FLOOD RISK ASSESSMENT
FOR
PROPOSED RESIDENTIAL DEVELOPMENT AT
PORTSDOWN HILL ROAD, HAVANT
ON BEHALF OF
BARRATT DAVID WILSON SOUTHAMPTON

FEBRUARY 2014

[ISSUE 2]

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DOCUMENT ISSUE RECORD

Client: Barratt David Wilson Southampton

Project: Proposed Residential Development at Portsdown Hill Road, Havant

Job Number: 4040

Document Title: Flood Risk Assessment

Issuing Office: Swindon

Issue / Revision:	Issue 1		Issue 2		
Description / Status:	Draft for Client Comment		Issued for Planning		
Date:	October 2013		February 2014		
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File Reference:	4040 - Portsdown Hill, Havant - FRA - Issue 1		4040 - Portsdown Hill, Havant - FRA - Issue 2		

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1.0 INTRODUCTION

1.1 This Flood Risk Assessment has been prepared by Cole Easdon Consultants (CEC) on behalf of Barratt David Wilson Southampton in respect of proposed residential development of land at Portsdown Hill Road, Bedhampton, Havant. Refer to CEC Figure 4040/500/Figure 1 [*Site Location Plan*] in Appendix 1.

Development Proposals

1.2 The development proposal is for 47 No. dwellings with associated access road, parking and landscaped areas. Vehicular access to the site will be from the existing road known as Bedhampton Hill, which terminates at the site's southern boundary. Refer to Drawing No. 10774 01 10 [*Masterplan*] by LHC Group in Appendix 6. This layout forms the basis of CEC Plan 4040/501 [*Proposed Drainage Strategy]* in Appendix 6.

Need for Study

1.3 The purpose of this assessment is to demonstrate to the Environment Agency (EA) that the proposals outlined above can be satisfactorily accommodated without worsening flood risk for the area, in accordance with the National Planning Policy Framework Document (NPPF).

1.4 Accordingly, this study has been prepared to:

i) Assess flood risk to the development from fluvial sources;

ii) Assess flood risk to the development from other potential sources, including ditches, sewers, groundwater and overland surface water flow;

iii) Ensure that the development proposed will fully comply with the requirements of the EA's policy on the safeguarding of floodplains; and

iii) Provide a SUDS surface water drainage strategy for the site.

1.5 A site topographical survey (referenced to Ordnance datum) has been provided to Cole Easdon Consultants and has been reviewed as part of this study. Refer to Drawing No. 4040/500 [*Existing Site Plan*] in Appendix 6.

Scope of Study

1.6 In Section 2.0, we describe the characteristics of the development site and surrounding area. In Section 3.0, we assess flood risk issues. Finally, conclusions are presented in Section 4.0.

1.7 The following resources have been used for this study:

- *Flood Zone Map – Environment Agency (EA)*
- *Groundwater Source Protection Zones Map - Environment Agency (EA)*
- *Geological Map - British Geological Survey (BGS)*
- *Ground Investigation Report – Wilson Bailey Geotechnical and Environmental*
- *Aquifer Data held by Portsmouth Water*

1.8 The following publicly available documents have also been reviewed as part of this assessment:

- *Partnership for Urban South Hampshire (PUSH) Strategic Flood Risk Assessment (SFRA), Final Report (Atkins, December 2007);*
- *National Planning Policy Framework (NPPF) (March 2012);*
- *Technical Guidance to the NPPF (March 2012);*
- *Sewers for Adoption, 7th Edition – A Design and Construction Guide for Developers (SFA 7) (March 2006);*
- *CIRIA C697 The SUDS Manual;*
- *Building Regulations 2010 – Approved Document H (Drainage and Waste Disposal).*

1.9 The following abbreviations are used in this report:

AOD – Above Ordnance Datum

EA – Environment Agency

SUDS – Sustainable Urban Drainage Systems

HA – Highway Authority

SAB – SUDS Adopting Body

FZM – Flood Zone Map prepared by the Environment Agency

NPPF – National Planning Policy Framework

LPA – Local Planning Authority

SW – Southern Water

1% event – 1 in 100 Year return period storm

1% + CC event – 1 in 100 Year return period storm including a 30% allowance for climate change.

2.0 THE EXISTING SITE

Refer to CEC Figure 4040/500/Figure 1 [*Site Location Plan*] in Appendix 1 and Plan 4040/500 [*Existing Site Plan*] in Appendix 6.

2.1 The site is located on the western edge of Bedhampton village, between Portsmouth and Havant. Bedhampton village centre is located some 0.8km to the east with Havant town centre 1.4km further east. The site is a roughly triangular parcel of land covering approximately 4.3 hectares and currently comprises open agricultural land with a number of sheds/stables in the north eastern corner of the site.

2.2 The site is bounded to the north by the rear gardens of housing on Portsdown Hill Road and to the east by the gardens of houses on Glebe Park Avenue and Bedhampton Hill. Bedhampton Hill and Havant Road (A2030) form the site's southern boundary, and grassed agricultural land lies at the site's western boundary.

2.3 The site is currently accessed from Bedhampton Hill/Havant Road.

2.4 Land use in the vicinity of the site is primarily residential.

2.5 The site slopes down from north to south at an average gradient of 1 in 10. Site levels vary from approximately 41.00m AOD (Above Ordnance Datum) within the north eastern region and 12.00m within the southern region.

Nearby Watercourses/Drainage Features

2.6 The tidal Langstone Harbour, an inlet of the English Channel, is located 0.6km to the south of the site. The Hermitage Stream is located 0.8km to the east and runs through Havant into the Langstone Harbour.

2.7 A small unnamed watercourse runs through the Bedhampton village and drains into the tidalHermitage Stream.

2.8 A spring fed drain issues approximately 500m south west of the site and passes under the A27 before discharging into Langstone Harbour. There are no watercourses within the site or in its immediate vicinity.

Existing Drainage/Sewers

2.9 Southern Water sewer records indicate the presence of public foul and surface water sewers serving the neighbouring properties. A 300mm diameter foul water sewer runs along the site's southern boundary to join a 200mm dia. foul sewer at Bedhampton Hill, which then flows south and then east along Havant Road. A 225mm dia. surface water sewer is located in Bedhampton Hill. It runs south and then west along Havant Road. Refer to public sewer records included within Appendix 4.

Existing Ground Conditions

2.10 The *British Geological Survey (BGS) Map* indicates the site to be underlain by chalk within the northern region. Head Deposits (clay, silt, sand and gravel) overlie chalk within the central and southern region. Refer to CEC Figure 4040/500/Figure 3 [*Geology Map*] in Appendix 1.

2.11 Site investigation works were undertaken by Wilson Bailey in August 2011. The works determined chalk beneath top soil to the full depth of investigation (5.0m below ground level) within the northern region. Across the rest of the site, the top soil layer is underlain by Head Deposits to depths between 1.20m and 3.45m (depth unproven). Head Deposits comprised primarily of silty sandy clay extending between 0.20 – 3.20m, silty/clayey Sand extending between 0.30 – 3.45m and sandy silt extending between 0.35 – 2.70m. Chalk occurred within the north-central region at depths of between 1.20m and 3.20m beneath Head Deposits.

2.12 No groundwater was encountered in any exploratory holes (5.0m depth maximum) during the site investigation works. Groundwater has been absent from the boreholes during subsequent groundwater monitoring visits. Refer to Appendix 2.

2.13 Falling head permeability tests undertaken at 3 No. boreholes determined soakage rates of 3.54×10^{-6} m/s and 7.24×10^{-6} m/s within Head Deposits and 1.14×10^{-4} m/s within the chalk strata. These results demonstrate that the strata at the site have 'good' to 'reasonable' infiltration potential. Soil tests carried out indicated that concentrations of potential contaminants remained within the permissible threshold for residential end use proposed for the site. Refer to Appendix 2.

