer Sample Reference	**WS1 0.35M**	**WS2 0.30M**	**WS3 0.80M**	**WS5 0.5M**	**WS6 0.3M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.35**	**0.30**	**0.80**	**0.5**	**0.3**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Retained on 2mm	T2	M40	0.1	%	**14.5**	**28.3**	**1.4**	**1.7**	**0.4**
Retained on 20mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 50mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
% Stones

				SAL Reference	**313199 049**	**313199 055**	**313199 064**	**313199 066**	**313199 068**
				Customer Sample Reference	**WS7 0.3M**	**WS9 0.3M**	**WS12 0.2M**	**WS12 1.2M**	**WS13 0.60M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.3**	**0.3**	**0.2**	**1.2**	**0.60**
				Type	**Clay**	**Topsoil**	**Topsoil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Retained on 2mm	T2	M40	0.1	%	**0.8**	**3.7**	**2.8**	**4.0**	**9.4**
Retained on 20mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1
Retained on 50mm	T2	M40	0.1	%	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
% Stones

				SAL Reference	**313199 070**	**313199 073**	**313199 077**
				Customer Sample Reference	**WS14 0.25M**	**HP1 0.1M**	**HP2 0.2M**
				Date Sampled	**15-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.25**	**0.1**	**0.2**
				Type	**Clay**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Retained on 2mm	T2	M40	0.1	%	**1.4**	**20.0**	**9.8**
Retained on 20mm	T2	M40	0.1	%	<0.1	<0.1	<0.1
Retained on 50mm	T2	M40	0.1	%	<0.1	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Heavy Metals(9)

				SAL Reference	**313199 001**	**313199 002**	**313199 004**	**313199 007**	**313199 008**
				Customer Sample Reference	**TP1 0.1M**	**TP1 0.5M**	**TP2 0.05M**	**TP3 0.05M**	**TP3 0.60M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.5**	**0.05**	**0.05**	**0.60**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**11**	**14**	**14**	**5**	**11**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**21**	**22**	**34**	**7**	**30**
Copper	T6	M40	1	mg/kg	**24**	**16**	**16**	**6**	**16**
Lead	T6	M40	1	mg/kg	**59**	**22**	**19**	**6**	**16**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**16**	**21**	**21**	**3**	**20**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	**89**	**69**	**61**	**29**	**60**

SAL Reference: 313199
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Soil Analysed as Soil
Heavy Metals(9)

				SAL Reference	**313199 010**	**313199 013**	**313199 015**	**313199 017**	**313199 018**
				Customer Sample Reference	**TP4 0.05M**	**TP5 0.20M**	**TP7 0.075M**	**TP8 0.15M**	**TP8 0.50M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.20**	**0.075**	**0.15**	**0.50**
				Type	**Sandy Soil**	**Clay**	**Fill**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**5**	**11**	**12**	**10**	**9**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**7**	**19**	**27**	**31**	**21**
Copper	T6	M40	1	mg/kg	**6**	**19**	**31**	**21**	**15**
Lead	T6	M40	1	mg/kg	**4**	**37**	**180**	**26**	**18**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**2**	**15**	**15**	**18**	**15**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	**16**	**63**	**840**	**79**	**52**

SAL Reference: 313199
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Soil Analysed as Soil
Heavy Metals(9)

				SAL Reference	**313199 021**	**313199 022**	**313199 025**	**313199 028**	**313199 030**
				Customer Sample Reference	**TP9 0.05M**	**TP9 0.50M**	**TP10 0.075M**	**TP11 0.50M**	**TP12 0.10M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.50**	**0.075**	**0.50**	**0.10**
				Type	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**5**	**9**	**4**	**10**	**11**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**9**	**19**	**5**	**25**	**22**
Copper	T6	M40	1	mg/kg	**6**	**18**	**4**	**15**	**14**
Lead	T6	M40	1	mg/kg	**5**	**53**	**4**	**32**	**28**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**3**	**14**	**2**	**19**	**16**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	**26**	**130**	**15**	**68**	**94**

SAL Reference: 313199
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Soil Analysed as Soil
Heavy Metals(9)

				SAL Reference	**313199 032**	**313199 035**	**313199 040**	**313199 045**	**313199 046**
				Customer Sample Reference	**WS1 0.35M**	**WS2 0.30M**	**WS3 0.80M**	**WS5 0.5M**	**WS6 0.3M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.35**	**0.30**	**0.80**	**0.5**	**0.3**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**11**	**9**	**14**	**8**	**9**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**25**	**14**	**30**	**20**	**22**
Copper	T6	M40	1	mg/kg	**19**	**16**	**17**	**14**	**15**
Lead	T6	M40	1	mg/kg	**200**	**64**	**17**	**15**	**23**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**18**	**9**	**24**	**15**	**16**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	**140**	**150**	**64**	**74**	**73**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Heavy Metals(9)

				SAL Reference	**313199 049**	**313199 055**	**313199 064**	**313199 066**	**313199 068**
				Customer Sample Reference	**WS7 0.3M**	**WS9 0.3M**	**WS12 0.2M**	**WS12 1.2M**	**WS13 0.60M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.3**	**0.3**	**0.2**	**1.2**	**0.60**
				Type	**Clay**	**Topsoil**	**Topsoil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Arsenic	T6	M40	2	mg/kg	**10**	**12**	**11**	**18**	**12**
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	**24**	**23**	**28**	**24**	**25**
Copper	T6	M40	1	mg/kg	**17**	**18**	**16**	**52**	**22**
Lead	T6	M40	1	mg/kg	**15**	**43**	**15**	**150**	**51**
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**17**	**18**	**23**	**22**	**19**
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	**69**	**75**	**61**	**180**	**79**

SAL Reference: 313199
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Soil Analysed as Soil
Heavy Metals(9)

				SAL Reference	**313199 070**	**313199 073**	**313199 077**
				Customer Sample Reference	**WS14 0.25M**	**HP1 0.1M**	**HP2 0.2M**
				Date Sampled	**15-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.25**	**0.1**	**0.2**
				Type	**Clay**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Arsenic	T6	M40	2	mg/kg	**11**	**10**	**7**
Cadmium	T6	M40	1	mg/kg	<1	<1	**2**
Chromium	T6	M40	1	mg/kg	**26**	**23**	**20**
Copper	T6	M40	1	mg/kg	**14**	**38**	**42**
Lead	T6	M40	1	mg/kg	**21**	**140**	**49**
Mercury	T6	M40	1	mg/kg	<1	<1	<1
Nickel	T6	M40	1	mg/kg	**19**	**19**	**21**
Selenium	T6	M40	3	mg/kg	<3	<3	<3
Zinc	T6	M40	1	mg/kg	**59**	**520**	**230**

SAL Reference: 313199
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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**313199 001**	**313199 002**	**313199 004**	**313199 007**	**313199 010**
				Customer Sample Reference	**TP1 0.1M**	**TP1 0.5M**	**TP2 0.05M**	**TP3 0.05M**	**TP4 0.05M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.5**	**0.05**	**0.05**	**0.05**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	-	N.D.	-	-
Total Organic Carbon	T21	M40	0.1	%	-	**0.7**	-	**1.6**	**0.3**

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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**313199 011**	**313199 015**	**313199 017**	**313199 022**	**313199 028**
				Customer Sample Reference	**TP4 0.50M**	**TP7 0.075M**	**TP8 0.15M**	**TP9 0.50M**	**TP11 0.50M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.50**	**0.075**	**0.15**	**0.50**	**0.50**
				Type		**Fill**	**Topsoil**	**Topsoil**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			-	N.D.	N.D.	N.D.	N.D.
Total Organic Carbon	T21	M40	0.1	%	**1.2**	-	**1.8**	-	**0.5**

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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**313199 030**	**313199 032**	**313199 035**	**313199 039**	**313199 047**
				Customer Sample Reference	**TP12 0.10M**	**WS1 0.35M**	**WS2 0.30M**	**WS3 0.40M**	**WS6 0.5M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.10**	**0.35**	**0.30**	**0.40**	**0.5**
				Type	**Topsoil**	**Clay**	**Clay**	**Clay**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			N.D.	N.D.	Chrysotile Detected **-**	-	-
Total Organic Carbon	T21	M40	0.1	%	-	**2.1**	-	**0.8**	**0.5**

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Soil Analysed as Soil
Miscellaneous

				SAL Reference	**313199 053**	**313199 067**	**313199 068**	**313199 070**	**313199 076**
				Customer Sample Reference	**WS8 0.9M**	**WS13 0.25M**	**WS13 0.60M**	**WS14 0.25M**	**HP1 1.1M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.9**	**0.25**	**0.60**	**0.25**	**1.1**
				Type			**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Asbestos ID	T27	AR			-	N.D.	-	-	N.D.
Total Organic Carbon	T21	M40	0.1	%	**0.2**	-	**1.7**	**1.1**	-

SAL Reference: 313199
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Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 001**	**313199 002**	**313199 004**	**313199 007**	**313199 008**
				Customer Sample Reference	**TP1 0.1M**	**TP1 0.5M**	**TP2 0.05M**	**TP3 0.05M**	**TP3 0.60M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.5**	**0.05**	**0.05**	**0.60**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
pH	T7	AR			**6.9**	**7.0**	**7.3**	**8.1**	**8.1**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	M40	0.01	%	**0.46**	**0.06**	**0.02**	**0.05**	**0.03**

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Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 010**	**313199 013**	**313199 015**	**313199 017**	**313199 018**
				Customer Sample Reference	**TP4 0.05M**	**TP5 0.20M**	**TP7 0.075M**	**TP8 0.15M**	**TP8 0.50M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.20**	**0.075**	**0.15**	**0.50**
				Type	**Sandy Soil**	**Clay**	**Fill**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
pH	T7	AR			**8.3**	**6.6**	**8.3**	**8.4**	**7.8**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
SO4(Total)	T6	M40	0.01	%	**0.02**	**0.10**	**0.16**	**0.08**	**0.05**

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Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 021**	**313199 022**	**313199 025**	**313199 028**	**313199 029**
				Customer Sample Reference	**TP9 0.05M**	**TP9 0.50M**	**TP10 0.075M**	**TP11 0.50M**	**TP11 1.10M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.50**	**0.075**	**0.50**	**1.10**
				Type	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	-
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	<1	-
pH	T7	AR			**7.9**	**7.8**	**7.7**	**8.2**	**7.9**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	<1	-
SO4(Total)	T6	M40	0.01	%	**0.03**	**0.16**	**0.01**	**0.03**	-

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 030**	**313199 032**	**313199 034**	**313199 035**	**313199 040**
				Customer Sample Reference	**TP12 0.10M**	**WS1 0.35M**	**WS1 1.30M**	**WS2 0.30M**	**WS3 0.80M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.10**	**0.35**	**1.30**	**0.30**	**0.80**
				Type	**Topsoil**	**Clay**		**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	-	<1	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	-	<1	<1
pH	T7	AR			**7.6**	**7.3**	**7.5**	**7.9**	**7.4**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	-	<1	<1
SO4(Total)	T6	M40	0.01	%	**0.07**	**0.10**	-	**0.10**	**270**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 045**	**313199 046**	**313199 049**	**313199 053**	**313199 055**
				Customer Sample Reference	**WS5 0.5M**	**WS6 0.3M**	**WS7 0.3M**	**WS8 0.9M**	**WS9 0.3M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.5**	**0.3**	**0.3**	**0.9**	**0.3**
				Type	**Clay**	**Clay**	**Clay**		**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	-	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	-	<1
pH	T7	AR			**7.2**	**6.9**	**6.4**	**7.2**	**7.3**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	-	<1
SO4(Total)	T6	M40	0.01	%	**0.03**	**0.06**	**0.03**	-	**0.13**

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 057**	**313199 060**	**313199 063**	**313199 064**	**313199 065**
				Customer Sample Reference	**WS9 1.2M**	**WS10 1.1M**	**WS11 1.1M**	**WS12 0.2M**	**WS12 0.6M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**1.2**	**1.1**	**1.1**	**0.2**	**0.6**
				Type				**Topsoil**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	-	-	-	<1	-
Cyanide(Total)	T546	AR	1	mg/kg	-	-	-	<1	-
pH	T7	AR			**7.2**	**6.9**	**7.9**	**8.0**	**7.6**
Phenols(Mono)	T546	AR	1	mg/kg	-	-	-	<1	-
SO4(Total)	T6	M40	0.01	%	-	-	-	**0.02**	-

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 066**	**313199 068**	**313199 070**	**313199 072**	**313199 073**
				Customer Sample Reference	**WS12 1.2M**	**WS13 0.60M**	**WS14 0.25M**	**WS14 1.1M**	**HP1 0.1M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**1.2**	**0.60**	**0.25**	**1.1**	**0.1**
				Type	**Clay**	**Clay**	**Clay**		**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	-	<1
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	<1	-	<1
pH	T7	AR			**7.7**	**6.7**	**5.8**	**7.0**	**6.5**
Phenols(Mono)	T546	AR	1	mg/kg	<1	<1	<1	-	<1
SO4(Total)	T6	M40	0.01	%	**0.09**	**0.05**	**0.06**	-	**0.17**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Soil Suite

				SAL Reference	**313199 076**	**313199 077**
				Customer Sample Reference	**HP1 1.1M**	**HP2 0.2M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**1.1**	**0.2**
				Type	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Boron (water-soluble)	T6	AR	1	mg/kg	-	**3**
Cyanide(Total)	T546	AR	1	mg/kg	-	<1
pH	T7	AR			**6.2**	**6.9**
Phenols(Mono)	T546	AR	1	mg/kg	-	<1
SO4(Total)	T6	M40	0.01	%	-	**0.04**

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Suite A

				SAL Reference	**313199 015**	**313199 029**	**313199 034**	**313199 053**	**313199 057**
				Customer Sample Reference	**TP7 0.075M**	**TP11 1.10M**	**WS1 1.30M**	**WS8 0.9M**	**WS9 1.2M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.075**	**1.10**	**1.30**	**0.9**	**1.2**
				Type	**Fill**				
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
pH	T7	AR			**8.3**	**7.9**	**7.5**	**7.2**	**7.2**
(Water Soluble) SO4 expressed as SO4	T242	AR	0.01	g/l	-	**0.01**	<0.01	**0.02**	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Suite A

				SAL Reference	**313199 060**	**313199 063**	**313199 065**	**313199 072**	**313199 076**
				Customer Sample Reference	**WS10 1.1M**	**WS11 1.1M**	**WS12 0.6M**	**WS14 1.1M**	**HP1 1.1M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**1.1**	**1.1**	**0.6**	**1.1**	**1.1**
				Type					**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
pH	T7	AR			**6.9**	**7.9**	**7.6**	**7.0**	**6.2**
(Water Soluble) SO4 expressed as SO4	T242	AR	0.01	g/l	<0.01	**0.01**	<0.01	**0.03**	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Total Petroleum Hydrocarbons CWG

				SAL Reference	**313199 035**	**313199 037**	**313199 039**	**313199 044**	**313199 073**
				Customer Sample Reference	**WS2 0.30M**	**WS2 1.50M**	**WS3 0.40M**	**WS5 0.3M**	**HP1 0.1M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.30**	**1.50**	**0.40**	**0.3**	**0.1**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Benzene	T209	M105	10	µg/kg	<10	<10	<10	<10	(110) <20
Toluene	T209	M105	10	µg/kg	<10	<10	<10	<10	**84**
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10	<10	**100**
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	**410**
O Xylene	T209	M105	10	µg/kg	<10	<10	<10	<10	**230**
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10	<10	(110) <20
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	(110) <0.200
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	**0.21**
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	**0.25**
TPH (C10-C12 aliphatic)	T206	M105	1	mg/kg	<1	<1	<1	<1	(9) <10
TPH (C12-C16 aliphatic)	T206	M105	2	mg/kg	**24**	<2	<2	<2	**17**
TPH (C16-C21 aliphatic)	T206	M105	1	mg/kg	**56**	<1	<1	<1	**86**
TPH (C21-C35 aliphatic)	T206	M105	4	mg/kg	**15**	<4	<4	<4	**12000**
TPH (C6-C7 aromatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	(110) <0.200
TPH (C7-C8 aromatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100	<0.100	(110) <0.200
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	**2.3**
TPH (C10-C12 aromatic)	T206	M105	1	mg/kg	<1	<1	<1	<1	(9) <10
TPH (C12-C16 aromatic)	T206	M105	1	mg/kg	<1	<1	<1	<1	(9) <10
TPH (C16-C21 aromatic)	T206	M105	1	mg/kg	**7**	<1	<1	<1	**97**
TPH (C21-C35 aromatic)	T206	M105	1	mg/kg	**15**	**2**	<1	**3**	**1400**

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Total Petroleum Hydrocarbons CWG

				SAL Reference	**313199 075**	**313199 076**	**313199 080**
				Customer Sample Reference	**HP1 0.65M**	**HP1 1.1M**	**HP2 1.0M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.65**	**1.1**	**1.0**
				Type	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**			
Benzene	T209	M105	10	µg/kg	<10	<10	<10
Toluene	T209	M105	10	µg/kg	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10
TPH (C10-C12 aliphatic)	T206	M105	1	mg/kg	<1	<1	<1
TPH (C12-C16 aliphatic)	T206	M105	2	mg/kg	<2	<2	<2
TPH (C16-C21 aliphatic)	T206	M105	1	mg/kg	**1**	<1	<1
TPH (C21-C35 aliphatic)	T206	M105	4	mg/kg	**51**	<4	**33**
TPH (C6-C7 aromatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100
TPH (C7-C8 aromatic)	T209	M105	0.100	mg/kg	<0.100	<0.100	<0.100
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	<0.10	<0.10	<0.10
TPH (C10-C12 aromatic)	T206	M105	1	mg/kg	<1	<1	<1
TPH (C12-C16 aromatic)	T206	M105	1	mg/kg	<1	<1	<1
TPH (C16-C21 aromatic)	T206	M105	1	mg/kg	<1	<1	<1
TPH (C21-C35 aromatic)	T206	M105	1	mg/kg	**5**	<1	**3**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 001**	**313199 002**	**313199 004**	**313199 007**	**313199 008**
				Customer Sample Reference	**TP1 0.1M**	**TP1 0.5M**	**TP2 0.05M**	**TP3 0.05M**	**TP3 0.60M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.5**	**0.05**	**0.05**	**0.60**
				Type	**Sandy Soil**	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	**0.9**	**0.2**	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	**0.7**	**0.2**	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	**0.5**	<0.1	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	**0.3**	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	**0.4**	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	**0.2**	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	**4.3**	**0.4**	<0.1	<0.1	<0.1