2.14 The EA classifies the chalk beneath the area as a 'Principal' Aquifer and the Head Deposits as 'Secondary Undifferentiated'. The EA's Groundwater Source Protection Zone Map confirms that the site does not lie within a Source Protection Zone. The 'Inner Protection Zone' is associated with Havant Springs Abstraction Point, which supplies potable water to the locality, is located to the north and east of the site.

2.15 The existing topography of the locality is such that the site lies downstream of the catchment which supplies the abstraction works. This has been confirmed by Portsmouth Water. Refer to correspondence within Appendix 5.

3.0 FLOOD RISK ISSUES

Flood History

3.1 The PUSH SFRA maps indicate historical flooding in Bedhampton village centre, and several sewer flooding incidents across the village. No historical groundwater flooding has been recorded in the area. The SFRA does not identify any historical flooding incidents within the vicinity of the site.

Fluvial/Tidal Flood Risk

3.2 The Environment Agency's Flood Zone Map indicates that the site lies within Flood Zone 1 (low risk) with less than a 1 in 1000 (0.1%) annual probability of fluvial or tidal flooding in any year. Refer to CEC Figure 4040/500/Figure 2 [*Flood Zone Map*] in Appendix 1.

3.3 *Technical Guidance to the NPPF (Table 2: Flood Risk Vulnerability Classification)* classifies the proposed site usage 'residential' as 'more vulnerable' development. In accordance with the *Technical Guidance to the NPPF (Table 3: Flood Risk Vulnerability and Flood Zone Compatibility),* such developments are suitable in Flood Zones 1 and 2.

3.4 Fluvial/tidal flood risk to the site is therefore low.

Overland Runoff

3.5 The site is located on a sloping hillside, with the land to the north rising towards Portsdown Hill Road which runs along the ridge line. Notwithstanding this, owing to the permeable chalk geology in the north of the site and the mainly undeveloped garden land use upslope of the site, any overland flows will be negligible. Should such overland runoff enter the site, it would flow across the site following the sloping topography, and would not accumulate and cause flooding.

3.6 Flood risk from overland flows is therefore low.

Sewer Flooding

3.7 It is likely that sewers/highway drains are located beneath Portsdown Hill Road, to the north of the site. Should these sewers flood, floodwaters would be contained within the highway corridor, and flow in an easterly direction, then flow south along Glebe Park Avenue to the east of the site. Such flows would not affect the site. The existing sewers

located in Bedhapton Hill/Havant Road, are located at a lower level than the land within the site and therefore do not represent a risk of flooding.

3.8 The risk of flooding from existing sewers is low.

Groundwater Flooding

3.9 Groundwater was not recorded during the site investigation which included boreholes to 5m depth, nor during subsequent groundwater monitoring. The permeable geology of the area and the steep site topography suggest that the groundwater table lies at significant depth below the surface. Refer to Appendix 2.

3.10 The risk of groundwater flooding is low.

4.0 PROPOSED DRAINAGE STRATEGY

Surface Water

Refer to CEC Plan 4040/501 [*Proposed Drainage Strategy*] in Appendix 6.

4.1 With the exception of the small sheds in the north east of the site, the existing site surfacing is permeable greenfield land. Under the development proposals, some 1.4ha of surfacing will be introduced in the form of roads, parking areas and roofs. Without appropriate management, runoff from this catchment could increase flood risk to the locality.

4.1 It is therefore proposed that the site is drained at source by means of infiltration based Sustainable Urban Drainage Systems (SUDS). Disposal of post development runoff at source will ensure that the development does not increase flows to any receiving watercourse or sewer, and hence will not increase flood risk to the site or the locality.

4.2 The site geology includes Chalk near the surface within the northern and northern central region and Head Deposits above Chalk within the southern region. Soakage tests undertaken have determined soakage rates of between 3.54 x 10^{-6} and 7.24 x 10^{-6} m/s within Head Deposits and 1.14 x 10-4 m/s within chalk. As such, infiltration SUDS will operate effectively. The tests were undertaken within small boreholes at limited locations, and further tests (in accordance with the standard BRE Digest 365 method) may be needed at the detailed design stage. Refer to Appendix 2 for borehole logs and infiltration test results.

4.3 The site will be drained as follows:

Spine Road Catchment (Area 0.26ha)

4.4 This catchment comprises the central site access road which is orientated north – south through the site.

4.5 Runoff from this relatively small catchment will be drained by a highway drain which will discharge to 3 No. shallow cellular soakaway SUDS facilities (formed using Aquacell units or similar) which will be located in the open space areas located throughout the site. The soakaways will be sized to accommodate flows from the 1% + cc storm event in accordance with NPPF requirements. Due to the steep gradient of the site double large capacity gullies will be utilised throughout the catchment in order to ensure that runoff does not escape the site and enter Bedhampton Hill. Preliminary design calculations indicate that the soakaway facilities will vary from 100m2x0.4m effective depth to 165m2x0.4m affective depth, as shown on CEC Plan 4040/501 [*Proposed Drainage Strategy*] in Appendix 6.

Roof Catchment (0.56ha)

4.6 Surface water runoff from roofs will be discharged to private ring or trench soakaways located in back gardens. A 5m buffer zone will be maintained between sokaways and any building foundation in order to prevent damage/erosion which could be caused by water ingress. All private soakaways will be designed to accommodate the 1%+cc storm event.

Private Drives and Parking Areas (0.55ha)

4.7 Permeable paving will be installed throughout private drives and parking areas allowing drainage of these areas at source. Where necessary, roof water from houses and garages may also be piped into the permeable paving base. Due to the steep gradient gullies and linear drains will be installed within low spots and at building thresholds to ensure that all runoff is captured and directed into the paving base. All permeable pavements will be designed to accommodate the 1%+cc storm event. Initial modelling confirms that a effective depth of 0.5m will be required throughout the permeable pavement areas.

4.10 All calculations have been undertaken using Windes Microdrainage software. Refer to Appendix 3.

Adoption

4.11 All SUDS and drainage infrastructure will be managed privately under the overall private management regime for highways and open spaces at the site.

Water Quality

4.12 The chalk aquifer beneath the area is considered a 'Principal' Aquifer and is vulnerable to pollution. Notwithstanding this, groundwater lies at a considerable depth below the site; groundwater was not detected during the site investigation or during subsequent water monitoring visits. In addition to the treatment measures described below, the thick buffer of strata between the proposed SUDS features and the water table will provide effective water quality treatment.

4.13 Note that the site does not lie within a Source Protection Zone as defined by the EA's maps. Furthermore, Portsmouth Water, the authority responsible for abstraction of potable water from the chalk aquifer, has confirmed that due to the sites location and the inclusion of the proposed SUDS measures, the proposed development will not impact on groundwater resources. Refer to Appendix 5 for correspondence.

4.14 Due to the possibility of fuel and oil leaks/spillages, the proposed parking areas and driveways represent the most likely source of contaminated runoff. These areas will be surfaced with permeable paving which has excellent pollutant removal capabilities, as acknowledged by the CIRIA SUDS Manual (2007).

4.15 Storm water runoff from roof catchments is uncontaminated, and does not warrant complex treatment process. As such, soakaways are appropriate for disposal of runoff from this catchment.

4.16 Runoff from the small spine road catchment may contain some particulates and hydrocarbons. Water quality treatment for this catchment will be provided by trap gullies and by filtration through the strata surrounding the proposed highway soakaways. This is a relatively small catchment and as such more onerous treatment measures are not necessary.

Design Exceedence

4.17 The topography of the site is such that flows generated by design exceedence or failure of the proposed SUDS facilities could result in overland flows to the south. Any exceedence flows are likely to be absorbed by the extensive garden areas and large open spaces located throughout the site which are underlain by permeable sub soils.

Justification of SUDS Strategy

4.18 The steep topography of the site makes open SUDS features such as ponds and infiltration basins impractical; the earthworks associated with creating these facilities on a steep slope would sterilise a significant proportion of the site area. Furthermore, storing large volumes of water above residential development is an unnecessary flood risk which can be avoided by using below ground systems.