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 010**	**313199 013**	**313199 015**	**313199 017**	**313199 018**
				Customer Sample Reference	**TP4 0.05M**	**TP5 0.20M**	**TP7 0.075M**	**TP8 0.15M**	**TP8 0.50M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.20**	**0.075**	**0.15**	**0.50**
				Type	**Sandy Soil**	**Clay**	**Fill**	**Topsoil**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	**0.2**	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.2**	**0.2**	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	**0.1**	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	**0.4**	**0.6**	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 021**	**313199 022**	**313199 025**	**313199 028**	**313199 030**
				Customer Sample Reference	**TP9 0.05M**	**TP9 0.50M**	**TP10 0.075M**	**TP11 0.50M**	**TP12 0.10M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.05**	**0.50**	**0.075**	**0.50**	**0.10**
				Type	**Sandy Soil**	**Topsoil**	**Sandy Soil**	**Sandy Soil**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.3**	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.6**	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.5**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.1**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**1.9**	<0.1

ARUN DISTRICT COUNCIL LU/116/13/

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 032**	**313199 035**	**313199 040**	**313199 045**	**313199 046**
				Customer Sample Reference	**WS1 0.35M**	**WS2 0.30M**	**WS3 0.80M**	**WS5 0.5M**	**WS6 0.3M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.35**	**0.30**	**0.80**	**0.5**	**0.3**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.3**	<0.1	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.1**	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	**1.1**	<0.1	<0.1	<0.1

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 049**	**313199 055**	**313199 064**	**313199 066**	**313199 068**
				Customer Sample Reference	**WS7 0.3M**	**WS9 0.3M**	**WS12 0.2M**	**WS12 1.2M**	**WS13 0.60M**
				Date Sampled	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.3**	**0.3**	**0.2**	**1.2**	**0.60**
				Type	**Clay**	**Topsoil**	**Topsoil**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.5**	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.5**	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**0.1**	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	**1.9**	<0.1

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 070**	**313199 073**	**313199 075**	**313199 076**	**313199 077**
				Customer Sample Reference	**WS14 0.25M**	**HP1 0.1M**	**HP1 0.65M**	**HP1 1.1M**	**HP2 0.2M**
				Date Sampled	**15-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.25**	**0.1**	**0.65**	**1.1**	**0.2**
				Type	**Clay**	**Clay**	**Clay**	**Clay**	**Sandy Soil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Naphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	**0.3**
Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	<0.1	**0.6**
Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.9**	<0.1	<0.1	**0.5**
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.4**
Chrysene	T207	M105	0.1	mg/kg	<0.1	**0.3**	<0.1	<0.1	**0.5**
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.4**
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.4**
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.4**	<0.1	<0.1	**0.4**
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1	**0.2**	<0.1	<0.1	**0.2**
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1	**0.5**	<0.1	<0.1	**0.3**
PAH(total)	T207	M105	0.1	mg/kg	<0.1	**3.3**	<0.1	<0.1	**4.0**

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
PAH US EPA 16 (B and K split)

				SAL Reference	**313199 080**
				Customer Sample Reference	**HP2 1.0M**
				Date Sampled	**14-JAN-2013**
				Bottom Depth	**1.0**
				Type	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**	
Naphthalene	T207	M105	0.1	mg/kg	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1
Fluorene	T207	M105	0.1	mg/kg	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	<0.1
Anthracene	T207	M105	0.1	mg/kg	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	<0.1
Pyrene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	<0.1
Chrysene	T207	M105	0.1	mg/kg	<0.1
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	<0.1
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	<0.1
PAH(total)	T207	M105	0.1	mg/kg	<0.1

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Volatile Organic Compounds (USEPA 624) (MCERTS)

				SAL Reference	**313199 073**	**313199 075**	**313199 076**	**313199 080**
				Customer Sample Reference	**HP1 0.1M**	**HP1 0.65M**	**HP1 1.1M**	**HP2 1.0M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.1**	**0.65**	**1.1**	**1.0**
				Type	**Clay**	**Clay**	**Clay**	**Clay**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**				
1,1,1,2-Tetrachloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,1,1-Trichloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,1,2,2-Tetrachloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,1,2-Trichloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,1-Dichloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,1-Dichloroethylene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,1-Dichloropropene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,2,3-Trichloropropane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,2,4-Trimethylbenzene	T209	M105	50	µg/kg	**420**	<50	<50	<50
1,2-dibromoethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,2-Dichlorobenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,2-Dichloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,2-Dichloropropane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,3,5-Trimethylbenzene	T209	M105	50	µg/kg	**210**	<50	<50	<50
1,3-Dichlorobenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,3-Dichloropropane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
1,4-Dichlorobenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
2,2-Dichloropropane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
2-Chlorotoluene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
4-Chlorotoluene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Benzene	T209	M105	10	µg/kg	(110) <20	<10	<10	<10
Bromobenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Bromochloromethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Bromodichloromethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Bromoform	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Bromomethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Carbon tetrachloride	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Chlorobenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Chlorodibromomethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Chloroethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Chloroform	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Chloromethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Cis-1,2-Dichloroethylene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Cis-1,3-Dichloropropene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Dibromomethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Dichlorodifluoromethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Dichloromethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
EthylBenzene	T209	M105	10	µg/kg	**100**	<10	<10	<10
Isopropyl benzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
M/P Xylene	T209	M105	10	µg/kg	**410**	<10	<10	<10
n-Propylbenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
O Xylene	T209	M105	10	µg/kg	**230**	<10	<10	<10
p-Isopropyltoluene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
S-Butylbenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Styrene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
T-Butylbenzene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Tetrachloroethene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Toluene	T209	M105	10	µg/kg	**84**	<10	<10	<10
Trans-1,2-Dichloroethene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Trans-1,3-Dichloropropene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Trichloroethene	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Trichlorofluoromethane	T209	M105	50	µg/kg	(110) <100	<50	<50	<50
Vinyl chloride	T209	M105	50	µg/kg	(110) <100	<50	<50	<50

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Organochlorine insecticides

				SAL Reference	**313199 002**	**313199 007**	**313199 010**	**313199 013**	**313199 014**
				Customer Sample Reference	**TP1 0.5M**	**TP3 0.05M**	**TP4 0.05M**	**TP5 0.20M**	**TP6 0.25M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
				Bottom Depth	**0.5**	**0.05**	**0.05**	**0.20**	**0.25**
				Type	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Aldrin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Chlordane	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
DDD	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
DDE	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
DDT	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	T1	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorocyclohexane	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Organochlorine insecticides

				SAL Reference	**313199 021**	**313199 025**	**313199 041**	**313199 052**	**313199 055**
				Customer Sample Reference	**TP9 0.05M**	**TP10 0.075M**	**WS4 0.30M**	**WS8 0.4M**	**WS9 0.3M**
				Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
				Bottom Depth	**0.05**	**0.075**	**0.30**	**0.4**	**0.3**
				Type	**Sandy Soil**	**Sandy Soil**		**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**					
Aldrin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Chlordane	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
DDD	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
DDE	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
DDT	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	T1	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorocyclohexane	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Organochlorine insecticides

SAL Reference	**313199 058**	**313199 061**
Customer Sample Reference	**WS10 0.3M**	**WS11 0.3M**
Date Sampled	**15-JAN-2013**	**15-JAN-2013**
Bottom Depth	**0.3**	**0.3**
Type		

Determinand	Method	Test Sample	LOD	Units		
Aldrin	T16	AR	0.01	mg/kg	<0.01	<0.01
Chlordane	T16	AR	0.01	mg/kg	<0.01	<0.01
DDD	T16	AR	0.01	mg/kg	<0.01	<0.01
DDE	T16	AR	0.01	mg/kg	<0.01	<0.01
DDT	T16	AR	0.01	mg/kg	<0.01	<0.01
Dieldrin	T16	AR	0.01	mg/kg	<0.01	<0.01
Endosulphan	T16	AR	0.01	mg/kg	<0.01	<0.01
Endrin	T16	AR	0.01	mg/kg	<0.01	<0.01
Heptachlor	T16	AR	0.01	mg/kg	<0.01	<0.01
Heptachlor epoxide	T16	AR	0.01	mg/kg	<0.01	<0.01
Hexachlorobenzene	T1	AR	0.01	mg/kg	<0.01	<0.01
Hexachlorocyclohexane	T16	AR	0.01	mg/kg	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Organophosphorous insecticides

SAL Reference	**313199 002**	**313199 007**	**313199 010**	**313199 013**	**313199 014**
Customer Sample Reference	**TP1 0.5M**	**TP3 0.05M**	**TP4 0.05M**	**TP5 0.20M**	**TP6 0.25M**
Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
Bottom Depth	**0.5**	**0.05**	**0.05**	**0.20**	**0.25**
Type	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**	

Determinand	Method	Test Sample	LOD	Units					
Azinphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorvos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dimethoate	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Pirimiphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Organophosphorous insecticides

SAL Reference	**313199 021**	**313199 025**	**313199 041**	**313199 052**	**313199 055**
Customer Sample Reference	**TP9 0.05M**	**TP10 0.075M**	**WS4 0.30M**	**WS8 0.4M**	**WS9 0.3M**
Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
Bottom Depth	**0.05**	**0.075**	**0.30**	**0.4**	**0.3**
Type	**Sandy Soil**	**Sandy Soil**		**Clay**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units					
Azinphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorvos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dimethoate	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Pirimiphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Organophosphorous insecticides

					SAL Reference	**313199 058**	**313199 061**
					Customer Sample Reference	**WS10 0.3M**	**WS11 0.3M**
					Date Sampled	**15-JAN-2013**	**15-JAN-2013**
					Bottom Depth	**0.3**	**0.3**
					Type		
Determinand	**Method**	**Test Sample**	**LOD**	**Units**		
Azinphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01
Diazinon	T16	AR	0.01	mg/kg	<0.01	<0.01
Dichlorvos	T16	AR	0.01	mg/kg	<0.01	<0.01
Dimethoate	T16	AR	0.01	mg/kg	<0.01	<0.01
Fenitrothion	T16	AR	0.01	mg/kg	<0.01	<0.01
Malathion	T16	AR	0.01	mg/kg	<0.01	<0.01
Mevinphos	T16	AR	0.01	mg/kg	<0.01	<0.01
Parathion	T16	AR	0.01	mg/kg	<0.01	<0.01
Pirimiphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Phenoxy Acetic acid herbicides

					SAL Reference	**313199 002**	**313199 007**	**313199 010**	**313199 013**	**313199 014**
					Customer Sample Reference	**TP1 0.5M**	**TP3 0.05M**	**TP4 0.05M**	**TP5 0.20M**	**TP6 0.25M**
					Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
					Bottom Depth	**0.5**	**0.05**	**0.05**	**0.20**	**0.25**
					Type	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**	
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorprop	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fenoprop	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Mecoprop	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Phenoxy Acetic acid herbicides

					SAL Reference	**313199 021**	**313199 025**	**313199 041**	**313199 052**	**313199 055**
					Customer Sample Reference	**TP9 0.05M**	**TP10 0.075M**	**WS4 0.30M**	**WS8 0.4M**	**WS9 0.3M**
					Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
					Bottom Depth	**0.05**	**0.075**	**0.30**	**0.4**	**0.3**
					Type	**Sandy Soil**	**Sandy Soil**		**Clay**	**Topsoil**
Determinand	**Method**	**Test Sample**	**LOD**	**Units**						
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorprop	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fenoprop	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Mecoprop	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

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SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Phenoxy Acetic acid herbicides

SAL Reference	**313199 058**	**313199 061**
Customer Sample Reference	**WS10 0.3M**	**WS11 0.3M**
Date Sampled	**15-JAN-2013**	**15-JAN-2013**
Bottom Depth	**0.3**	**0.3**
Type		

Determinand	Method	Test Sample	LOD	Units		
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	<0.01	<0.01
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	<0.01	<0.01
Dichlorprop	T16	AR	0.01	mg/kg	<0.01	<0.01
Fenoprop	T16	AR	0.01	mg/kg	<0.01	<0.01
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	<0.01	<0.01
Mecoprop	T16	AR	0.01	mg/kg	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Triazines suite 2

SAL Reference	**313199 002**	**313199 007**	**313199 010**	**313199 013**	**313199 014**
Customer Sample Reference	**TP1 0.5M**	**TP3 0.05M**	**TP4 0.05M**	**TP5 0.20M**	**TP6 0.25M**
Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**
Bottom Depth	**0.5**	**0.05**	**0.05**	**0.20**	**0.25**
Type	**Clay**	**Sandy Soil**	**Sandy Soil**	**Clay**	

Determinand	Method	Test Sample	LOD	Units					
Atrazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Prometryn	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Propazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Terbutryn	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Trietazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Triazines suite 2

SAL Reference	**313199 021**	**313199 025**	**313199 041**	**313199 052**	**313199 055**
Customer Sample Reference	**TP9 0.05M**	**TP10 0.075M**	**WS4 0.30M**	**WS8 0.4M**	**WS9 0.3M**
Date Sampled	**14-JAN-2013**	**14-JAN-2013**	**14-JAN-2013**	**15-JAN-2013**	**15-JAN-2013**
Bottom Depth	**0.05**	**0.075**	**0.30**	**0.4**	**0.3**
Type	**Sandy Soil**	**Sandy Soil**		**Clay**	**Topsoil**

Determinand	Method	Test Sample	LOD	Units					
Atrazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Prometryn	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Propazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Terbutryn	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Trietazine	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 313199
Customer Reference: E-E1524

Soil Analysed as Soil
Triazines suite 2

SAL Reference	**313199 058**	**313199 061**
Customer Sample Reference	**WS10 0.3M**	**WS11 0.3M**
Date Sampled	**15-JAN-2013**	**15-JAN-2013**
Bottom Depth	**0.3**	**0.3**
Type		

Determinand	Method	Test Sample	LOD	Units		
Atrazine	T16	AR	0.01	mg/kg	<0.01	<0.01
Prometryn	T16	AR	0.01	mg/kg	<0.01	<0.01
Propazine	T16	AR	0.01	mg/kg	<0.01	<0.01
Simazine	T16	AR	0.01	mg/kg	<0.01	<0.01
Terbutryn	T16	AR	0.01	mg/kg	<0.01	<0.01
Trietazine	T16	AR	0.01	mg/kg	<0.01	<0.01

Index to symbols used in Supplement to 313199-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
9	LOD raised due to dilution of sample
110	LOD raised due to low internal standard recovery.
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

"Fill" samples are outside the scope of our MCERTS accreditation. Results are UKAS only
Supplemental report issued to correct the soluble sulphate for sample 63

Method Index

Value	Description
T2	Grav
T1	GC/MS (HR)
T207	GC/MS(MCERTS)
T206	GC/FID (MCERTS)
T21	OX/IR
T209	GC/MS(Head Space)(MCERTS)
T27	PLM
T162	Grav (1 Dec) (105 C)
T277	Grav (1 Dec) (40 C)
T6	ICP/OES
T16	GC/MS
T242	2:1 Extraction/ICP/OES (TRL 447 T1)
T546	Colorimetry (CF)
T7	Probe

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Benzene	T209	M105	10	µg/kg	M	035,037,039,044,073,075-076,080
Toluene	T209	M105	10	µg/kg	M	035,037,039,044,073,075-076,080
EthylBenzene	T209	M105	10	µg/kg	M	035,037,039,044,073,075-076,080
M/P Xylene	T209	M105	10	µg/kg	M	035,037,039,044,073,075-076,080

ARUN DISTRICT COUNCIL LU/116/13/

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
O Xylene	T209	M105	10	µg/kg	M	035,037,039,044,073,075-076,080
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	035,037,039,044,073,075-076,080
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	035,037,039,044,073,075-076,080
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	035,037,039,044,073,075-076,080
TPH (C8-C10 aliphatic)	T209	M105	0.10	mg/kg	N	035,037,039,044,073,075-076,080
TPH (C10-C12 aliphatic)	T206	M105	1	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C12-C16 aliphatic)	T206	M105	2	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C16-C21 aliphatic)	T206	M105	1	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C21-C35 aliphatic)	T206	M105	4	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C6-C7 aromatic)	T209	M105	0.100	mg/kg	N	035,037,039,044,073,075-076,080
TPH (C7-C8 aromatic)	T209	M105	0.100	mg/kg	N	035,037,039,044,073,075-076,080
TPH (C8-C10 aromatic)	T209	M105	0.10	mg/kg	N	035,037,039,044,073,075-076,080
TPH (C10-C12 aromatic)	T206	M105	1	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C12-C16 aromatic)	T206	M105	1	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C16-C21 aromatic)	T206	M105	1	mg/kg	M	035,037,039,044,073,075-076,080
TPH (C21-C35 aromatic)	T206	M105	1	mg/kg	M	035,037,039,044,073,075-076,080
(Water Soluble) SO4 expressed as SO4	T242	AR	0.01	g/l	N	029,034,053,057,060,063,065,072,076
Arsenic	T6	M40	2	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Arsenic	T6	M40	2.0	mg/kg	U	015
Cadmium	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Cadmium	T6	M40	1	mg/kg	U	015
Chromium	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Chromium	T6	M40	1	mg/kg	U	015
Copper	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Copper	T6	M40	1	mg/kg	U	015
Lead	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Lead	T6	M40	1	mg/kg	U	015
Mercury	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Mercury	T6	M40	1	mg/kg	U	015
Nickel	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Nickel	T6	M40	1	mg/kg	U	015
Selenium	T6	M40	3	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Selenium	T6	M40	3	mg/kg	U	015
Zinc	T6	M40	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Zinc	T6	M40	1	mg/kg	U	015
Retained on 2mm	T2	M40	0.1	%	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Retained on 20mm	T2	M40	0.1	%	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Retained on 50mm	T2	M40	0.1	%	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Azinphos methyl	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Diazinon	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Dichlorvos	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Dimethoate	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Fenitrothion	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Malathion	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Mevinphos	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Parathion	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Pirimiphos methyl	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Aldrin	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Chlordane	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
DDD	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
DDE	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
DDT	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Dieldrin	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Endosulphan	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Endrin	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Heptachlor	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Heptachlor epoxide	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Hexachlorobenzene	T1	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
Hexachlorocyclohexane	T16	AR	0.01	mg/kg	U	002,007,010,013-014,021,025,041,052,055,058,061
1,1,1,2-Tetrachloroethane	T209	M105	50	µg/kg	M	073,075-076,080
1,1,1-Trichloroethane	T209	M105	50	µg/kg	M	073,075-076,080
1,1,2,2-Tetrachloroethane	T209	M105	50	µg/kg	U	073,075-076,080

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
1,1,2-Trichloroethane	T209	M105	50	µg/kg	M	073,075-076,080
1,1-Dichloroethane	T209	M105	50	µg/kg	M	073,075-076,080
1,1-Dichloroethylene	T209	M105	50	µg/kg	M	073,075-076,080
1,1-Dichloropropene	T209	M105	50	µg/kg	M	073,075-076,080
1,2,3-Trichloropropane	T209	M105	50	µg/kg	U	073,075-076,080
1,2,4-Trimethylbenzene	T209	M105	50	µg/kg	M	073,075-076,080
1,2-dibromoethane	T209	M105	50	µg/kg	M	073,075-076,080
1,2-Dichlorobenzene	T209	M105	50	µg/kg	M	073,075-076,080
1,2-Dichloroethane	T209	M105	50	µg/kg	M	073,075-076,080
1,2-Dichloropropane	T209	M105	50	µg/kg	M	073,075-076,080
1,3,5-Trimethylbenzene	T209	M105	50	µg/kg	M	073,075-076,080
1,3-Dichlorobenzene	T209	M105	50	µg/kg	M	073,075-076,080
1,3-Dichloropropane	T209	M105	50	µg/kg	M	073,075-076,080
1,4-Dichlorobenzene	T209	M105	50	µg/kg	M	073,075-076,080
2,2-Dichloropropane	T209	M105	50	µg/kg	U	073,075-076,080
2-Chlorotoluene	T209	M105	50	µg/kg	U	073,075-076,080
4-Chlorotoluene	T209	M105	50	µg/kg	U	073,075-076,080
Bromobenzene	T209	M105	50	µg/kg	M	073,075-076,080
Bromochloromethane	T209	M105	50	µg/kg	M	073,075-076,080
Bromodichloromethane	T209	M105	50	µg/kg	M	073,075-076,080
Bromoform	T209	M105	50	µg/kg	M	073,075-076,080
Bromomethane	T209	M105	50	µg/kg	U	073,075-076,080
Carbon tetrachloride	T209	M105	50	µg/kg	M	073,075-076,080
Chlorobenzene	T209	M105	50	µg/kg	M	073,075-076,080
Chlorodibromomethane	T209	M105	50	µg/kg	M	073,075-076,080
Chloroethane	T209	M105	50	µg/kg	M	073,075-076,080
Chloroform	T209	M105	50	µg/kg	M	073,075-076,080
Chloromethane	T209	M105	50	µg/kg	U	073,075-076,080
Cis-1,2-Dichloroethylene	T209	M105	50	µg/kg	M	073,075-076,080
Cis-1,3-Dichloropropene	T209	M105	50	µg/kg	M	073,075-076,080
Dibromomethane	T209	M105	50	µg/kg	M	073,075-076,080
Dichlorodifluoromethane	T209	M105	50	µg/kg	M	073,075-076,080
Dichloromethane	T209	M105	50	µg/kg	U	073,075-076,080
Isopropyl benzene	T209	M105	50	µg/kg	M	073,075-076,080
n-Propylbenzene	T209	M105	50	µg/kg	M	073,075-076,080
p-Isopropyltoluene	T209	M105	50	µg/kg	M	073,075-076,080
S-Butylbenzene	T209	M105	50	µg/kg	M	073,075-076,080
Styrene	T209	M105	50	µg/kg	U	073,075-076,080
T-Butylbenzene	T209	M105	50	µg/kg	M	073,075-076,080
Tetrachloroethene	T209	M105	50	µg/kg	M	073,075-076,080
Trans-1,2-Dichloroethene	T209	M105	50	µg/kg	M	073,075-076,080
Trans-1,3-Dichloropropene	T209	M105	50	µg/kg	M	073,075-076,080
Trichloroethene	T209	M105	50	µg/kg	M	073,075-076,080
Trichlorofluoromethane	T209	M105	50	µg/kg	M	073,075-076,080
Vinyl chloride	T209	M105	50	µg/kg	M	073,075-076,080
Naphthalene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Naphthalene	T207	M105	0.1	mg/kg	U	015
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Acenaphthene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Acenaphthene	T207	M105	0.1	mg/kg	U	015
Fluorene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Fluorene	T207	M105	0.1	mg/kg	U	015
Phenanthrene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Phenanthrene	T207	M105	0.1	mg/kg	U	015
Anthracene	T207	M105	0.1	mg/kg	U	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Fluoranthene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Fluoranthene	T207	M105	0.1	mg/kg	U	015
Pyrene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Pyrene	T207	M105	0.1	mg/kg	U	015
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	U	015
Chrysene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Chrysene	T207	M105	0.1	mg/kg	U	015

ARUN DISTRICT COUNCIL LU/116/13/

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Benzo(b)fluoranthene	T207	M105	0.1	mg/kg	U	015
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Benzo(k)fluoranthene	T207	M105	0.1	mg/kg	U	015
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	U	015
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	U	015
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	U	015
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	U	015
PAH(total)	T207	M105	0.1	mg/kg	U	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,075-077,080
Atrazine	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Prometryn	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Propazine	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Simazine	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Terbutryn	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Trietazine	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Boron (water-soluble)	T6	AR	1	mg/kg	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Cyanide(Total)	T546	AR	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Cyanide(Total)	T546	AR	1	mg/kg	U	015
pH	T7	AR			M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
pH	T7	AR			U	015,029,034,053,057,060,063,065,072,076
Phenols(Mono)	T546	AR	1	mg/kg	M	001-002,004,007-008,010,013,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Phenols(Mono)	T546	AR	1	mg/kg	U	015
SO4(Total)	T6	M40	0.01	%	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,040,045-046,049,055,064,066,068,070,073,077
Phenoxy Acetic acid herbicide: 2,4,5-T	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Phenoxy Acetic acid herbicide: 2,4-D	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Dichlorprop	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Fenoprop	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Phenoxy Acetic acid herbicide: MCPA	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Mecoprop	T16	AR	0.01	mg/kg	N	002,007,010,013-014,021,025,041,052,055,058,061
Asbestos ID	T27	AR			SU	001,004,015,017,022,028,030,032,035,067,076
Total Organic Carbon	T21	M40	0.1	%	N	002,007,010-011,017,028,032,039,047,053,068,070
Moisture	T277	AR	0.1	%	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,037,039-040,044-046,049,055,064,066,068,070,073,075-077,080
Moisture @ 105 C	T162	AR	0.1	%	N	001-002,004,007-008,010,013,015,017-018,021-022,025,028,030,032,035,037,039-040,044-046,049,055,064,066,068,070,073,075-077,080

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground (Sand)
Contaminant(s): Metals, metalloids
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	
Critical concentration, C_c	**32**	**10**	**38**	**8340**	**450**	**170**	**130**	**350**	**38000**	
Notes										
Sample size, n	4	4	4	4	4	4	4	4	4	0
Sample mean, $\overline{x}$	6.5	0.5	12	11.75	48.75	0.5	5.75	1.5	227.5	No Data
Standard deviation, s	3.6968455	0	10.1324561	12.8679188	87.5038094	0	6.18465844	0	408.377685	
Number of non-detects	0	**4**	0	0	0	**4**	0	**4**	0	
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	
Distribution	Non-normal	Single value	Normal	Non-normal	Non-normal	Single value	Non-normal	Single value	Non-normal	
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers		
t statistic, t_0 (or k_0)	-13.79554541	N/A	-5.132023221	-1294.420668	-9.171029297	N/A	-40.18006855	N/A	-184.9880707	
Upper confidence limit (on true mean concentration, μ)	14.557088	0.5	23.9226758	39.7949788	239.460131	0.5	19.2291506	1.5	1117.53853	
Evidence level	**99%**	**100%**	**99%**	**100%**	**99%**	**100%**	**100%**	**100%**	**100%**	
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground (Sand)
Contaminant(s): Metals, metalloids
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

Critical concentration, C_c							
Notes							
Sample size, n	0	0	0	0	0	0	0
Sample mean, $\overline{x}$	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Standard deviation, s							
Number of non-detects							
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?							
Distribution							
Statistical approach	Auto	Auto	Auto	Auto	Auto	Auto	Auto

Test scenario:							
t statistic, t_0 (or k_0)							
Upper confidence limit (on true mean concentration, μ)							
Evidence level							
Base decision on:							
Result							
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

Back to data

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground (Sand)
Contaminant(s): PAHs
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

	Naphthalene	Acenaphthene	Fluorene	Anthracene	Fluoranthene	Pyrene	Benzo(a)Anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Critical concentration, C_c	**4.4**	**9.2**	**2340**	**5860**	**1630**	**1150**	**7.2**	**840**	**9.4**	**97**
Notes										
Sample size, n	4	4	4	4	4	4	4	4	4	4
Sample mean, $\overline{x}$	0.05	0.05	0.05	0.05	0.0875	0.0875	0.0625	0.05	0.05	0.0625
Standard deviation, s	0	0	0	0	0.075	0.075	0.025	0	0	0.025
Number of non-detects	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**4**	**4**	**3**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	No	No	No	Yes	Yes	Yes	No	No	Yes
Distribution	Single value	Single value	Single value	Single value	Non-normal	Non-normal	Non-normal	Single value	Single value	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		95%	Use Normal distribution to test for outliers		
t statistic, t_0 (or k_0)	N/A	N/A	N/A	N/A	-43464.33333	-30664.33333	-571	N/A	N/A	-7755
Upper confidence limit (on true mean concentration, μ)	0.05	0.05	0.05	0.05	0.25095871	0.25095871	0.11698624	0.05	0.05	0.11698624
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground (Sand)
Contaminant(s): PAHs
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

	Benzo(a)Pyrene	Indeno(123-cd)Pyrene	Dibenzo(ah)Anthracene				
Critical concentration, C_c	**0.96**	**9.2**	**0.97**				
Notes							
Sample size, n	4	4	4	0	0	0	0
Sample mean, $\overline{x}$	0.05	0.05	0.05	No Data	No Data	No Data	No Data
Standard deviation, s	0	0	0				
Number of non-detects	**4**	**4**	**4**				
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	No	No				
Distribution	Single value	Single value	Single value				
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto	Auto	Auto	Auto

Test scenario:							
t statistic, t_0 (or k_0)	N/A	N/A	N/A				
Upper confidence limit (on true mean concentration, μ)	0.05	0.05	0.05				
Evidence level	**100%**	**100%**	**100%**				
Base decision on:	evidence level	evidence level	evidence level				
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**				
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

Back to data

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground
Contaminant(s): Metals, metalloids
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	
Critical concentration, C_c	**32**	**10**	**38**	**8340**	**450**	**170**	**130**	**350**	**38000**	
Notes										
Sample size, n	13	13	13	13	13	13	13	13	13	0
Sample mean, $\overline{x}$	9.92307692	0.61538462	22.4615385	18.7692308	47.5384615	0.5	16.2307692	1.5	96.0769231	No Data
Standard deviation, s	2.25320285	0.41602515	7.00732218	8.26794862	49.5136604	0	5.5850074	0	54.8975736	
Number of non-detects	0	**12**	0	0	0	**13**	0	**13**	0	
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	Yes	No	Yes	Yes	No	No	No	Yes	
Distribution	Normal	Non-normal	Normal	Non-normal	Non-normal	Single value	Normal	Single value	Normal	
Statistical approach	Auto: One-sample t-	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: One-sample t-	Auto

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		95%	Use Normal distribution to test for outliers		
t statistic, t_0 (or k_0)	-35.32725791	-81.33333333	-7.995168254	-3628.78697	-29.30697715	N/A	-73.44677733	N/A	-2489.445875	
Upper confidence limit (on true mean concentration, μ)	11.0368748	1.11833449	25.9253813	28.7646933	107.397558	0.5	18.9915368	1.5	123.213761	
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground
Contaminant(s): Metals, metalloids
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

Critical concentration, C_c							
Notes							
Sample size, n	0	0	0	0	0	0	0
Sample mean, $\overline{x}$	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Standard deviation, s							
Number of non-detects							
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?							
Distribution							
Statistical approach	Auto	Auto	Auto	Auto	Auto	Auto	Auto

Test scenario:							
t statistic, t_0 (or k_0)							
Upper confidence limit (on true mean concentration, μ)							
Evidence level							
Base decision on:							
Result							
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

Back to data

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground
Contaminant(s): PAHs
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

	Naphthalene	Acenaphthene	Fluorene	Anthracene	Fluoranthene	Pyrene	Benzo(a)Anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Critical concentration, C_c	**4.4**	**9.2**	**2340**	**5860**	**1630**	**1150**	**7.2**	**840**	**9.4**	**97**
Notes										
Sample size, n	13	13	13	13	13	13	13	13	13	13
Sample mean, $\overline{x}$	0.05	0.05	0.05	0.05	0.21153846	0.18846154	0.12307692	0.13461538	0.10769231	0.1
Standard deviation, s	0	0	0	0	0.29022538	0.23107885	0.15222706	0.15191091	0.13045777	0.11365151
Number of non-detects	**13**	**13**	**13**	**13**	**9**	**9**	**10**	**9**	**10**	**10**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	No	No	No	Yes	No	Yes	Yes	No	Yes
Distribution	Single value	Single value	Single value	Single value	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		95%	Use Normal distribution to test for outliers		
t statistic, t_0 (or k_0)	N/A	N/A	N/A	N/A	-20247.31929	-17940.64849	-167.6194069	-19933.90604	-256.8179025	-3074.115829
Upper confidence limit (on true mean concentration, μ)	0.05	0.05	0.05	0.05	0.56240383	0.46782225	0.30711046	0.31826671	0.26540807	0.23739798
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Made Ground
Contaminant(s): PAHs
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants (UK) Ltd

	Benzo(a)Pyrene	Indeno(123-cd)Pyrene	Dibenzo(ah)Anthracene				
Critical concentration, C_c	**0.96**	**9.2**	**0.97**				
Notes							
Sample size, n	13	13	13	0	0	0	0
Sample mean, $\overline{x}$	0.10384615	0.07692308	0.05	No Data	No Data	No Data	No Data
Standard deviation, s	0.13143683	0.05633007	0				
Number of non-detects	**11**	**10**	**13**				
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	No	No				
Distribution	Non-normal	Non-normal	Single value				
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto	Auto	Auto	Auto

Test scenario:							
t statistic, t_0 (or k_0)	-23.48585648	-583.9460332	N/A				
Upper confidence limit (on true mean concentration, μ)	0.26274554	0.14502281	0.05				
Evidence level	**100%**	**100%**	**100%**				
Base decision on:	evidence level	evidence level	evidence level				
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**				
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

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ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Natural Ground: River Terrace Deposits
Contaminant(s): Metals, metalloids
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants

	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Zinc	
Critical concentration, C_c	**32**	**10**	**38**	**8340**	**450**	**170**	**130**	**350**	**38000**	
Notes										
Sample size, n	11	11	11	11	11	11	11	11	11	0
Sample mean, $\overline{x}$	11.6363636	0.5	23.9090909	21.4545455	45.3636364	0.5	18.7272727	1.5	118.727273	No Data
Standard deviation, s	2.8025962	0	3.56243022	12.1520668	50.1303755	0	2.90141032	0	137.419133	
Number of non-detects	0	**11**	0	0	0	**11**	0	**11**	0	
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	Yes	No	No	Yes	No	No	No	No	Yes	
Distribution	Normal	Single value	Normal	Non-normal	Non-normal	Single value	Normal	Single value	Non-normal	
Statistical approach	Auto: One-sample t-	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: One-sample t-	Auto: Chebychev	Auto: Chebychev	Auto

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		95%	Use Normal distribution to test for outliers		
t statistic, t_0 (or k_0)	-24.09856304	N/A	-13.11864528	-2270.354052	-26.77073495	N/A	-127.1967235	N/A	-914.2683792	
Upper confidence limit (on true mean concentration, μ)	13.1679197	0.5	25.8558792	37.4254901	111.247857	0.5	20.3128284	1.5	299.331397	
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Natural Ground: River Terrace Deposits
Contaminant(s): Metals, metalloids
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants

Critical concentration, C_c							
Notes							
Sample size, n	0	0	0	0	0	0	0
Sample mean, $\overline{x}$	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Standard deviation, s							
Number of non-detects							
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?							
Distribution							
Statistical approach	Auto	Auto	Auto	Auto	Auto	Auto	Auto

Test scenario:							
t statistic, t_0 (or k_0)							
Upper confidence limit (on true mean concentration, μ)							
Evidence level							
Base decision on:							
Result							
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

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ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Natural Ground: River Terrace Deposits
Contaminant(s): PAHs
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants

	Naphthalene	Acenaphthene	Fluorene	Anthracene	Fluoranthene	Pyrene	Benzo(a)Anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene
Critical concentration, C_c	**4.4**	**9.2**	**2340**	**5860**	**1630**	**1150**	**7.2**	**840**	**9.4**	**97**
Notes										
Sample size, n	14	14	14	14	14	14	14	14	14	14
Sample mean, $\overline{x}$	0.05	0.05	0.05	0.05	0.12857143	0.16428571	0.07142857	0.07857143	0.07142857	0.06071429
Standard deviation, s	0	0	0	0	0.14769288	0.24606798	0.05447048	0.07522859	0.05447048	0.04008919
Number of non-detects	**14**	**14**	**14**	**14**	**10**	**10**	**12**	**12**	**12**	**13**
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	No	No	No	No	Yes	Yes	No	Yes	No	Yes
Distribution	Single value	Single value	Single value	Single value	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal	Non-normal
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev

Test scenario:	Planning: is true mean lower than critical concentration (μ < Cc)?				**Evidence level required:**		**95%**	Use Normal distribution to test for outliers		
t statistic, t_0 (or k_0)	N/A	N/A	N/A	N/A	-41291.22859	-17484.15744	-489.6720747	-41775.31765	-640.7933162	-9047.666667
Upper confidence limit (on true mean concentration, μ)	0.05	0.05	0.05	0.05	0.30062843	0.45094624	0.13488476	0.16621008	0.13488476	0.10741677
Evidence level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Base decision on:	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level	evidence level
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**	**μ < Cc**
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	◉ Y	○ Y	○ Y	○ Y

Back to data | **Go to outlier test** | **Go to normality test** | **Show individual summary**

ARUN DISTRICT COUNCIL LU/116/13/

Client/client ref: Wilmington Homes Ltd
Project ref: E-E1524.00
Site ref: Hollyacre
Data description: Natural Ground: River Terrace Deposits
Contaminant(s): PAHs
Test scenario: Planning
Date: 8th February 2013
User details: Opus International Consultants

	Benzo(a)Pyrene	Indeno(123-cd)Pyrene	Dibenzo(ah)Anthracene				
Critical concentration, C_c	**0.96**	**9.2**	**0.97**				
Notes							
Sample size, n	14	14	14	0	0	0	0
Sample mean, $\overline{x}$	0.07857143	0.06071429	0.05	No Data	No Data	No Data	No Data
Standard deviation, s	0.09346798	0.04008919	0				
Number of non-detects	**12**	**13**	**14**				
Set non-detect values to:	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit	Half detection limit
Outliers?	Yes	Yes	No				
Distribution	Non-normal	Non-normal	Single value				
Statistical approach	Auto: Chebychev	Auto: Chebychev	Auto: Chebychev	Auto	Auto	Auto	Auto

Test scenario:							
t statistic, t_0 (or k_0)	-35.28484985	-853	N/A				
Upper confidence limit (on true mean concentration, μ)	0.18745833	0.10741677	0.05				
Evidence level	**100%**	**100%**	**100%**				
Base decision on:	evidence level	evidence level	evidence level				
Result	**μ < Cc**	**μ < Cc**	**μ < Cc**				
Select dataset	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y	○ Y

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In House Screening Values – V2009.2 - REV A 25th August 2009

RESIDENTIAL WITH HOMEGROWN PRODUCE

Determinand	Screening Value (mg/kg)				Reference
INORGANICS					
Arsenic		**32**			SC050021 / Arsenic SGV
Cadmium		**10**			SC050021 / Cadmium SGV
Chromium		38			CLEA 1.04
Lead		450			SEGH
Inorganic Mercury (1)		**170**			SC050021 / Mercury SGV
Nickel		**130**			SC050021 / Nickel SGV
Selenium		**350**			SC050021 / Selenium SGV
Free Cyanide		50			CLR
Copper (2)		8,340			CLEA 1.04
Boron (2)		59			CLEA 1.04
Zinc (2)		38,000			CLEA 1.04
Tin (2)		4,360			CLEA 1.04
ORGANICS					
SOM	**0.25%**	**1%**	**3%**	**6% (SGV Default)**	
Benzene (3)	0.035	0.079	0.18	**0.33**	CLEA 1.04 ; Benzene SGV
Toluene (3)	41	120	320	**610**	CLEA 1.04 ; Toluene SGV
Ethylbenzene (3)	20	65	180	**350**	CLEA 1.04 ; Ethylbenzene SGV
m-Xylene (3,4)	14	44	120	**240**	CLEA 1.04 ; Xylenes SGV
o-Xylene (3,4)	14	45	130	**250**	CLEA 1.04 ; Xylenes SGV
p-Xylene (3,4)	13	42	120	**230**	CLEA 1.04 ; Xylenes SGV
Phenol	100	190	320	**420**	CLEA 1.04 : Phenol SGV
1,2 Dichloroethane	0.0035	0.0053	0.0088	0.014	CLEA 1.04
1,1,1 Trichloroethane	2.9	6.2	15	28	CLEA 1.04
Tetrachloroethane	0.57	1.4	3.4	6.3	CLEA 1.04
Tetrachlorethene	0.44	1.2	3.2	6.2	CLEA 1.04
Trichloroethene	0.048	0.11	0.26	0.49	CLEA 1.04
Vinyl Chloride	0.00034	0.00047	0.00069	0.00099	CLEA 1.04
PAH					
Naphthalene	0.46	1.5	4.4	8.7	CLEA 1.04
Acenapthene	0.81*	3.1*	9.2*	18*	CLEA 1.04
Fluorene	590	1,520	2,340	2,700	CLEA 1.04
Anthracene	640	2,340	5,860	9,420	CLEA 1.04
Fluoranthene	260	8,230	1,630	2,160	CLEA 1.04
Pyrene	170	560	1,150	1,560	CLEA 1.04
Benzo(a)anthacene	1.7	4.5	7.2	8.5	CLEA 1.04
Chrysene	270	600	840	930	CLEA 1.04
Benzo(b)fluoranthene	4.5	7.8	9.4	9.9	CLEA 1.04
Benzo(k)fluoranthene	55	85	97	100	CLEA 1.04
Benzo(a)pyrene	0.51	0.83	0.96	1.0	CLEA 1.04
Indeno(123cd)pyrene	4.0	7.4	9.2	9.7	CLEA 1.04
Dibenzo(ah)anthracene	0.54	0.85	0.97	1.0	CLEA 1.04
Banded TPH					
Aliphatic C5-6	36	62	130	233	CLEA 1.04
Aliphatic >C6-8	57 *	150 *	400 *	774 *	CLEA 1.04
Aliphatic >C8-10	11	39	111	219	CLEA 1.04
Aliphatic >C10-12	13 *	50 *	149 *	298 *	CLEA 1.04
Aliphatic >C12-16	5.5 *	22 *	66 *	133 *	CLEA 1.04
Aliphatic >C16-21	177,000	177,000	177,000	177,000	CLEA 1.04
Aliphatic >C35 - 44	177,000	177,000	177,000	177,000	CLEA 1.04
Aromatic C5-7	0.035	0.079	0.18	**0.33**	CLEA 1.04 – Benzene SGV
Aromatic >C7-8	41	120	320	**610**	CLEA 1.04 – Toluene SGV
Aromatic >C8-10	10	37	109	214	CLEA 1.04
Aromatic >C10-12	22	83	234	431	CLEA 1.04
Aromatic >C12-16	53	197	513	858	CLEA 1.04
Aromatic >C16-21	161	541	1,150	1,600	CLEA 1.04
Aromatic >C21-35	893	1,770	2,270	2,450	CLEA 1.04
Aromatic >C35 – 44	895	1,780	2,280	2,450	CLEA 1.04
Aliphatic & Aromatic > C44	1,780	2,360	2,550	2,600	CLEA 1.04

NOTES

(1) The value quoted is for inorganic mercury which the 2009 SGV indicates will be the most relevant in near surface soils. Consideration will need to be given to the requirement to look at elemental and methyl mercury values separately should these be considered to be present on the site.

(2) Values are set at residential with homegrown produce for all uses. Values may be higher for other land uses. Additionally there may be a requirement to consider the effects on plant growth based on the British Standard for topsoil (BS3882:2007). It should be noted that some compounds may be pH sensitive.

(3) This value has been benchmarked against the SGV at 6% SOM.

(4) Where xylene result is not split into isomers compare the total xylene concentration to the lowest xylene isomer as an initial screen.

Identifications of concentrations within soil above the appropriate SGV or Tier 1 IHSL values should be considered with further Tier 2 risk assessment since inclusion of hydrocarbon resistant membranes etc might allow higher acceptable concentrations of volatile hydrocarbons. It is recommended that the methodology of this assessment is agreed with the Regulatory Authorities.

With regards to the elevated organic compounds (notably the heavier TPH fractions), consideration will have to be given to aesthetic values at the concentrations detailed above which in themselves are not considered harmful to human health.

No account has been taken of the additive or synergistic effects of the compounds since guidance is being finalised in this regard.

Values in **bold** are published SGVs (at 6% SOM).

* Assessment criteria exceed lower saturation limit and vapour pathway is important contributor to exposure. IHSV is limited to soil saturation limit.

ARUN DISTRICT COUNCIL LU/116/13/

Methodology for the Screening of Soils in Terms of the Risk to Human Health (Including the Opus Methodology for Calculating Tier 1 Soil Screening Values)

The legislative framework for the regulation of contaminated land is contained in Part 2A of the Environmental Protection Act 1990, which was implemented in the Contaminated Land (England) Regulations 2000 (and subsequent amendments). This legislation allows for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment. The basis of the UK contaminated land policy is the 'Suitable for Use' approach, which states that land should be suitable for its current use and made suitable for any new use as official permission (through the planning process) is given for that use.

Under Part 2A of the Environmental Protection Act 1990, contaminated land is defined as land where 'significant harm' is being caused or there is a 'significant possibility of such harm' being caused or where 'significant pollution of controlled waters' is being caused, or there is a 'significant possibility of such pollution' being caused. For contaminated land to occur under Part 2A a contaminant linkage must exist i.e. there must be a contaminant, a relevant receptor and a plausible migration pathway by which the contaminant can impact the receptor.

In April 2012, the Part 2A Statutory Guidance was revised and this has introduced four categories of land with respect to human health. Statutory contaminated land comprises Category 1 (where significant harm is being caused) and Category 2 (where significant possibility of such harm (SPOSH) is being caused). Category 3 is land not capable of being determined as SPOSH and Category 4 is uncontaminated.

Also in April 2012 the new National Planning Policy Framework was introduced in England. Under the NPPF, land should be suitable for its new use taking the effects of ground contamination into consideration. To this end adequate site investigation should be undertaken and this should be prepared by competent persons, such as Opus. After remediation, as a minimum, land should be incapable of being determined Part 2A contaminated land. Where a site is affected by contamination, responsibility for securing safe development rests with the developer and/or landowner.

The DEFRA impact assessment report accompanying the revised Part 2A Statutory Guidance indicates that most developers will want to ensure their land is safely within Category 4 and this is the approach adopted by Opus in the preparation of this report. To assist with the implementation of Part 2A and contamination assessments under the planning process, DEFRA is commissioning a research project to derive new Category 4 Screening Levels (C4SLs). DEFRA envisage that the new C4SLs will replace the current Soil Guidelines Values (SGVs), which are considered indicative of minimal risk. It is proposed by DEFRA that the new C4SLs will be higher than the current SGVs. Until such a time as the new C4SLs are introduced Opus has continued to use the SGVs and other similarly derived generic assessment criteria.

The current SGVs published by the Environment Agency were derived using version 1.06 of the CLEA model. Where no SGVs exist for certain contaminants Opus has derived Tier 1 soil screening values (SSVs) and is currently utilising Version 2009.2 – Rev A, dated 25th August 2009. These Tier 1 SSVs are compliant with the Environment Agency recommended approach as set out in CLEA version 1.06.

The methodology employed to calculate these values is as follows:

Where available (arsenic, cadmium, BTEX, mercury, nickel, phenol and selenium) the SGV value at a suitable soil organic matter (SOM) content will be utilised. For compounds where no SGV has been published, Opus has derived Tier 1 SSVs utilising United Kingdom based toxicological data where available. However, where a TOX report is not available, reference has again been made to the Risk Assessment Information System (RAIS) database and other relevant toxicological database publication for toxicological information.

In relation to the petroleum hydrocarbon fractions, Opus has followed the procedures presented within the Mole Valley District Council position paper (Human Health Generic Assessment Criteria for Petroleum Hydrocarbons, dated May 2009). This document follows the procedures set out in the Environment Agency publications SC050021/SR7 and P5-080/TR3 (The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils). Additionally the Tier 1 screening values do not consider the additive or synergistic effects of any compounds.

The default parameters are accepted when running the model at a Tier 1 level to give the most conservative model except that the SOM is calculated with a range from 0.25% to 6% to be in line with current SGVs where a SOM of 6% has been adopted but also to look at natural soils which may have a lower SOM.

With regards to plant uptake, the guidance offered by the Environment Agency within their publication SC50021/SR3 has been adopted with relevant soil parameters being adjusted to 10^{o}C where possible.

Lead cannot be modelled within the CLEA v1.06 software as the toxicological data is based on blood lead level rather than an Index Dose or Tolerable Daily Intake. Consequently the lead value quoted has been determined using the initial algorithms within the SEGH 1993 model (Lead in soil: recommended guidelines, Wixson BG & Davies BE eds. Society for Environmental Geochemistry and Health, Science reviews).

APPENDIX D

Geotechnical Test Results

ARUN DISTRICT COUNCIL LU/116/13/

Project Name:	Hollyacre, Toddington Lane			**Samples Received:**	25/01/2013
				Project Started:	28/01/2013
Client:	Opus International Consultants (UK) Ltd			**Testing Started:**	05/02/2013
Project No:	E-E1524	**Our job/report no:**	13990	**Date Reported:**	07/02/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
TP1	B	0.50	Brown slightly fine sandy silty CLAY with rare fine gravel	24	39	24	15	98	
TP5	B	0.70	Dark greenish grey slightly sandy silty CLAY with rare fine gravel	27	35	19	16	98	
TP6	B	0.70	Brown sandy silty CLAY	24	39	20	19	100	
TP11	B	1.10	Brown slightly gravelly silty sandy CLAY (gravel is fmc and sub-angular to sub-rounded)	23	38	19	19	90	
TP12	B	0.80	Brown sandy silty CLAY with occasional fine rootlets	23	38	20	18	100	
WS1	D	0.70	Pale brown silty CLAY with a little fine gravel	19	34	18	16	95	
WS1	D	1.90	Brown and pale grey silty CLAY with a little fmc gravel	23	35	16	19	85	
WS5	D	0.75	Brown slightly sandy silty CLAY	25	30	20	10	100	
WS5	D	2.50	Orange-brown sandy silty CLAY	18	27	16	11	100	
WS7	D	1.00	Brown sandy silty CLAY	24	38	20	18	100	
WS7	D	2.10	Orange -brown slightly sandy silty CLAY with a little fm gravel	16	32	15	17	98	
WS9	D	1.20	Brown sandy silty CLAY with a little fm gravel	22	35	18	17	95	
WS9	D	2.10	Brown sandy silty CLAY with a little fm gravel	18	31	16	15	99	
WS13	D	0.85	Brown slightly sandy silty CLAY with a little fine gravel	24	37	19	18	99	
WS13	D	1.70	Brown sandy CLAY with a little fm gravel	16	26	14	12	97	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 07/02/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

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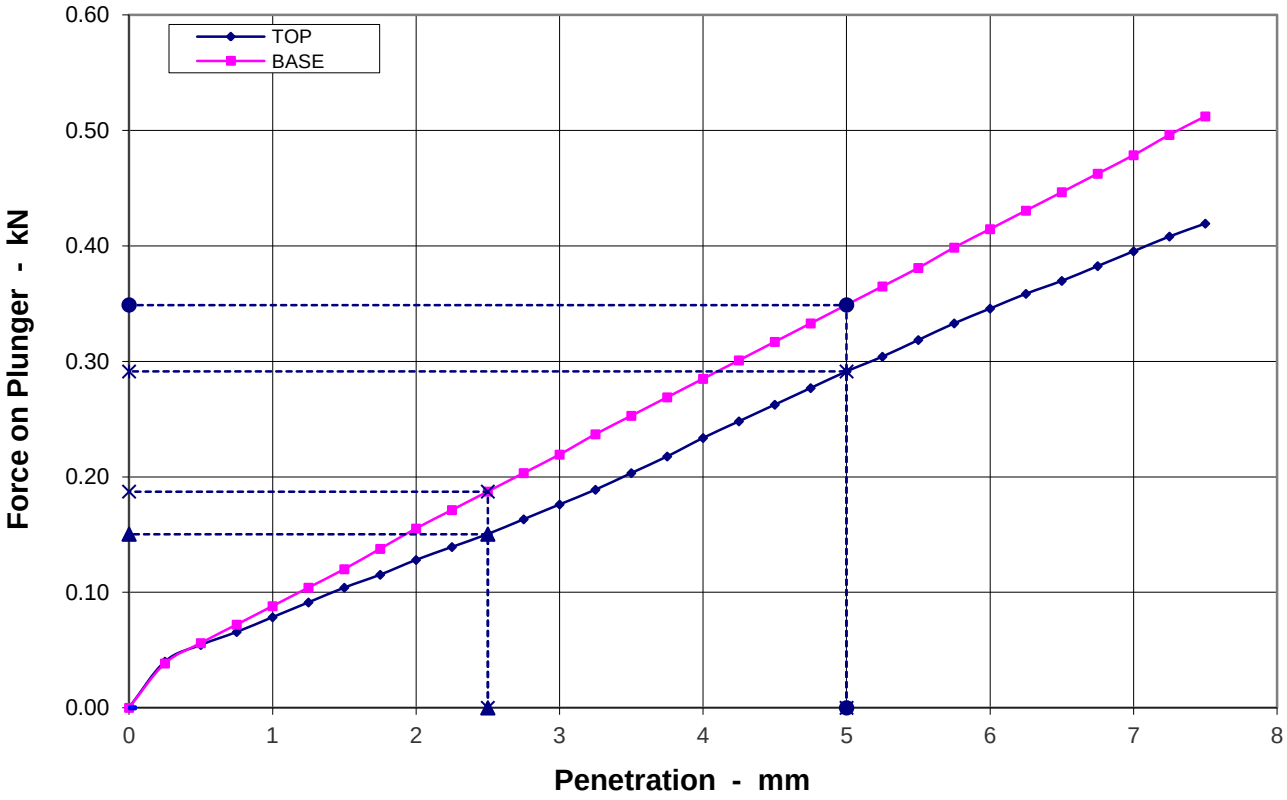
K4 SOILS