4.19 The site offers the potential for all runoff generated by the development to be disposed of at source via soakaways, without impact on the existing drainage regime, and hence without increasing flood risk to the locality.

4.20 Soakaways and permeable pavements are recognised by the CIRIA SUDS Manual (2007) as Sustainable Urban Drainage Systems.

4.21 All SuDS have been designed to accommodate runoff generated by the 1:100 year storm, including a 30% allowance for climate change, in accordance with NPPF guidance.

Foul Water

4.22 The site will generate a peak foul flow of approximately 2.16 l/s based on 47 No. units at a rate of 4,000 litres/unit dwelling/day in accordance with *Sewers for Adoption*.

4.23 A Southern Water 225/300 mm dia. foul water sewer runs adjacent to the site's southern boundary. It is proposed that the site discharge into this existing foul water sewer via a new manhole. Refer to CEC Plan 4040/501 [*Proposed Drainage Strategy*] in Appendix 6.

4.24 A Level 1 Capacity Check carried out by Southern Water in October 2013 has determined that there is insufficient capacity within the existing foul system to accommodate the predicted flows from the development.

4.25 A level 2 Capacity Check has since been undertaken and has identified Budds Farm Sewage Works, located 1.4km south west of the site, as the nearest point where foul capacity is available. Making a new connection to this point by requisition through 3rd party land is impractical due to the existing railway line, A27 highway and A3 (M) Motorway. The Capacity Check report therefore provides details of the off site improvement works

required to provide capacity for the development which comprise some 500m linear metres of sewer upgrades. Refer to Appendix 5 for Southern Water correspondence.

5.0 SUMMARY AND CONCLUSIONS

5.1 Flood risk to the proposed development from fluvial sources, overland flow, sewers and groundwater has been considered in this study. No significant risks have been identified.

5.2 The site lies within Flood Zone 1 (Low Risk) according to the FZM produced by the EA. As such, in accordance with NPPF guidance, redevelopment of the site for residential purposes is appropriate.

5.3 Surface water discharge from the site is therefore the primary flood risk associated with the proposals. This risk will be managed by introduction of infiltration based Sustainable Urban Drainage Systems (SUDS) including permeable paving, cellular infiltration systems and soakaways. The use of SUDS will ensure that runoff from the 1%+cc event is retained on site in accordance with NPPF requirements. The proposed infiltration based SUDS will allow disposal of post development runoff on site, at source, with no impact upon the existing drainage system and hence no impact on flood risk to the locality.

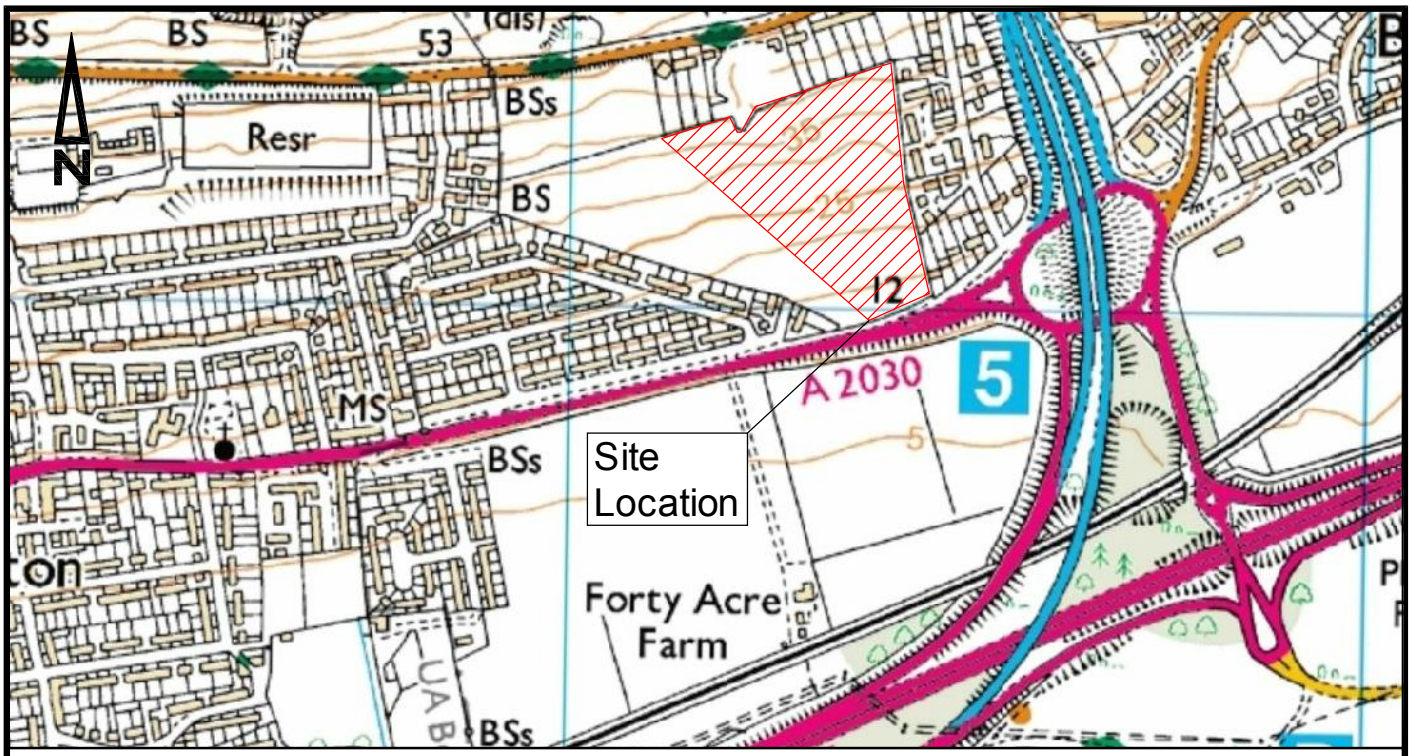
5.4 The chalk aquifer beneath the area is considered a 'Principal' Aquifer and as such any infiltration SUDS considered for the runoff from highway areas will provide suitable water quality management. Portsmouth Water has confirmed that due to the location of the site and the abovementioned SUDS measures the impact of the proposals up[on water quality will be negligible.

5.5 Subject to approval by Southern Water, foul flows will be discharged to the existing foul sewer in the verge of Havant Rd/Bedhampton Hill, and the off site reinforcements identified by Southern Water will be undertaken with a contribution from the developer.

5.6 This study has been undertaken in accordance with the principles of the NPPF document. We conclude that providing the development adheres to the conditions advised within this report, the proposals can be accommodated without increasing flood risk within the locality in accordance with objectives set by Central Government and the EA.