Report of California Bearing Ratio Test

BS 1377 : Part 4 : 1990:Clause 7.4

Project name:	Hollyacre, Toddington Lane			**Samples Received:**	25/01/2013
				Project Started:	28/01/2013
Client:	Opus International Consultants (UK) Ltd			**Testing started:**	04/02/2013
Project no:	E-E1524	**Our job /report no:**	13990	**Date reported:**	07/02/2013
BH / TP no:	TP1	**Sample no:**	B	**Depth (m):**	0.50

Soil Description: Brown slightly fine sandy silty CLAY with rare fine gravel



Preparation	Method of Compaction		
	Rammer compaction with specified effort		
	Hammer type		2.5kg Rammer
	Soaking Period	days	-
	Amount of Swell	mm	-

Sample Conditions		
Natural Moisture Content	%	24
Moisture Content - TOP	%	24
Moisture Content - BASE	%	24
Bulk Density	Mg/m³	1.89
Dry Density	Mg/m³	1.52

Test Conditions		
Sample Retained on 20 mm sieve	%	0.0
Sample Retained on 37.5 mm sieve	%	0.0
Seating Load - TOP	N	10
Seating Load - BASE	N	10
Surcharge	kg	4.4

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.1	1.4
5	1.5	1.7
Accepted CBR	**1.5**	**1.7**

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Approved Signatories: K.Phaure(Tech.Mgr)
J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 07/02/2013

UKAS TESTING

2519

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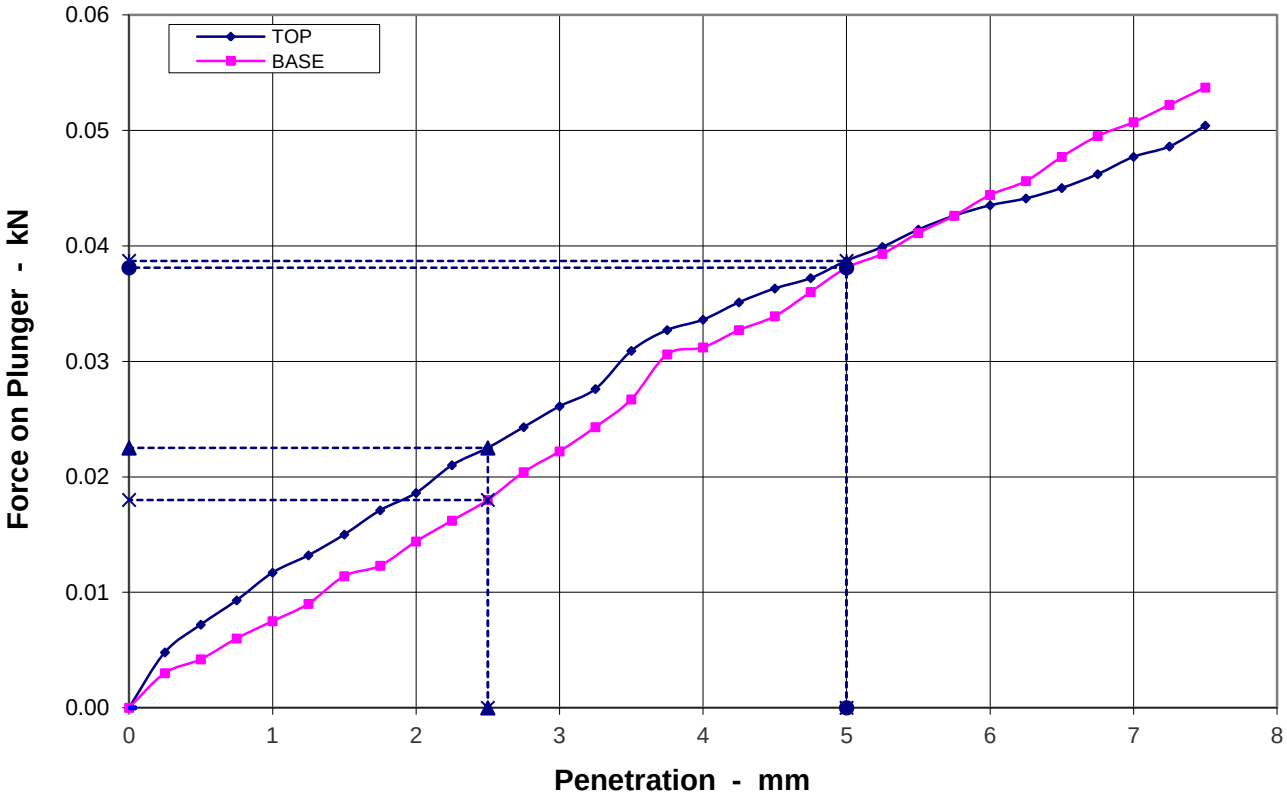
K4 SOILS

Report of California Bearing Ratio Test

BS 1377 : Part 4 : 1990:Clause 7.4

Project name:	Hollyacre, Toddington Lane			**Samples Received:**	25/01/2013
				Project Started:	28/01/2013
Client:	Opus International Consultants (UK) Ltd			**Testing started:**	04/02/2013
Project no:	E-E1524	**Our job /report no:**	13990	**Date reported:**	07/02/2013
BH / TP no:	TP5	**Sample no:**	B	**Depth (m):**	0.70

Soil Description: Dark greenish grey slightly sandy silty CLAY with rare fine gravel



Preparation	Method of Compaction		
	Rammer compaction with specified effort		
	Hammer type		2.5kg Rammer
	Soaking Period	days	-
	Amount of Swell	mm	-

Sample Conditions		
Natural Moisture Content	%	29
Moisture Content - TOP	%	29
Moisture Content - BASE	%	29
Bulk Density	Mg/m³	1.93
Dry Density	Mg/m³	1.49

Test Conditions		
Sample Retained on 20 mm sieve	%	0.0
Sample Retained on 37.5 mm sieve	%	0.0
Seating Load - TOP	N	10
Seating Load - BASE	N	10
Surcharge	kg	4.4

Penetration mm	CBR Values %	
	TOP	BASE
2.5	0.17	0.14
5	0.19	0.19
Accepted CBR	**0.19**	**0.19**

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Initials: kp
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UKAS TESTING 2519

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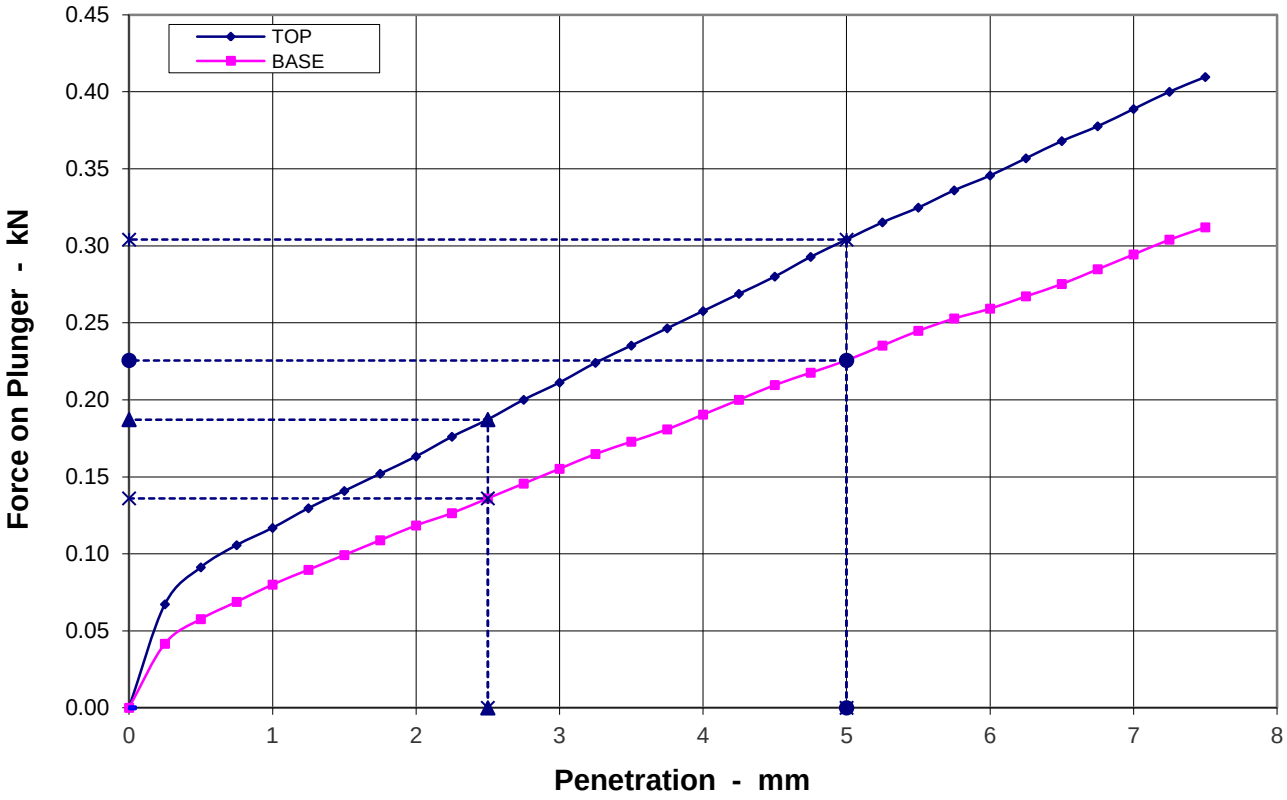
K4 SOILS

Report of California Bearing Ratio Test

BS 1377 : Part 4 : 1990:Clause 7.4

Project name:	Hollyacre, Toddington Lane			**Samples Received:**	25/01/2013
				Project Started:	28/01/2013
Client:	Opus International Consultants (UK) Ltd			**Testing started:**	04/02/2013
Project no:	E-E1524	**Our job /report no:**	13990	**Date reported:**	07/02/2013
BH / TP no:	TP6	**Sample no:**	B	**Depth (m):**	0.70

Soil Description: Brown sandy silty CLAY



Preparation	Method of Compaction		
	Rammer compaction with specified effort		
	Hammer type		2.5kg Rammer
	Soaking Period	days	-
	Amount of Swell	mm	-

Sample Conditions		
Natural Moisture Content	%	23
Moisture Content - TOP	%	23
Moisture Content - BASE	%	23
Bulk Density	Mg/m³	2.10
Dry Density	Mg/m³	1.70

Test Conditions		
Sample Retained on 20 mm sieve	%	0.0
Sample Retained on 37.5 mm sieve	%	0.0
Seating Load - TOP	N	10
Seating Load - BASE	N	10
Surcharge	kg	4.4

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.4	1.0
5	1.5	1.1
Accepted CBR	**1.5**	**1.1**

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J.Phaure(Lab.Mgr)

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UKAS TESTING 2519

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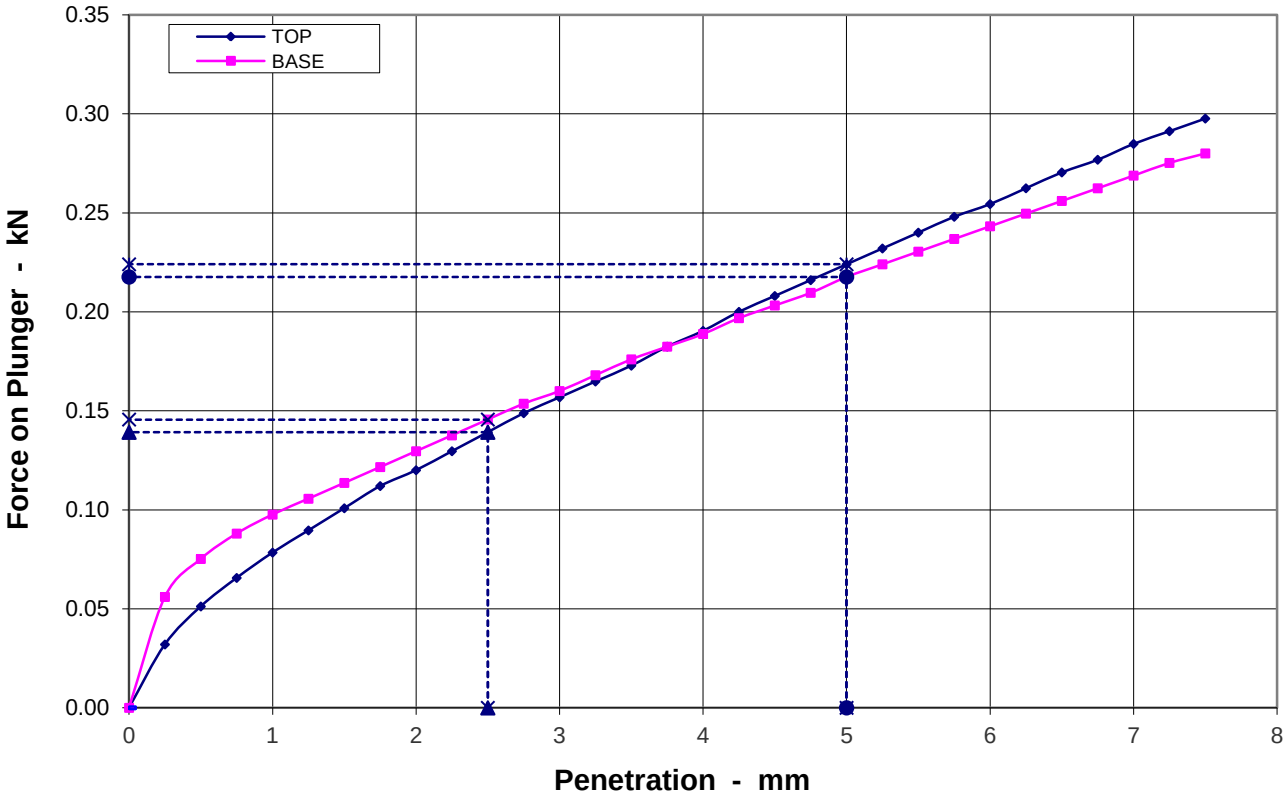
K4 SOILS

Report of California Bearing Ratio Test

BS 1377 : Part 4 : 1990:Clause 7.4

Project name:	Hollyacre, Toddington Lane			**Samples Received:**	25/01/2013
				Project Started:	28/01/2013
Client:	Opus International Consultants (UK) Ltd			**Testing started:**	04/02/2013
Project no:	E-E1524	**Our job /report no:**	13990	**Date reported:**	07/02/2013
BH / TP no:	TP11	**Sample no:**	B	**Depth (m):**	1.10

Soil Description: Brown slightly gravelly silty sandy CLAY (gravel is fmc and sub-angular to sub-rounded)



Preparation	Method of Compaction		
	Rammer compaction with specified effort		
	Hammer type		2.5kg Rammer
	Soaking Period	days	-
	Amount of Swell	mm	-

Sample Conditions		
Natural Moisture Content	%	22
Moisture Content - TOP	%	22
Moisture Content - BASE	%	22
Bulk Density	Mg/m³	2.02
Dry Density	Mg/m³	1.66

Test Conditions		
Sample Retained on 20 mm sieve	%	0.6
Sample Retained on 37.5 mm sieve	%	0.0
Seating Load - TOP	N	10
Seating Load - BASE	N	10
Surcharge	kg	4.4

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.1	1.1
5	1.1	1.1
Accepted CBR	**1.1**	**1.1**