Cole Easdon Consultants Limited
February 2014

Appendix 1



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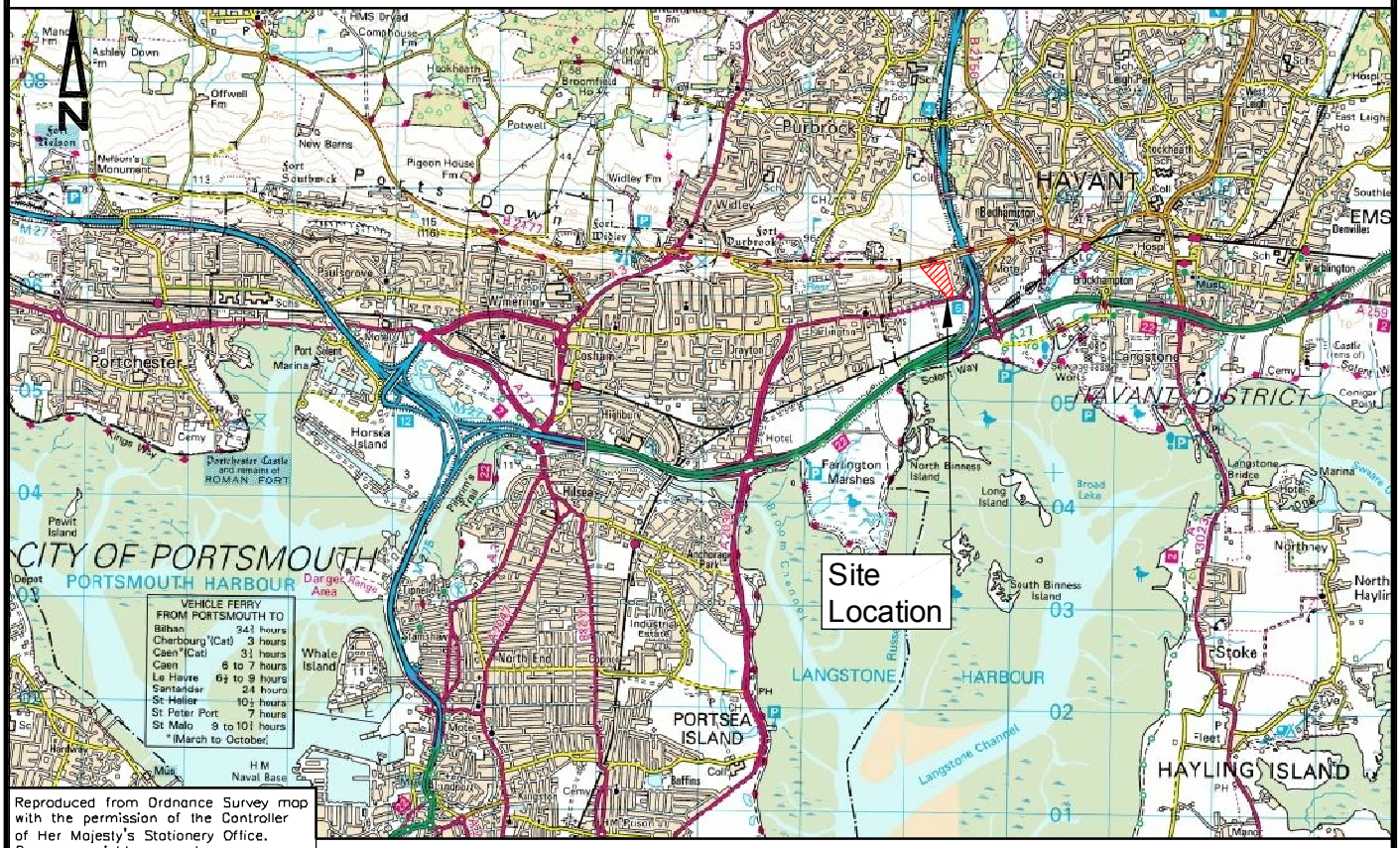

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Job Title:	Client:		
Portsdown Hill Havant Hampshire	Barratt David Wilson Homes Southampton		
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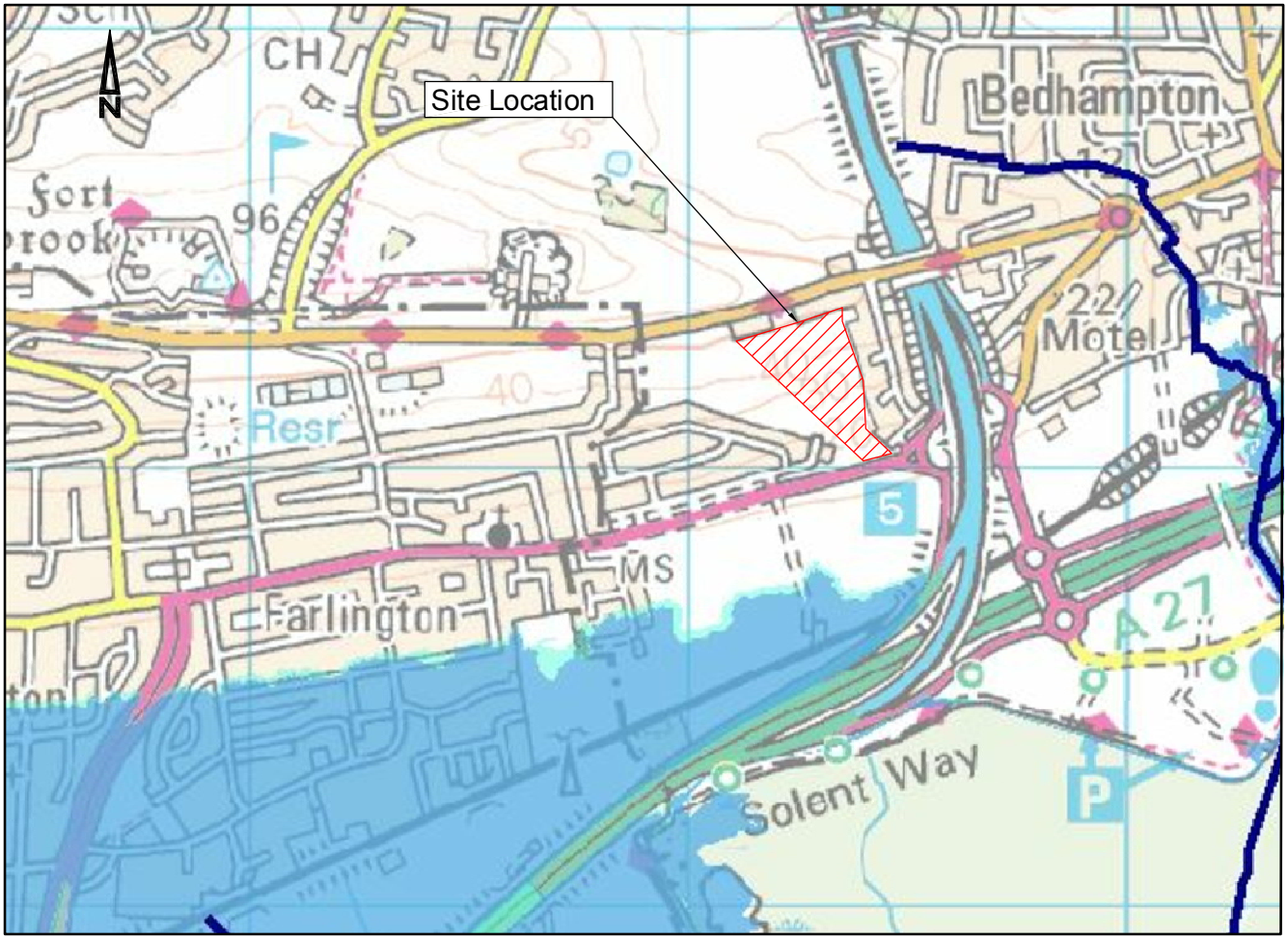

Flood Zone 1
- Low Risk

Flood Zone 2
- Medium Risk

Flood Zone 3
- High Risk

Main Rivers

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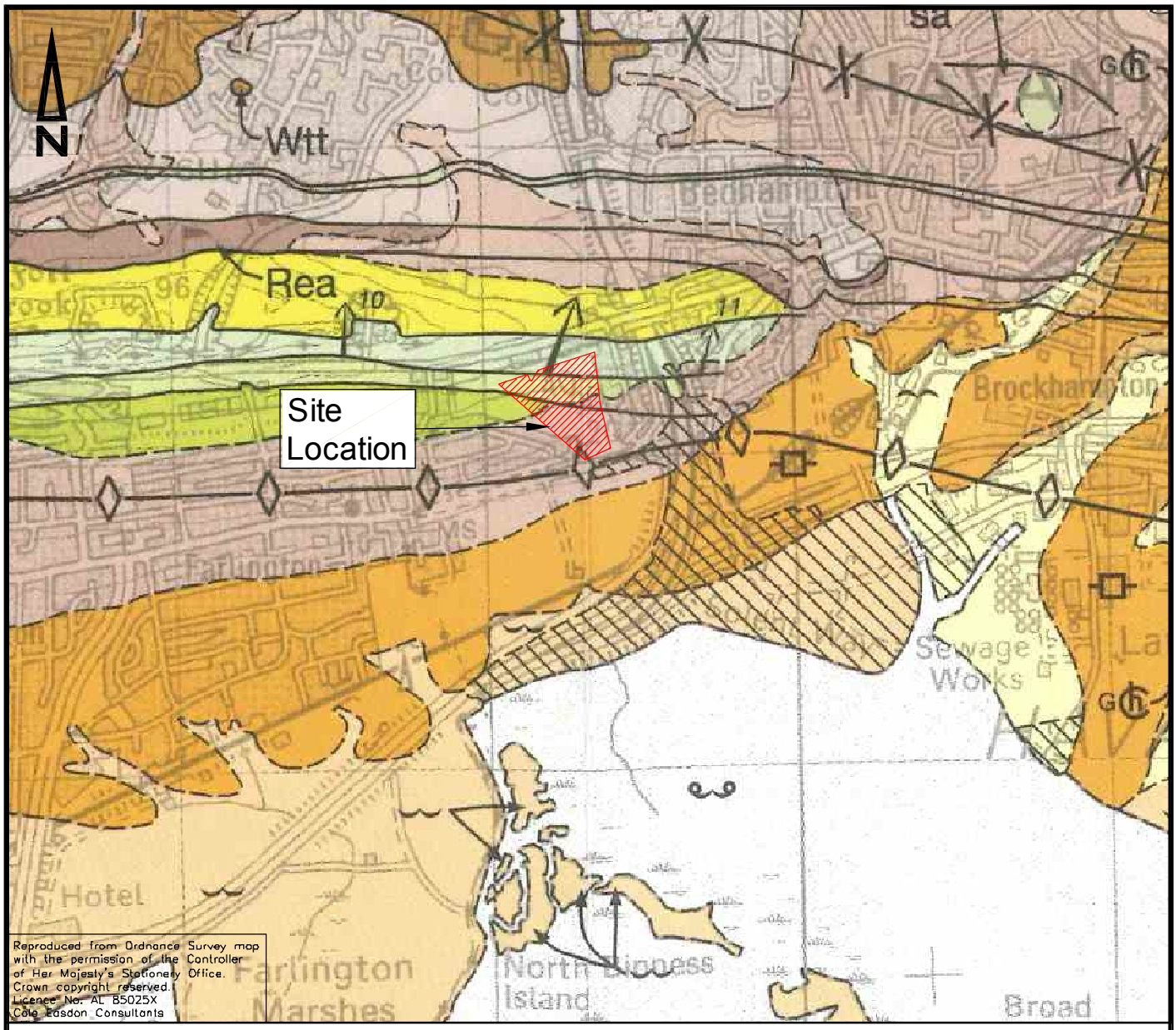

KEY

Spetisbury Chalk Member

Tarrant Chalk Member

Newhaven Chalk Member

Head deposits

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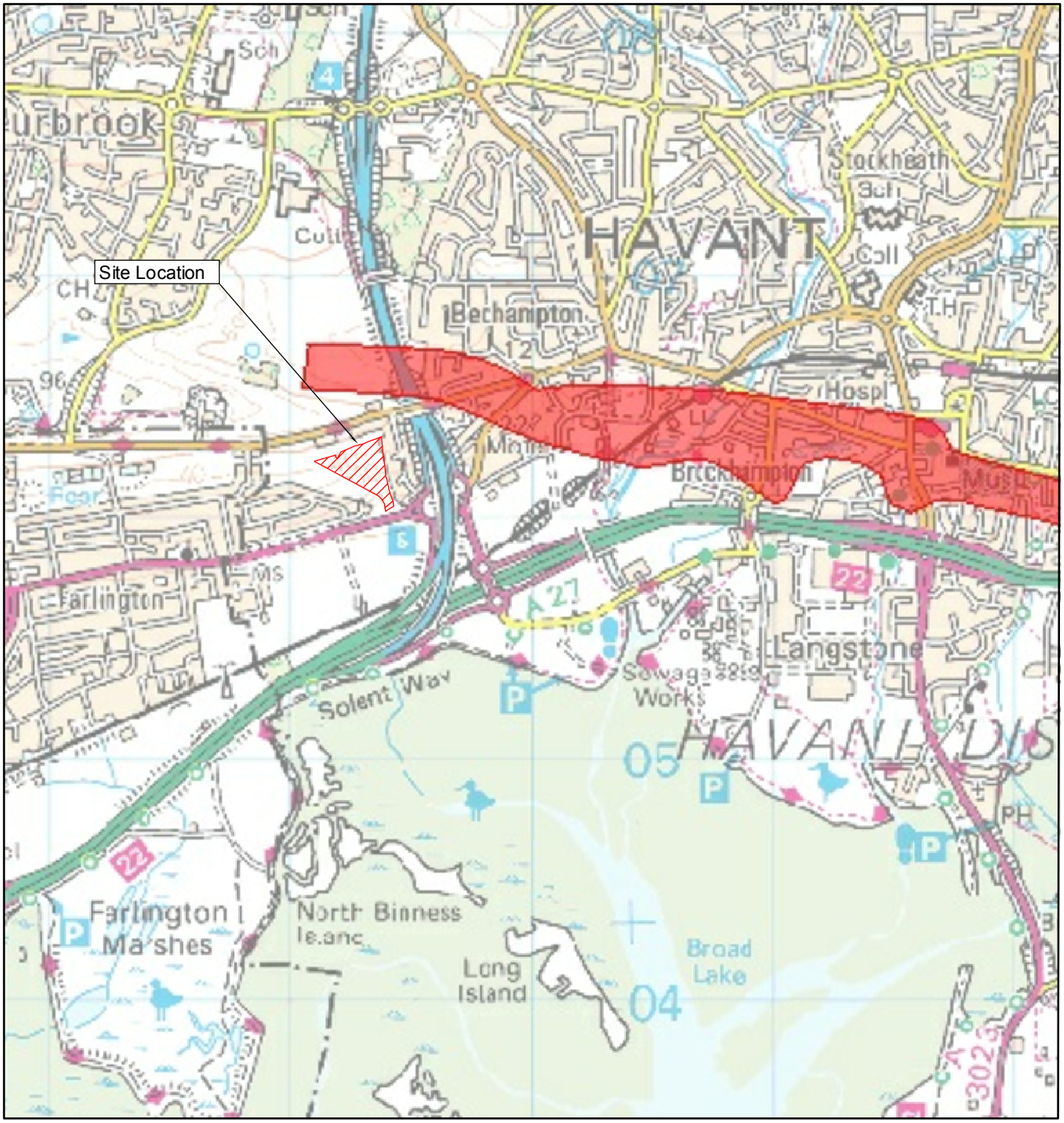

Inner Groundwater Protection Zone

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Job Title:	Client:		
Portsdown Hill Road Bedhampton Havant	Barratt David Wilson Homes Southampton		
Drawing Title:	Drawn By	Date Drawn	Scale
Groundwater Protection Zones	HP	25.09.2013	1:25,000 @ A4
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		4040/500/Figure 4	

Appendix 2

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Forge Farmyard
Compton Chamberlayne
Salisbury, Wiltshire
SP3 5DS
Tel: 01722 714549

23 September 2011

Your ref:
Planning ref:
Our ref: J11144/DB/c02

Ms K Child
Barratt David Wilson Southampton
Tollbar House
Tollbar Way
Hedge End
Southampton
Hampshire
SO30 2UH

Dear Ms Child,

RE: PORTSDOWN HILL SITE, HAVANT, HAMSPHIRE

DESK STUDY & GROUND INVESTIGATION LETTER REPORT FOR THE PROPOSED RESIDENTIAL REDEVELOPMENT

Further to instruction from BDW Southampton, we have carried out desk study research and subsequently attended the above site and carried out a walkover survey and ground investigation to provide information to assist with the redevelopment of the site through the construction of 80 new houses, together with driveways, access roads, hardstanding for car parking, soft landscaping and areas of private domestic gardens.