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UKAS TESTING

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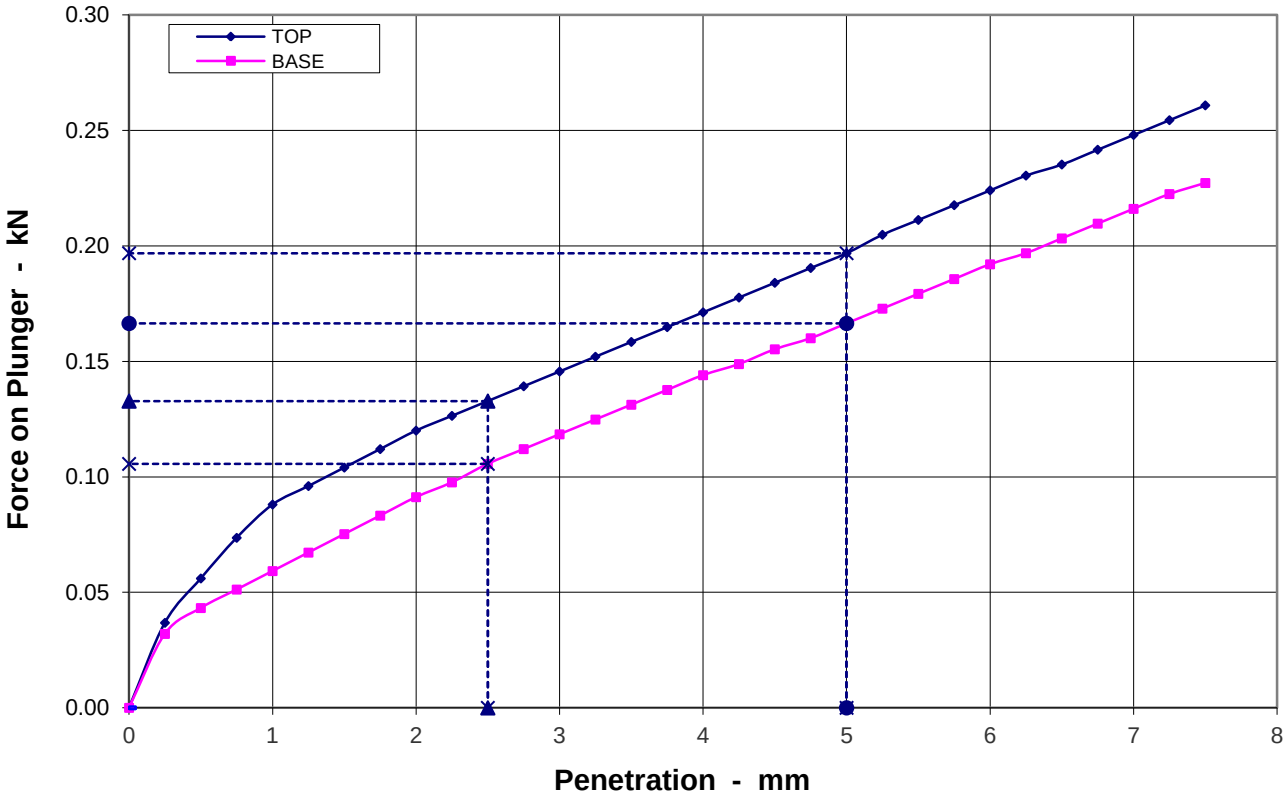
K4 SOILS

Report of California Bearing Ratio Test

BS 1377 : Part 4 : 1990:Clause 7.4

Project name:	Hollyacre, Toddington Lane			**Samples Received:**	25/01/2013
				Project Started:	28/01/2013
Client:	Opus International Consultants (UK) Ltd			**Testing started:**	04/02/2013
Project no:	E-E1524	**Our job /report no:**	13990	**Date reported:**	07/02/2013
BH / TP no:	TP12	**Sample no:**	B	**Depth (m):**	0.80

Soil Description: Brown sandy silty CLAY with occasional fine rootlets



Preparation	Method of Compaction		
	Rammer compaction with specified effort		
	Hammer type		2.5kg Rammer
	Soaking Period	days	-
	Amount of Swell	mm	-

Sample Conditions		
Natural Moisture Content	%	22
Moisture Content - TOP	%	22
Moisture Content - BASE	%	22
Bulk Density	Mg/m³	2.01
Dry Density	Mg/m³	1.65

Test Conditions		
Sample Retained on 20 mm sieve	%	0.0
Sample Retained on 37.5 mm sieve	%	0.0
Seating Load - TOP	N	10
Seating Load - BASE	N	10
Surcharge	kg	4.4

Penetration mm	CBR Values %	
	TOP	BASE
2.5	1.0	0.80
5	1.0	0.83
Accepted CBR	**1.0**	**0.83**

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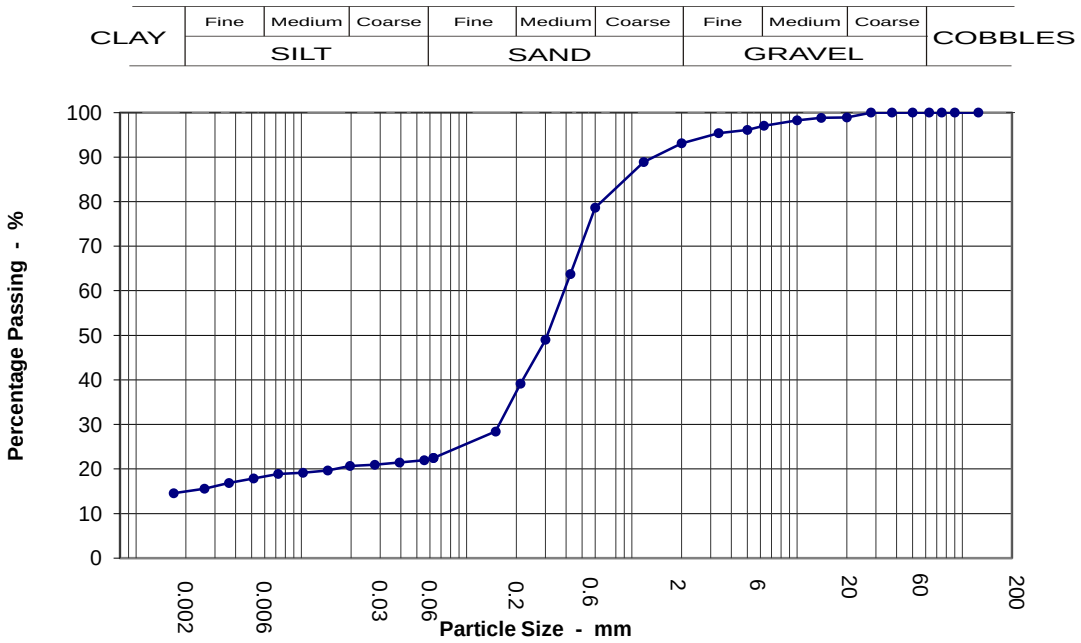
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Date: 07/02/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	13990
		Project No:	E-E1524
Location	Hollyacre, Toddington Lane	Borehole / Trial Pit No:	TP8
		Depth	2.80 m
Visual Soil Description	Orange brown slightly gravelly slightly silty slightly clayey SAND (gravel is fmc and sub-angular to rounded)	Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.055	22
90	100	0.039	21
75	100	0.028	21
63	100	0.020	21
50	100	0.014	20
37.5	100	0.010	19
28	100	0.007	19
20	99	0.005	18
14	99	0.004	17
10	98	0.003	16
6.3	97	0.002	15
5	96		
3.35	95		
2	93		
1.18	89		
0.6	79		
0.425	64		
0.3	49		
0.212	39		
0.15	28		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving Sedimentation	Clause Clause 9.5
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	6.9
Sand	70.8
Silt	7.4
Clay	14.9

Grading Analysis	
D100	125.0
D60	0.4
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
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Watford Herts WD18 9RU.
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Approved Signatories:
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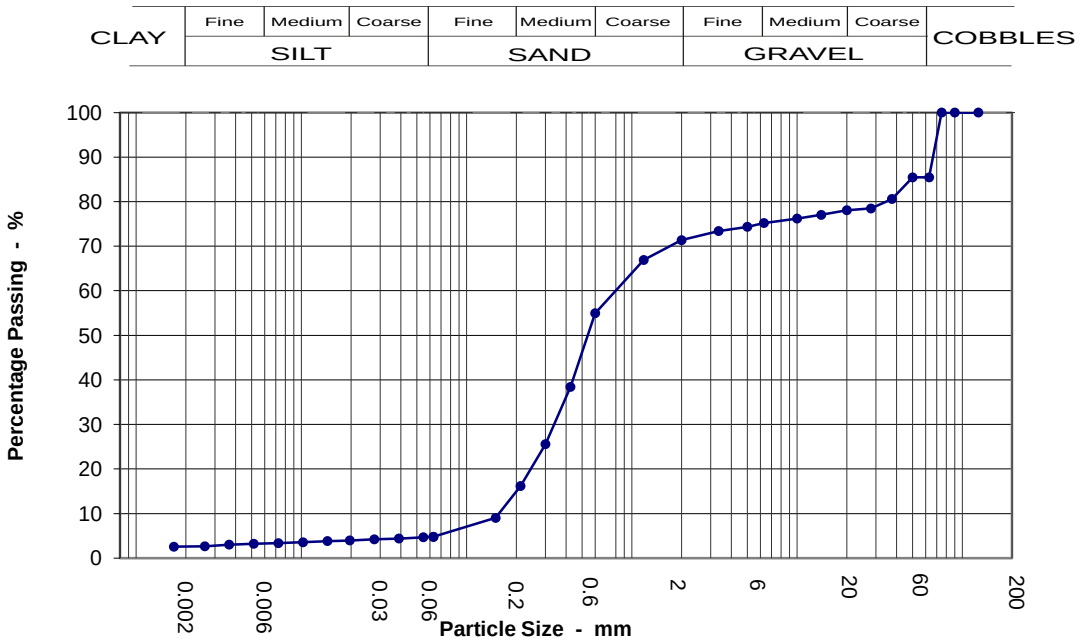
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Initials: kp
Date: 07/02/2013

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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	13990
		Project No:	E-E1524
Location	Hollyacre, Toddington Lane	Borehole / Trial Pit No:	TP10
		Depth	3.10 m
Visual Soil Description	Orange brown slightly silty slightly clayey gravelly SAND (gravel is fmc and cobble sized and sub-angular to rounded)	Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.055	5
90	100	0.039	4
75	100	0.028	4
63	85	0.020	4
50	85	0.014	4
37.5	81	0.010	4
28	78	0.007	3
20	78	0.005	3
14	77	0.004	3
10	76	0.003	3
6.3	75	0.002	3
5	74		
3.35	73		
2	71		
1.18	67		
0.6	55		
0.425	38		
0.3	26		
0.212	16		
0.15	9		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving Sedimentation	Clause Clause 9.5
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	14.6
Gravel	14.1
Sand	66.6
Silt	2.2
Clay	2.6

Grading Analysis	
D100	125.0
D60	0.8
D10	0.2
Uniformity Coefficient	5

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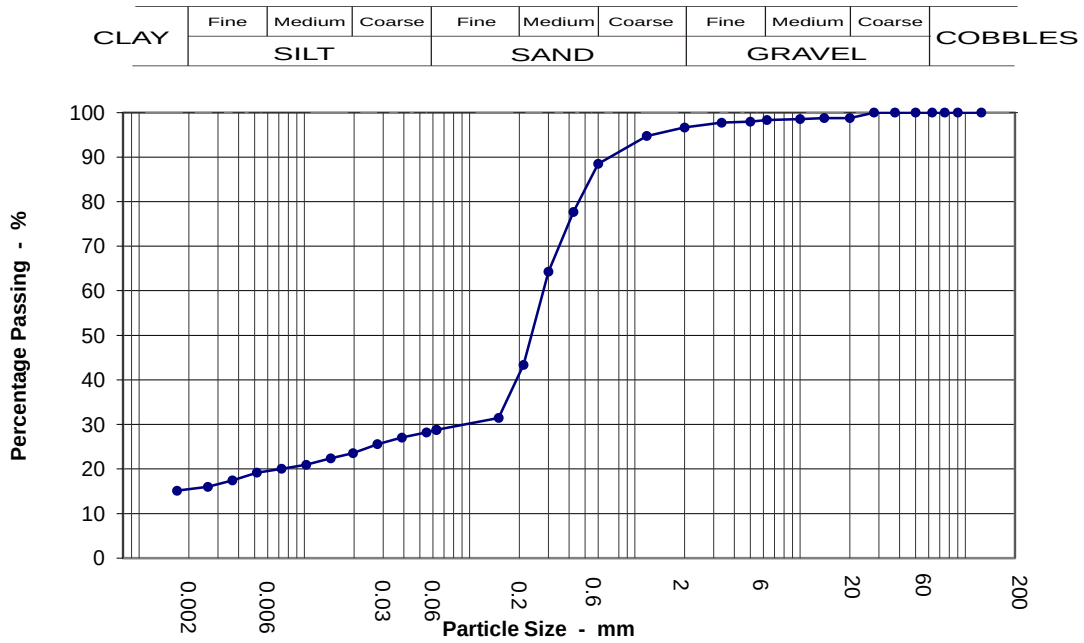
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Initials: kp
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2519

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	13990
		Project No:	E-E1524
Location	Hollyacre, Toddington Lane	Borehole / Trial Pit No:	TP11
		Depth	2.00 m
Visual Soil Description	Orange brown slightly gravelly slightly silty slightly clayey SAND (gravel is fmc and sub-angular to rounded)	Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.055	28
90	100	0.039	27
75	100	0.028	26
63	100	0.020	24
50	100	0.014	22
37.5	100	0.010	21
28	100	0.007	20
20	99	0.005	19
14	99	0.004	17
10	99	0.003	16
6.3	98	0.002	15
5	98		
3.35	98		
2	97		
1.18	95		
0.6	88		
0.425	78		
0.3	64		
0.212	43		
0.15	31		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving Sedimentation	Clause Clause 9.5
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	3.4
Sand	68.1
Silt	13.2
Clay	15.4

Grading Analysis	
D100	125.0
D60	0.3
D10	
Uniformity Coefficient	N/A

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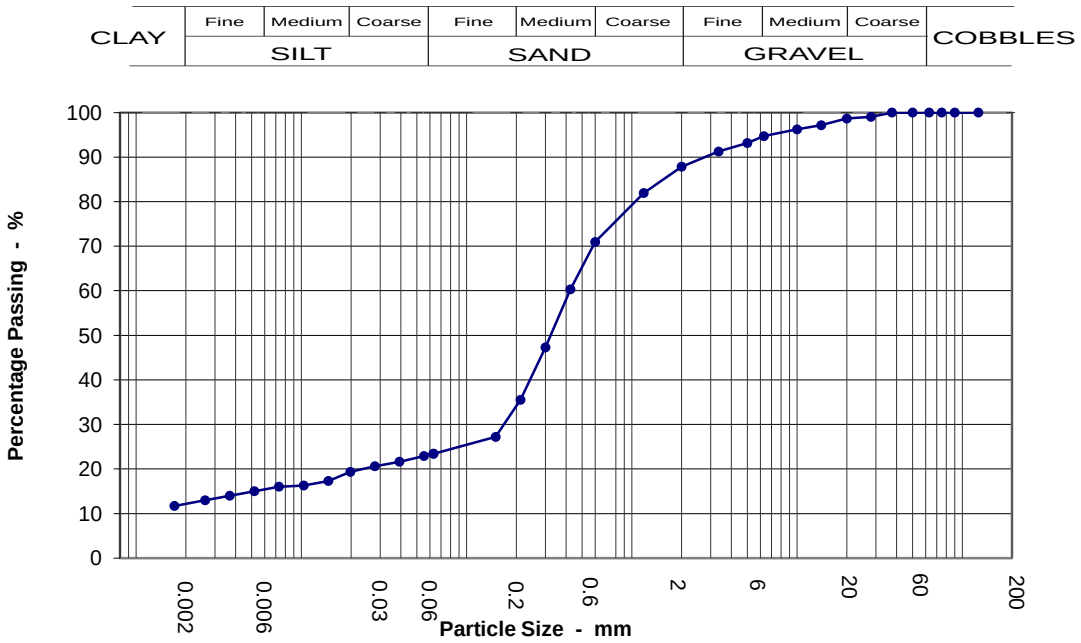
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K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	13990
		Project No:	E-E1524
Location	Hollyacre, Toddington Lane	Borehole / Trial Pit No:	TP12
		Depth	2.10 m
Visual Soil Description	Orange brown slightly gravelly slightly silty slightly clayey SAND with occasional brown silty clay lumps (gravel is fmc and sub-angular to rounded)	Sample Type/No	B -



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.055	23
90	100	0.039	22
75	100	0.028	21
63	100	0.020	19
50	100	0.015	17
37.5	100	0.010	16
28	99	0.007	16
20	99	0.005	15
14	97	0.004	14
10	96	0.003	13
6.3	95	0.002	12
5	93		
3.35	91		
2	88		
1.18	82		
0.6	71		
0.425	60		
0.3	47		
0.212	36		
0.15	27		
0.063	23		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause
Sedimentation	Clause 9.5
Suitable Amount Of Sample Received	Yes