The comments made in this letter are limited to those that can be made on the basis of the information obtained by Wilson Bailey Partnership as part of the limited research and site walkover visit carried out to date. Our comments should be viewed in the context of the limited scope of the investigation, the locations of the accessible sampling points and the range of data sources consulted, no liability can be accepted for information in other data sources. Any comments made on the basis of information obtained from the client or other third parties are given in good faith on the assumption that the information is accurate; no independent validation of such information has been made by Wilson Bailey Partnership.

Scope of Work

A desk study has been carried out in accordance with current guidelines for best practice to establish the environmental site setting and development history of the site and the surrounding area.

The desk study has been followed by a pre-purchase ground investigation to provide information to assist with the design of new foundations, pavements, soakaways and facilitate the inspection of soils and recovery of soil samples for contaminated land assessment.

The ground investigation has been carried out in a single phase and comprised a series of 6 small diameter boreholes drilled by means of an open drive percussive soil sampling rig to a depth of up to 5.45 m together with a series of 17 trial pits excavated using a rubber tyred mechanical excavator. Combined soil gas and groundwater monitoring standpipes have been installed into a number of the boreholes located across the site to facilitate future monitoring. Falling head borehole percolation testing has been carried out in a number of the boreholes to assess the potential for soil soakage and the viability of soakaways as part of the proposed redevelopment. A return visit to monitor the depth to ground water and the presence of soil gasses across the site has not been carried out to date.

The soils encountered in the boreholes were inspected by a Chartered Geologist and representative soil samples were recovered for subsequent laboratory testing for geotechnical properties and for contaminated land soil analyses to determine the presence of a wide range of potential soil contaminants. The scope of the ground investigation was limited by the continued use of the eastern part of the site as grazing for horses, which precluded the excavation of trial pits within this part of the site.

In accordance with current best practice, the findings of the desk study and ground investigation have been used to formulate a conceptual model for the site and facilitate a preliminary qualitative risk assessment and discussion of the implications of any identified issue of potential concerns with regards to ground contamination. On the basis of this assessment, the requirement for any further assessment or remedial action as part the redevelopment of this site for residential purposes has been determined.

Site Description

The site is roughly triangular in shape with approximate maximum dimensions 190 m by 350 m. The main western and southern parts of the site are currently occupied by open agricultural land, whilst the northeastern part of the site comprises a series of heavily grazed paddocks together with a number of stable buildings for horses, sheds, associated feed stores and various caravans, boats and dilapidated trailers.

The northern and eastern boundaries to the site are marked by various hedges and fences that form the extent of rear gardens to adjoining properties fronting onto Firlands Rise and Spinnaker View to the east and Portsdown Hill Road to the north. The southern boundary to the site is formed by a section of mature hedgerow together with a steel five bar gate that provides access to the site from Bedhampton Hill to the south. The western boundary to the site is not clearly defined and forms a notional site boundary line through the agricultural fields that extend westwards towards further houses approximately 200 m to the west of the site.

The site slopes downwards to the south and southeast with an overall variation in site level of approximately 28 m, which corresponds with an overall site gradient of approximately 1:10, which is consistent with the variation of the surrounding topography. The northeastern corner of the site is however sensibly levelled with a noticeable break in slope within the middle portion of the paddock area, which has a localised slope gradient of approaching 1:7.

As part of the walkover survey no indications of the storage or use of chemicals was noted, with no indications of distressed vegetation noted.

The site may be additionally located using National Grid Reference 469354,106186.

Site History

The history of the site and immediate surrounding area has been researched by reference to publically available historical Ordnance Survey (OS) maps together with supplementary information inspected at the Havant Local Studies Library.

The earliest map studied, dated 1868, indicates the site to have been occupied by open fields within a predominantly rural setting with a number of chalk pits shown to have been located in the vicinity of the site to the north, including one quarry immediately adjacent to the northern boundary of the site. Subsequent historical maps dating to the present day indicate that the site has remained essentially unchanged, although the former open agricultural land to the north and east is shown to have been gradually developed for housing.

The various chalk pits shown on the historical maps are predominantly shown to have remained disused and open to the present day, although one of the larger chalk pits located approximately 150 m to the east of the site is shown to have been redeveloped through the construction of the A3(M) in the early 1970s together with the subsequent construction of a substantial portal frame commercial building, although the variation of topography at that site indicates that the former chalk pit has been reused rather than filled prior to redevelopment.

Environmental Site Setting
Information provided by the British Geological Survey indicates the northwestern part of the site to be underlain by the Tarrant Member of the Upper Chalk Formation, with the remainder of the site shown to be underlain by Head Deposits overlying the Newhaven Member of the Upper Chalk Formation.

Information provided by the Environment Agency indicates the chalk strata to be classified as a Principal Bedrock Aquifer, with the overlying Head Deposit classified as a Secondary (undifferentiated) Superficial Aquifer. The site is not shown to be located within any class of Source Protection Zone associated with any licensed groundwater abstraction points, although the Inner Source Protection Zone associated with the Portsmouth Water Havant Springs abstraction points are shown to be located approximately 150 m to the north of the site.

Further information provided by the Environment Agency does not indicate the presence of any active or historical landfill sites or other indications of any other potentially contaminative land uses such as waste processing sites, fuel filling stations or pollution incidents have been recorded within 500 m of the site. The Harts Farm Landfill site is however shown to be located approximately 600 m to the southeast of the site and is understood to have been licensed for the placement of household wastes prior to closure of the landfill.

Information provided by the Health Protection Agency indicates the site to be located in an area where less than 1% of houses are above the action level for radon emissions, such that radon protective measures should not be required as part of the construction of new buildings.

Preliminary Conceptual Site Model Summary and Risk Assessment
The historical and current use of the site for open agriculture and as grazing for horses is not considered to present a potentially contaminative history. Whilst there have been a number of historical chalk pits in the vicinity of the site, these are all indicated to have remained open and unfilled to the present day. A single closed historical household waste landfill site however is shown to be located approximately 600 m to the southeast of the site.

Ground Conditions
Across the northeastern part of the site, beneath the initial nominal layer of topsoil, a natural weathered profile of chalk was encountered to the full depth of investigation in this part of the site. Across the remainder of the site the topsoil layer has been found to be underlain by an initial silty sandy clay with occasional and locally abundant flint gravel to depths of between 1.40 m and 2.50 m below ground level. Underlying the initial clay layer, a variable chalk derived silt and sand with variable flint gravel and cobbles was encountered to the maximum depth of 2.80 m below ground level within the majority of the exploratory positions.

Within the northwestern part of the site these chalk derived silt and sand Head Deposits have been proved to be underlain by a natural weathered profile of chalk at depths of between 1.30 m and 1.90m. Where proved in the deeper small diameter boreholes within the southern part of the site, the underlying chalk strata has been encountered at a depth of 3.20 m below ground level

The results of laboratory index testing carried out on selected soil samples indicates the near surface clay soils to be of low to medium plasticity.

Groundwater was not encountered as part of this ground investigation. Whilst combined soil gas and groundwater monitoring standpipes have been installed in a number of the boreholes, return visits for soil gas and groundwater monitoring have not been carried out to date.

No visual or olfactory indications of ground contamination were noted as part of the fieldwork phase of the ground investigation.

Foundation Design Advice

Within the northeastern part of the site where chalk has been encountered beneath the initial topsoil layer, and within parts of the northwestern part of the site where chalk has been encountered at depths of less than about 2.00 m, moderate width pad or strip foundations may be designed to found within the natural weathered profile of chalk strata at a minimum depth of 1.00 m below ground level with a minimum foundation width of 0.60 m and apply a net allowable bearing pressure of 200 kN/m^2.

Within the southern and central parts of the site, where predominantly clay Head Deposits have been encountered, foundations may need to be locally deepened and designed to apply a reduced net allowable bearing pressure of 75 kN/m^2 at a minimum depth of 1.00 m below ground level.

Whilst the approximate extent of the site that is potentially affected by clay soils is indicated on the enclosed annotated site plan, it may be prudent to carry out further ground investigation by trial pitting once access is available, to further delineate the change in ground conditions. Alternatively it may be prudent to have foundation excavations in this part of the site inspected by a suitably qualified and experienced engineer.

Foundations within the clay soils present within the southeastern part of the site will need to be deepened in the vicinity of existing and proposed trees and National House Building Council (NHBC) guidelines should be followed in this respect; medium shrinkability clays should be assumed where clay soils are present.

Where trees are to be removed the required founding depth should be determined on the basis of the existing tree height if it is less than 50% of the mature height and on the basis of full mature height if the current height is more than 50% of the mature height. Where a tree is to be retained the final mature height should be adopted and due allowance should be made for future growth of trees, with particular reference to the relatively dense additional planting that is proposed as part of the ecological mitigation measures. Notwithstanding NHBC guidelines, all foundations should extend beyond the zone of desiccation; in this respect it would be prudent to have all foundation excavations inspected by a suitably experienced engineer. The requirement for compressible material alongside foundations should be determined by reference to the NHBC guidelines.

Consideration could be given to the use of alternative foundation such as 'Insulslab' or other proprietary waffle raft foundation solutions at this site, although the sloping site topography may render their use uneconomic. Further investigation, testing and discussion may however be required in order for the use of alternative foundation solutions to be sanctioned by the NHBC at this site.

Excavations

Shallow excavations for services and foundations within the near surface soils are likely to remain dry and broadly stable in the short term. Groundwater is unlikely to be encountered within shallow excavations for foundations and services. Where personnel are required to enter excavations, a risk assessment should be carried out and temporary lateral support or battering of the excavation sides considered in order to comply with normal safety requirements.

Slope Stability
A detailed assessment of the slope stability at this site is outside the scope of this pre-purchase report and will be heavily dependent upon the requirement for any retaining walls and slope regarding likely to be associated with the proposed redevelopment such that further review may be required in due course once the layout and detailed levels of the proposed development have been determined. The site walkover has not indicated the presence of any instigations of historical slope instability of slope movements at this site.

Ground Floor Slabs
Whilst ground bearing floor slabs could be considered across the northeastern part of the site where chalk soils have been encountered at shallow depth, across the majority of the site where near surface medium shrinkability clay soils have been encountered, proposed new buildings should be designed to incorporate suspended ground floor slabs over a void in accordance with NHBC guidelines.

Pavement Design
Depending upon the finalised design of the development and the proposed ground levels, the formation level for hardstandings and access roads across the majority of the site is likely to be within the near surface clay soils such that pavements may be designed on the basis of an assumed California Bearing Ratio (CBR) of "about 2%". Insitu CBR testing may be of assistance in the detailed design of new pavements.

Within the northeastern part of the site, where formation levels are likely to be within chalk strata, these soils are to be regarded as frost susceptible and a minimum pavement thickness of 450mm is likely to be required

Surface Water Drainage
The results of the borehole falling head percolation testing may be used to provide a preliminary assessment of likely soil soakage, although full size trial pit soakage testing may be required in due course, to provide detailed design data, particularly if adoptable highways drainage is required. The results of the falling head testing are enclosed and indicate assessed soil infiltration rates of 4 E-6 m/s and 7 E-6 m/s may be expected within the Head Deposits of the southern part of the site, whilst soakage rates of up to 1 E-4 may be expected within the chalk strata present in the northeastern part of the site.

Shallow soakaways may therefore be expected to be viable at this site, although discussions should be held with the local Environment Agency office with regards to the proximity of the Inner Protection Zone of the Havant Springs abstraction point which is operated by Portsmouth Water for the supply of drinking water to Portsmouth.

Effect of Sulphates
Chemical analyses of selected soil samples have revealed generally low concentrations of soluble sulphate, corresponding to Class DS-1 AC-1 of Table 2 of BRE Special Digest 1: SD1 Part 1 (August 2001). The guidelines contained in the above digest should be followed in the design of foundation concrete.

Potable Water Supply
The requirement for protection of underground sections of potable water supplies will need to be confirmed through discussions with the proposed statutory provider of mains water to the site, although precautions are not likely to be required for the development at this site.

Soil Contamination Test Results
Part IIA of the Environmental Protection Act 1990, which was inserted into that Act by Section 57 of the Environment Act 1995, provides the main regulatory regime for the identification and remediation

of contaminated land. The determination of contaminated sites is based on a "suitable for use" approach which involves managing the risks posed by contaminated land by making risk-based decisions. This risk assessment is carried out on the basis of a source-pathway-receptor approach.
The results of comprehensive laboratory analyses carried out by an MCERTS accredited laboratory on a limited number of soil samples recovered from this site are enclosed. At the time of reporting only a relatively limited selection of Soil Guideline Values have been released following the withdrawal of the previous guidance. The significance of the measured concentrations of any chemicals of concern has therefore been assessed in relation to the available SGVs together with the revised and updated values that have been adopted by the Chartered Institute of Environmental Health (CIEH)[1]. Whilst the values that have been adopted by the CIEH are not statutory, they are widely accepted as providing a suitable initial screening value against which measured concentrations of potential contaminants can be assessed to determine the requirement for site specific quantitative risk assessment.

From a review of the enclosed results it is apparent that elevated concentrations of a wide range of potential soil contaminants have not been detected within the selected representative soil samples submitted to laboratory analyses.

Contaminated Land Discussion
The historical and current use of the site as open agricultural land and grazing is not considered to present a potentially contaminative history or current use and the walkover survey has not revealed any signs of storage or use of potentially contaminative chemicals and no indications of distressed vegetation were noted.

The historic landfill site located approximately 600 m to the south of the site is not considered to pose a significant risk to this site by virtue of distance and the presence of significant infrastructure features including road and rail cuttings that are likely to mitigate the potential for any potentially mobile soils gasses or contaminants to affect this site.

The ground investigation carried out to date has not indicated the presence of elevated concentrations of a wide range of potential contaminants, and whilst unlikely, it is conceivable that localised pockets of contamination could be present. It is therefore considered that the ground works for the proposed redevelopment at this site should be carried out under a geo-environmental watching brief in order that should any suspicious or contaminated soils be encountered, they can be appropriately investigated by a geo-environmental engineer and appropriately dealt with in consultation with the regulatory authorities.

Site workers should be made aware of the site history and the potential for contamination to be present and a programme of working should be identified to protect workers handling any soil. The method of site working should be in accordance with guidelines set out by HSE[2] and CIRIA[3] and the requirements of the Local Authority Environmental Health Officer (EHO).

Further work
It may be prudent to carry out a limited programme of soil gas monitoring in order to determine the requirement for gas protection measures.

Consideration could also be given to carrying out a further phase of trial pit investigation, once access is available, within the southeastern part of the site in order to more fully delineate the boundary between predominantly clay and sand soils within this part of the site. Whilst this information is not

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1 *The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition) July 2009.*

2 *HSE (1992) HS(G)66 Protection of workers and the general public during the development of contaminated land HMSO*

3 *CIRIA (1996) A guide for safe working on contaminated site Report 132, Construction Industry Research & Information Association*

considered necessary for the contaminated land assessment, it would be important to assist with the detailed design of foundations once the proposed development layout and levels have been finalised.

Further consideration of the implications of any slope stability issues will need to be given once the detailed design and levels of the proposed redevelopment have been finalised.

We trust that this letter provides sufficient information although please do not hesitate to contact me should you have any queries or questions.