Sample Proportions	
Cobbles	0.0
Gravel	12.2
Sand	64.6
Silt	11.1
Clay	12.1

Grading Analysis	
D100	125.0
D60	0.4
D10	
Uniformity Coefficient	N/A

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2519

APPENDIX E

In-situ Test Results

ARUN DISTRICT COUNCIL LU/116/13/

SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

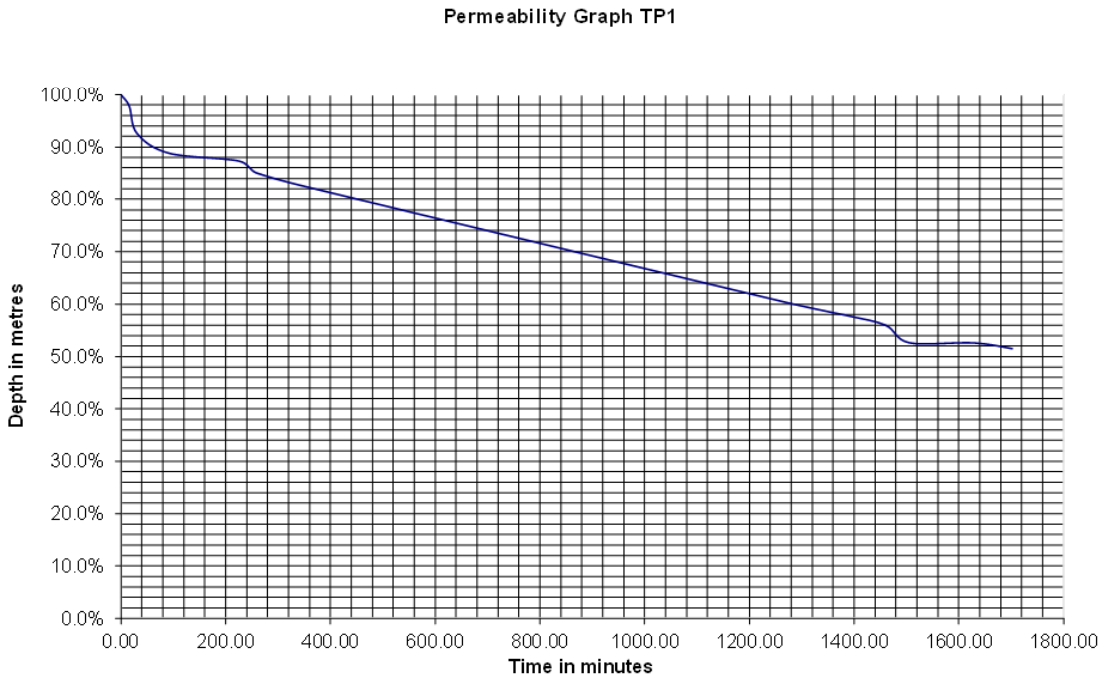
Job No: E-E1524 Trial Hole: TP1

Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.370	1.34	100.0%
16.00	1.400	1.31	97.8%
31.00	1.470	1.24	92.5%
92.00	1.520	1.19	88.8%
225.00	1.540	1.17	87.3%
258.00	1.570	1.14	85.1%
336.00	1.600	1.11	82.8%
1265.00	1.900	0.81	60.4%
1386.00	1.935	0.78	57.8%
1460.00	1.960	0.75	56.0%
1506.00	2.005	0.71	52.6%
1628.00	2.005	0.71	52.6%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%
1702.00	2.020	0.69	51.5%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to grpah sheet for calculation

Pit Size		Time in mins	
Length	1.60	0	75%
Width	0.48	0	25%
Depth	2.71		

Infiltration Rate from75%-25% **not valid**



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP1

Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.370	0.65	100.0%
16.00	1.400	0.62	95.4%
31.00	1.470	0.55	84.6%
92.00	1.520	0.50	76.9%
225.00	1.540	0.48	73.8%
258.00	1.570	0.45	69.2%
336.00	1.600	0.42	64.6%
1265.00	1.900	0.12	18.5%
1386.00	1.935	0.09	13.1%
1460.00	1.960	0.06	9.2%
1506.00	2.005	0.02	2.3%
1628.00	2.005	0.02	2.3%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%
1702.00	2.020	0.00	0.0%

INFILTRATION CALCULATED FROM 75%-25% WATER DEPTH RANGE

Pit Size		Time in mins	
Length	1.60		75%
Width	0.48		25%
Depth	2.02		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP1



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Hampshire
PO16 0QS

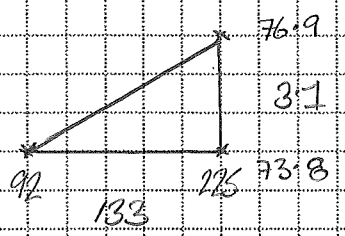
PROJECT NO: E-E1524 SHEET NO: REV :

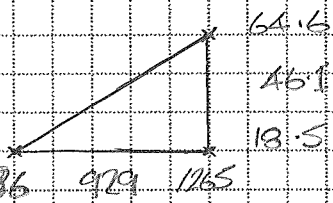
DESIGNED: CDS REVIEWED: AC DATE: JAN 13

Telephone: 01329 822021 Facsimile: 01329 825274 email: fareham@opusinternational.co.uk

PROJECT: HOLLYACRE, TODDINGTON LANE TP1

As the full depth test was not completed between 75% to 25% effective depth. Therefore the soil infiltration rate calculation should be based on the time for the fall of water level from 75% to 25% of the actual maximum water depth achieved in the test





$133 - 42.9032 \times 1.2 = 51.4838$ (3:1)

$= 225 - 51.483 = 173.5$ mins 30secs

$929 \times 6.5 = 130.9869$ (46.1)

$1065 - 130.9869 = 1134$ m

Time of outflow from 75% to 25% effective depth $= 1134 - 173.50$

$= \underline{960 \text{ mins } 30\text{secs}}$



Water level during the test

$V_{75-25} = 1.60 \times 0.48 \times (1.8575 - 1.5325) = \underline{0.2496 \text{ m}^3}$

$A_{p50} = (1.60 \times 0.48) + (1.60 \times 2 \times (2.71 - 1.695)) + (0.48 \times 2 \times (2.71 - 1.695))$

$= 0.768 + 3.248 + 0.9744$

$= \underline{4.9904 \text{ m}^2}$

Soil Infiltration Rate $= \dfrac{0.2496}{4.9904 \times 960.5 \times 60} = \underline{8.68 \times 10^{-7}}$

ECF03/04/03

ARUN DISTRICT COUNCIL LU/116/13/

SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP2

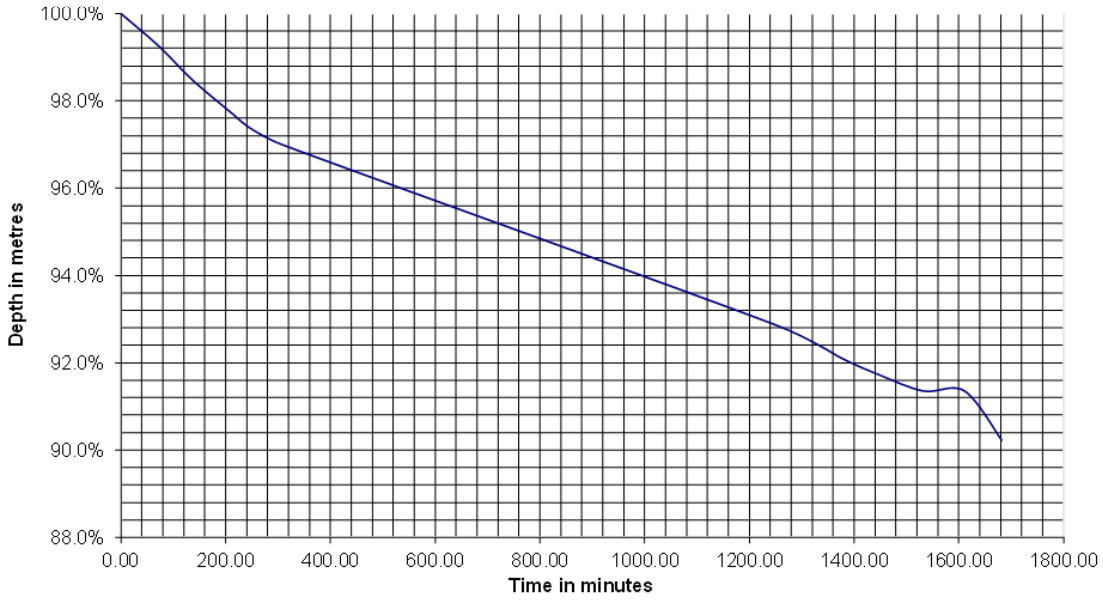
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.770	1.33	100.0%
73.00	1.780	1.32	99.2%
135.00	1.790	1.31	98.5%
209.00	1.800	1.30	97.7%
248.00	1.805	1.30	97.4%
309.00	1.810	1.29	97.0%
1252.00	1.865	1.24	92.9%
1376.00	1.875	1.23	92.1%
1447.00	1.880	1.22	91.7%
1532.00	1.885	1.22	91.4%
1611.00	1.885	1.22	91.4%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%
1682.00	1.900	1.20	90.2%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to grpah sheet for calculation

Pit Size		Time in mins	
Length	1.70	0	75%
Width	0.47	0	25%
Depth	3.10		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP2



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP2

Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.770	0.13	100.0%
73.00	1.780	0.12	92.3%
135.00	1.790	0.11	84.6%
209.00	1.800	0.10	76.9%
248.00	1.805	0.10	73.1%
309.00	1.810	0.09	69.2%
1252.00	1.865	0.03	26.9%
1376.00	1.875	0.02	19.2%
1447.00	1.880	0.02	15.4%
1532.00	1.885	0.01	11.5%
1611.00	1.885	0.01	11.5%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%
1682.00	1.900	0.00	0.0%

INFILTRATION CALCULATED FROM 75%-25% WATER DEPTH RANGE

Pit Size		Time in mins	
Length	1.70		75%
Width	0.47		25%
Depth	1.90		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP2



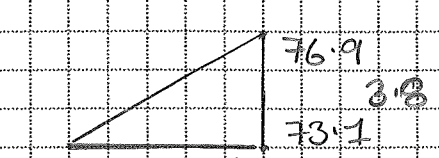
OPUS
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Modulus House
Salterns Lane
Fareham
Hampshire
PO16 0QS

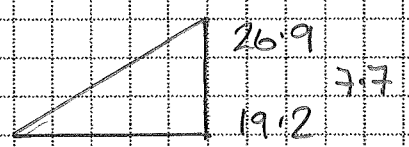
PROJECT NO: E-E1524 SHEET NO: REV :

DESIGNED: CDS REVIEWED: AC DATE: JAN 13

Telephone: 01329 822021 Facsimile: 01329 825274 email: fareham@opusinternational.co.uk

PROJECT: HOLLYACRE, TODDINGTON LANE TP2





$39 \times 1.9 = 19.5$ (3.8)

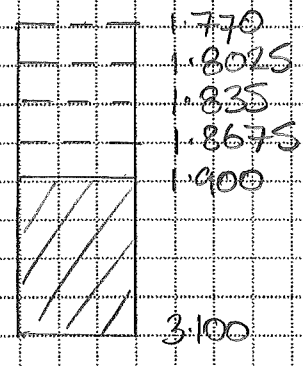
$248 - 19.5 = 228.5$ mins

$124 \times 1.9 = 30.597$ (7.7)

$1252 + 30.597 = 1221.6$ mins

Time of outflow from 75% to 25% effective depth

$= 1221.6 - 228.5 = 993.1$ mins



$V_{75-25} = 1.70 \times 0.48 (1.8675 - 1.8025) = 0.05304\ m^3$

$A_{750} = (1.70 \times 0.48) + (1.70 \times 2 \times (3.1 - 1.835)) + (0.48 \times 2 \times (3.1 - 1.835))$

$= 0.816 + 4.301 + 1.214$

$= 6.3314$

Soil Infiltration Rate $= \frac{0.05304}{6.3314 \times 993.1 \times 60} = 1.406 \times 10^{-7}$

EGN03/04/03

ARUN DISTRICT COUNCIL LU/116/13/

SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP3

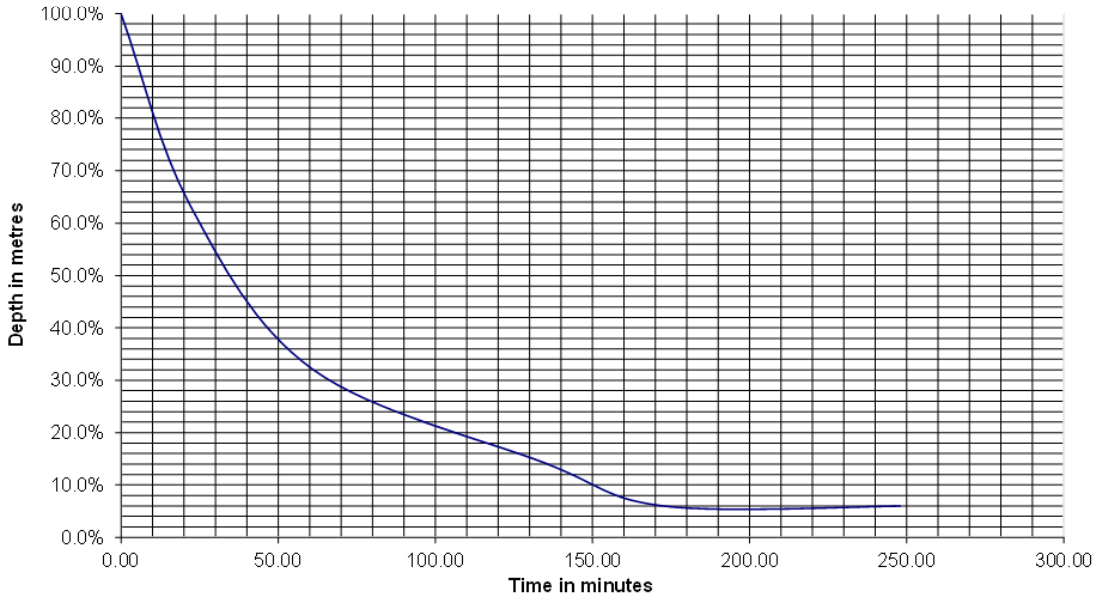
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.990	0.67	100.0%
22.00	2.235	0.43	63.4%
61.00	2.445	0.22	32.1%
135.00	2.565	0.10	14.2%
173.00	2.620	0.04	6.0%
248.00	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
	2.620	0.04	6.0%
248.00	2.620	0.04	6.0%

INFILTRATION CALCULATED FROM 75%-25% WATER DEPTH RANGE

Pit Size		Time in mins	
Length	1.70	15	75%
Width	0.48	90.5	25%
Depth	2.66		

Infiltration Rate from75%-25% **2.65064E-05**

Permeability Graph TP3



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP4

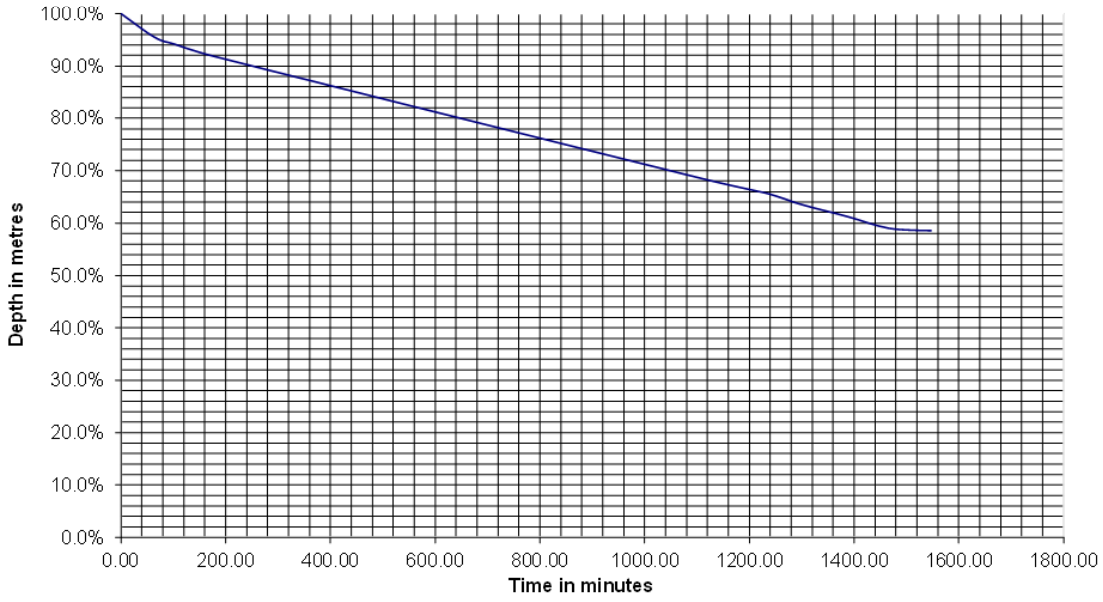
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.740	1.11	100.0%
64.00	1.790	1.06	95.5%
103.00	1.805	1.05	94.1%
176.00	1.830	1.02	91.9%
1111.00	2.090	0.76	68.5%
1230.00	2.120	0.73	65.8%
1301.00	2.145	0.71	63.5%
1387.00	2.170	0.68	61.3%
1467.00	2.195	0.66	59.0%
1547.00	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
	2.200	0.65	58.6%
1437.00	2.200	0.65	58.6%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to grpah sheet for calculation

Pit Size		Time in mins	
Length	1.75	0	75%
Width	0.48	0	25%
Depth	2.85		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP4



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP4

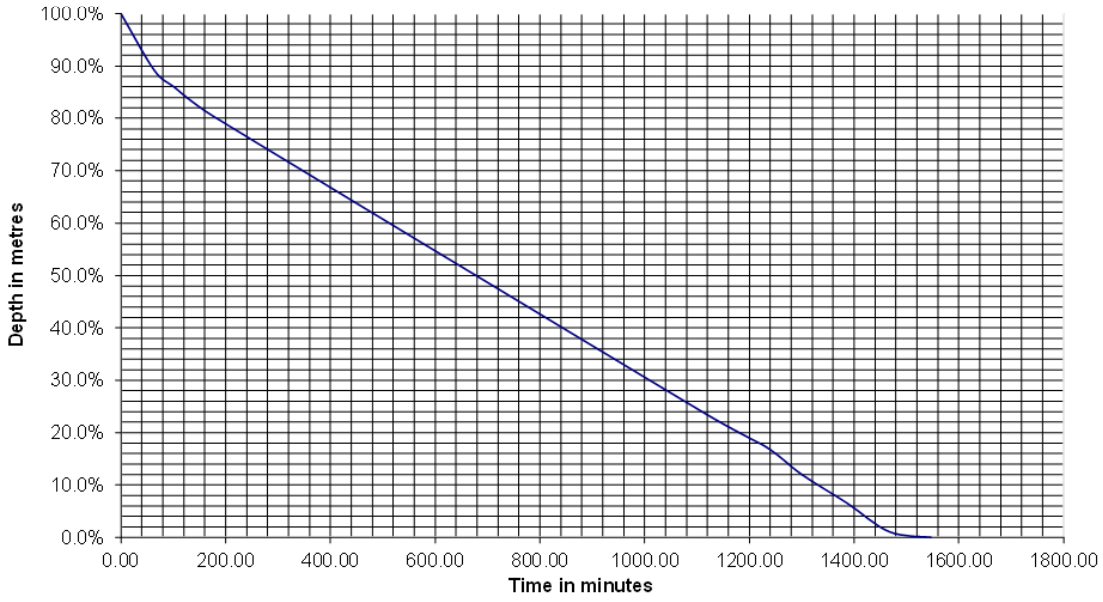
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.740	0.46	100.0%
64.00	1.790	0.41	89.1%
103.00	1.805	0.40	85.9%
176.00	1.830	0.37	80.4%
1111.00	2.090	0.11	23.9%
1230.00	2.120	0.08	17.4%
1301.00	2.145	0.06	12.0%
1387.00	2.170	0.03	6.5%
1467.00	2.195	0.01	1.1%
1547.00	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
	2.200	0.00	0.0%
1437.00	2.200	0.00	0.0%

INFILTRATION CALCULATED FROM 75%-25% WATER DEPTH RANGE

Pit Size		Time in mins	
Length	1.75	0	75%
Width	0.48	0	25%
Depth	2.20		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP4



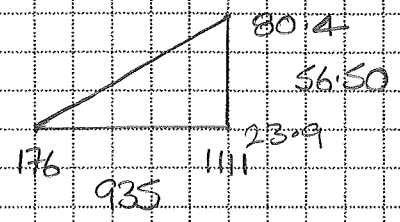
Fareham Office
Opus International Consultants (UK) Ltd
Modulus House
Salterns Lane
Fareham
Hampshire
PO16 0QS

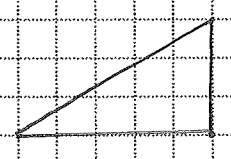
PROJECT NO: E-E1524 SHEET NO: REV :

DESIGNED: CDS REVIEWED: AC DATE: JAN 13

Telephone: 01329 822021 Facsimile: 01329 825274 email: fareham@opusinternational.co.uk

PROJECT: HOLLYACRE, TODDINGTON LANE TP4

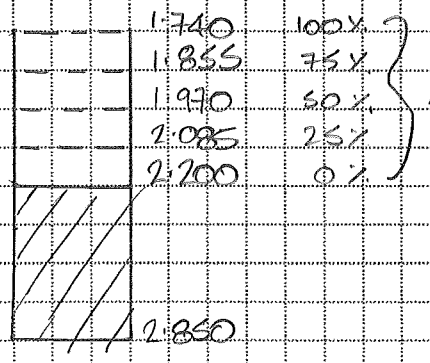




$\frac{935}{56.5} \times 5.4 = 89.3628$ $\frac{935}{56.5} \times 1.1 = 18.2035$

$176 + 89.3628 = 265.36$ $1111 - 18.2035 = 1092.7$

Time of outflow from 75% to 25% effective depth = 1093 − 265 = 828



$V_{75-25} = 1.75 \times 0.48 (2.085 - 1.855) = 0.1932\ m^3$

$Area = (1.75 \times 0.48) + (1.75 \times 2(2.85 - 1.97)) + (0.48 \times 2(2.85 - 1.97))$

$= 0.84 + 3.08 + 0.8448$

$= 4.7648\ m^2$

Soil Infiltration rate $= \frac{0.1932}{4.7648 \times 828 \times 60} = 8.16 \times 10^{-7}\ m/s$

ECFD3/04/03

SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP5

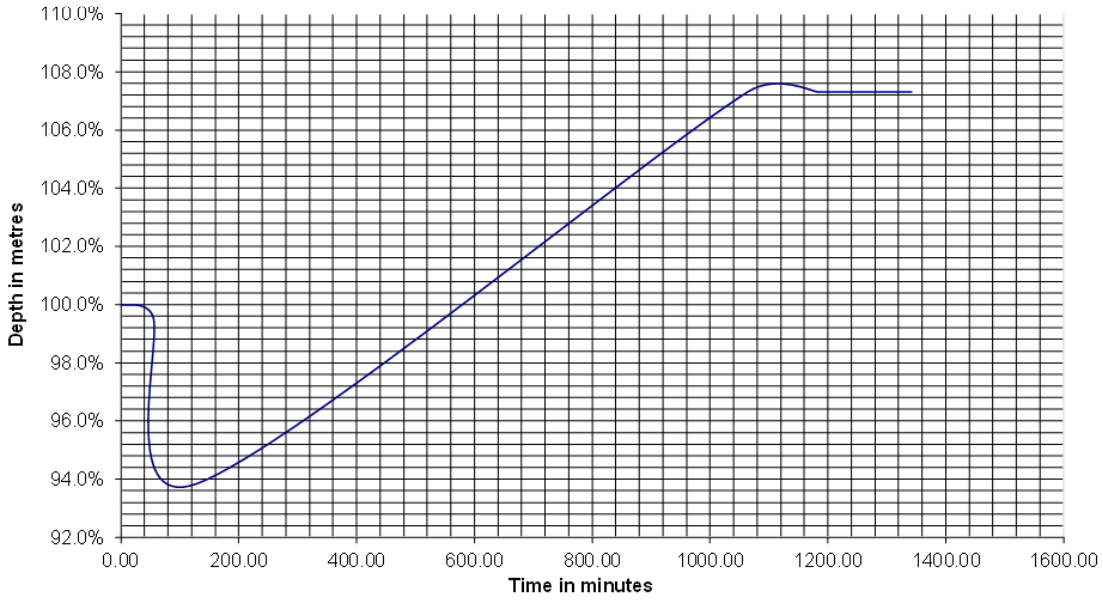
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.110	1.30	100.0%
54.00	1.115	1.30	99.6%
129.00	1.190	1.22	93.8%
1064.00	1.015	1.40	107.3%
1183.00	1.015	1.40	107.3%
1254.00	1.015	1.40	107.3%
1342.00	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
	1.015	1.40	107.3%
1342.00	1.015	1.40	107.3%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to grpah sheet for calculation

Pit Size		Time in mins	
Length	1.70	0	75%
Width	0.58	0	25%
Depth	2.41		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP5



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP6

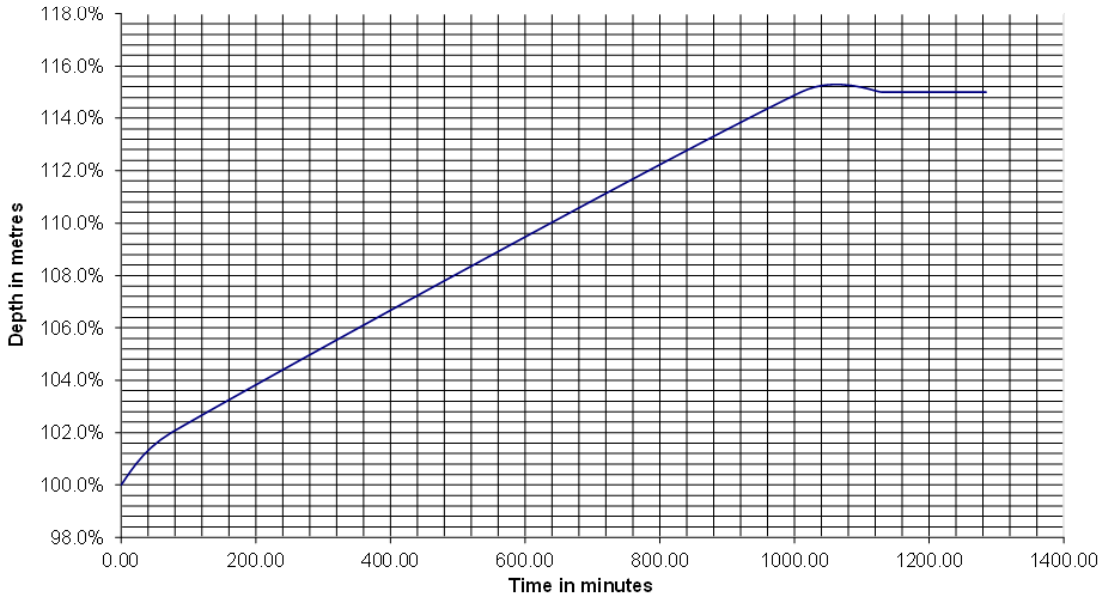
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.780	1.00	100.0%
75.00	1.760	1.02	102.0%
1010.00	1.630	1.15	115.0%
1130.00	1.630	1.15	115.0%
1200.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
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1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%
1285.00	1.630	1.15	115.0%

WARNING DOES NOT FALL TO 25% OF START DEPTH-Refer to grpah sheet for calculation

Pit Size		Time in mins	
Length	1.75	0	75%
Width	0.48	0	25%
Depth	2.78		

Infiltration Rate from75%-25% **not valid**

Permeability Graph TP6



SOAKAWAY TEST RESULTS & SOILS INFILTRATION RATE

Site: Hollyacre, Toddington Lane

Job No: E-E1524 Trial Hole: TP7

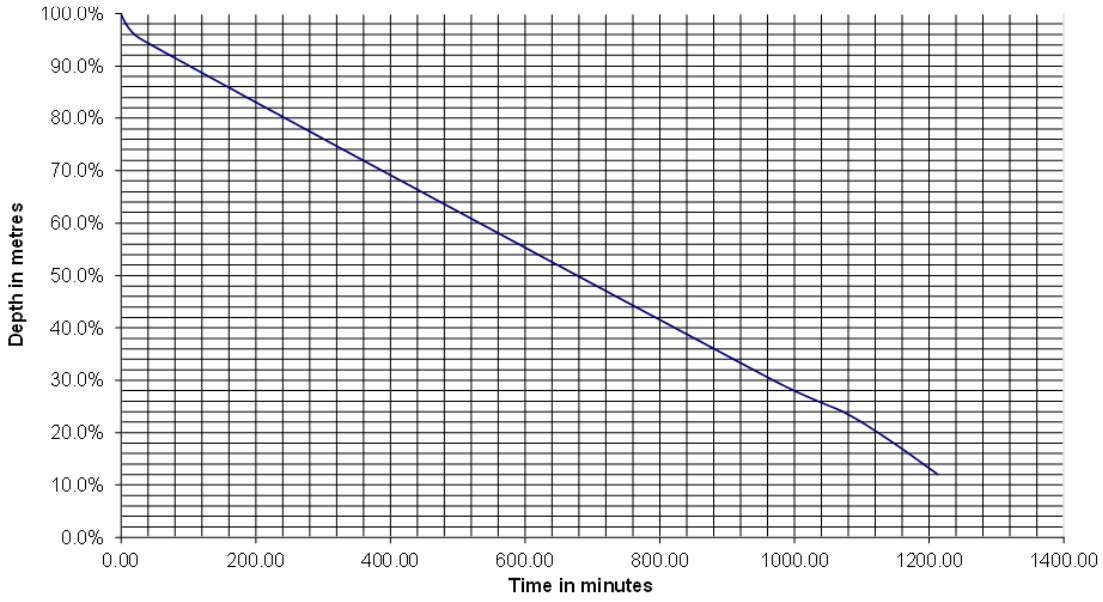
Time in minutes	Depth in meters to water surface	Depth in metres of water	Percentage of water depth at start
0.00	1.320	0.83	100.0%
29.00	1.360	0.79	95.2%
967.00	1.900	0.25	30.1%
1071.00	1.950	0.20	24.1%
1140.00	1.995	0.16	18.7%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
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1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%
1213.00	2.050	0.10	12.0%

INFILTRATION CALCULATED FROM 75%-25% WATER DEPTH RANGE

Pit Size		Time in mins	
Length	1.70	320	75%
Width	0.50	1056	25%
Depth	2.15		

Infiltration Rate from75%-25% **2.98505E-06**

Permeability Graph TP7



HOLLYACRE: CLEGG IMPACT SOIL TESTER RESULTS

Trial Pit Location	Test Depth (m)	Brief Description of Strata	Drop					(mm)	Approx CBR%	Average CBR
			1	2	3	4	5			
TP1	0.5m	Orange/medium brown slightly silty, slightly clayey SAND. Sand is fine to medium grained.	6	6	6	6	6	16	5.95	6.77
	0.5m		7	7	7	7	7	18	7.18	
	0.5m		6	6	7	7	7	19	7.18	
TP3	0.7m	Firm consistency orange slightly silty sandy CLAY. Sand is fine to coarse grained.	4	4	5	5	5	24	4.84	4.84
	0.7m		5	5	5	5	5	30	4.84	
	0.7m		4	5	5	5	5	25	4.84	
TP4	0.5m	Firm medium brown/orange consistency slightly silty, slightly sandy medium strength CLAY. Sand is fine to coarse grained.	4	4	4	5	5	20	4.84	3.88
	0.5m		3	3	3	3	3	20	3.84	
	0.5m		5	5	5	4	4	20	2.96	
TP5	0.65m	Firm consistency medium brown/orange slightly silty, slightly sandy medium strength CLAY. Sand is fine to coarse grained.	4	4	4	4	4	30	3.84	3.25
	0.65m		4	4	4	3	3	50	2.96	
	0.65m		3	3	3	3	3	40	2.96	
TP9	0.5m	MADEGROUND: comprising dark grey silty slightly sandy clay. Sand is fine to coarse grained.	4	4	4	4	5	20	3.84	4.54
	0.5m		4	4	4	4	4	25	3.84	
	0.5m		6	6	6	6	6	20	5.95	
TP9	0.9m	Firm consistency dark grey silty slightly sandy high strength CLAY. Sand is fine to coarse grained sand.	3	4	4	4	4	30	3.84	4.88
	0.9m		5	5	5	5	6	30	4.84	
	0.9m		3	5	6	6	7	35	5.95	
TP10	0.45m	Firm/stiff consistency grey with red veins silty slightly sandy CLAY. Sand is fine to coarse grained.	4	4	4	4	5	20	3.84	5.25
	0.45m		7	6	6	6	6	25	5.95	
	0.45m		5	6	6	6	6	20	5.95	
TP11	1.10m	Firm consistency orange/medium brown slightly silty slightly sandy high strength CLAY.	6	6	5	5	5	40	4.84	5.58
	1.10m		6	6	6	6	6	35	5.95	
	1.10m		6	6	6	6	6	30	5.95	
TP12	0.50m	Firm consistency orange/medium brown slightly silty sandy CLAY. Sand is fine to coarse grained.	4	4	4	4	4	40	3.84	3.54
	0.50m		4	3	3	3	3	40	2.96	
	0.50m		3	4	4	4	4	40	3.84	
TP12	1.25m	Firm consistency orange/medium brown slightly silty sandy CLAY. Sand is fine to coarse grained.	3	4	4	4	4	60	3.84	4.17
	1.25m		5	5	5	5	5	40	4.84	
	1.25m		4	4	4	4	4	50	3.84	

E-E1524 Clegg Impact soil Tester

APPENDIX F

Conditions and Limitations

ARUN DISTRICT COUNCIL LU/116/13/

OPUS INTERNATIONAL CONSULTANTS (UK) LTD

SITE INVESTIGATIONS

CONDITIONS AND LIMITATIONS

1. The report is confidential to the clients stated in the report and has been prepared to their instructions for their own purposes and it is not permitted to disclose this report to other parties (except NHBC, Local Authority, the Client's own Solicitors and Professional Advisers) without the prior consent of Opus International Consultants (UK) Ltd.

2. The copyright of this report remains the property of Opus International Consultants (UK) Ltd.

3. No liability for the contents of this report is accepted to any parties other than the client stated in the report. No parties other than the client stated in the report should rely upon this report.

4. Attention is drawn to the fact that, whilst every effort is made to ensure the accuracy of the data and any conclusions derived from it, the possibility exists of variations in ground conditions around and between trial pits. No liability can be accepted for such variations or for agreed sampling rates/trial hole frequency.

5. Unless specifically stated otherwise in the report, any recommendations for works given in the report are outline only and are to be confirmed or modified as appropriate at detailed design stage.

6. No liability can be accepted for any services or other below ground items unless clearly shown on a plan to us in advance of any site works.

7. In accepting instructions to carry out site investigations it is assumed by us that our clients have all necessary permissions from existing owners and/or other authorities for such works to proceed. No liability is accepted for any claims arising as a result of anything contrary to this.

8. It is also assumed that a suitable clear access to the site is available for the required equipment and plant.

9. All holes are normally back-filled with excavated material compacted by its own weight only. Any excess spoil will be spread evenly around the direct area of excavation.

10. No chemical analysis of samples will be carried out unless specifically stated otherwise in the text of this report. Where fill, disturbed soil or an unfavourable earlier land usage is identified by the investigation the client is advised to have chemical analysis carried out subsequently. In any event no liability is accepted in respect of pollution. Similarly for radon and naturally occurring chemicals and gases.

11. Unless stated otherwise any desk study into the site history will be limited to information readily available at the Local Reference Library.

12. Under the Construction (Design & Management) Regulations latest edition, the Client has obligations for ensuring Health and Safety arising from any construction work. If it is proposed to proceed with construction work based upon information or recommendations contained in this report, these regulations probably apply. Further details of any issues arising from our report or the Clients obligations generally are available on request.

13. Unless dealt with more specifically above the Association of Consulting Engineers Conditions of Engagement, Short Form Agreement 2002 applies.

14. Laboratory testing where carried out is usually undertaken by sub-contract laboratories. No liability is accepted arising from any errors or omissions on the part of such laboratories.

ARUN DISTRICT COUNCIL LU/116/13/

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