Yours sincerely
Wilson Bailey Partnership

Dominic Brightman
BSc MSc DIC FGS CGeol ARSM
Principal Engineer

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GEOTECHNICAL & ENVIRONMENTAL

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Trialpit No
TP1
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.50m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D					TOPSOIL
			0.30			Firm orange-brown silty sandy CLAY with fine to medium flint gravel
0.50	D		0.50			Firm pale brown CLAY with abundant chalk fragments and occasional fine to medium flint gravel and cobbles
1.00	D					
2.00	D					
			2.50			Trialpit Complete at 2.50 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Groundwater not encountered

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP2
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.50m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.25	D					TOPSOIL
			0.35			Firm orange-brown silty CLAY with abundant flint and occasional chalk
0.50	D					
1.00	D		1.00			Pale brown off white clayey SILT with abundant chalk fragments and flint with fine to medium gravel and cobbles
2.00	D					
			2.50			Trialpit Complete at 2.50 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Groundwater not encountered.

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Trialpit No
TP3
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.70m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D		0.30			TOPSOIL
0.50	D		0.80			Firm reddish orange-brown silty sandy CLAY with occasional flint and gravel
1.00	D					Pale brown off-white SILT with abundant fine chalk and flint fragments and cobbles
2.00	D		2.70			Trialpit Complete at 2.70 m

Remarks: Trial pit excavated using a rubber tyred excavatoe (JCB ecx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Groundwater not encountered.

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Trialpit No
TP4
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.70m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.25	D		0.30			TOPSOIL
0.50	D					Firm reddish orange-brown silty CLAY with occasional flint and fine gravel
0.90	D		1.00			
1.10	D					Pale brown off white sandy SILT with abundant fine chalk and abundant cobbles
			2.70			Trialpit Complete at 2.70 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Groundwater not encountered.

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Trialpit No
TP5
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.50m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.30	D		0.35			TOPSOIL
0.50	D					Firm reddish orange-brown CLAY with abundant fine gravel with occasional cobbles
1.00	IVN 1	80				
1.00	IVN 2	110				
1.00	IVN 3	100				
1.00	D		1.40			Pale brown very sandy silty CLAY with abundant fine chalk and flint gravel and cobbles.
2.00	D					
			2.50			Trialpit Complete at 2.50 m

Remarks: Trial pit excavated using a tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Groundwater not encountered.

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HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP6
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.70m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D					TOPSOIL
			0.35			Firm reddish orange-brown SILT
1.00	D					
			1.60			Pale brown clayey sandy SILT
2.00	D					
			2.70			Trialpit Complete at 2.70 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucjet. Trial pit sides stable.

Groundwater: Ground water not ecountered.

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Trialpit No
TP7
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.80m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.30	D					TOPSOIL
			0.40			Firm reddish orange-brown silty CLAY with gravel and occasional cobbles
1.00	D					
			1.80			Pale brown silty clayey locally yellow SAND
2.00	D					
			2.80			Trialpit Complete at 2.80 m

Remarks: Tria pit exvavated using a rubber tyre excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

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Trialpit No
TP8
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.60m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
						TOPSOIL
0.20	D		0.20			
						Firm dark orange-brown silty sandy CLAY with flint and gravel
0.50	D					
			0.80			
						Pale brown silty SAND with fine chalk fragments and abundant fine flint gravel and occasional cobbles
1.00	D					
2.00	D					
			2.60			
						Trialpit Complete at 2.60 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

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HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP9
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.50m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D		0.30			TOPSOIL
			1.40			Structureless CHALK comprising a white comminuted chalk matrix with scattered fine gravel of white weak low density chalk fragments (Grade Dm)
1.50	D		2.50			Structureless CHALK comprising a fine to medium gravel of white weak low density chalk fragments with a white comminuted chalk matrix (Grade Dc)
2.00	D					Trialpit Complete at 2.50 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP10
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.50m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D					TOPSOIL
			0.30			Firm reddish orange-brown silty sandy CLAY
			0.40			Pale yellowish brown clayy silty fine SAND with abundant fine white chalk fragments and occasional flint gravel
1.00	D					
			1.65			Firm yellowish brown very silty very sandy CLAY with scattered chalk
2.00	D		1.95			Firm pale brown silty sandy CLAY with pale brown chalk fragments and abundant flint gravel
			2.50			Trialpit Complete at 2.50 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

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HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP11
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.20m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D		0.30			TOPSOIL
1.00	D		1.90			Firm reddish orange-brown silty sandy CLAY
2.00	D		2.20			Structureless CHALK comprising a fine to medium gravel of white weak low density chalk fragments with abundant flints within a white comminuted chalk matrix (Grade Dc)

Trialpit Complete at 2.20 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

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HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP12
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 1.70m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D		0.30			TOPSOIL
1.00	D		1.40			Firm reddish orange-brown silty sandy CLAY
2.00	D		1.70			Structureless CHALK comprising a fine to medium gravel of white weak low density chalk fragments with abundant flints within a white comminuted chalk matrix (Grade Dc)

Trialpit Complete at 1.70 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Trialpit No
TP13
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.20m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D					TOPSOIL
			0.30			Firm pale yellowish brown silty CLAY with abundant fragments of chalk
1.00	IVN 1	110				
1.00	IVN 2	120				
1.00	D					
			1.30			Firm yellowish brown silty CLAY
1.50	D					
			1.70			Structureless CHALK comprising a white comminuted chalk matrix with scattered fine gravel of white weak low density chalk fragments with abundant flint cobbles (Grade Dm)
2.00	D					
			2.20			Trialpit Complete at 2.20 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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GEOTECHNICAL & ENVIRONMENTAL

Wilson Bailey Partnership Limited
Tel: 01985 248397
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Trialpit No
TP14
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.80m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL
						Pale yellowish brown very clayey SAND with abundant fine to medium chalk and occaional flint gravel
1.00	D					
2.00	D					
			2.80			Trialpit Complete at 2.80 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

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Trialpit No
TP15
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.90m '	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.30	D					TOPSOIL
			0.50			
0.60	D					Firm reddish orange-brown silty sandy CLAY with flint gravel and cobbles
			0.80			
1.00	D					Off white silty SAND with abundant chalk fragments and cobbles
2.00	D					
			2.40			
2.50	D					Yellowish brown clayey SAND with occasional flint gravel
			2.90			
						Trialpit Complete at 2.90 m

Remarks: Trial pit excavated using a rubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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Wilson Bailey Partnership Limited
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Trialpit No
TP17
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Date
Land at Portsdown Hill	J11144	Level: -	12/08/2011

Location: Bedhampton, Havant, Portsmouth	Dimensions: -	Scale 1:25
Client: BDW Southampton	Depth 2.30m	Logged By DB

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.30	D					TOPSOIL
			0.50			Firm reddish brown CLAY with root hairs and root holes - dessicated
0.80	D					
			0.90			Pale yellow brown off-white very silty slightly clayey SAND with abundant fine chalk and fine flint gravels
1.20	D					
2.00	D					
			2.30			Trialpit Complete at 2.30 m

Remarks: Trial pit excavated using arubber tyred excavator (JCB 3cx) with a 600mm bucket. Trial pit sides stable.

Groundwater: Ground water not ecountered.

AGS

HoleBASE 3.1 (Bld 422.00a) Standard Trialpit Log v2 dated 27th Nov 03

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GEOTECHNICAL & ENVIRONMENTAL

Wilson Bailey Partnership Limited
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Borehole No
BH1
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
Land at Portsdown Hill	J11144		WLS
Location: Bedhampton, Havant, Portsmouth		Level: -	Scale 1:50
Client: BDW Southampton		Dates: 12/08/2011	Logged By DB

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description	
					0.20			TOPSOIL	
								CHALK: recovered as a melange of white chalk fines with occasional low density weak chalk gravel (Grade Dm)	
		1.00 1.00	SPT D	N=18 (3,3/ 4,5,4,5)					1
		2.00 2.00	SPT D	N=31 (4,6/ 7,7,8,9)					2
		3.00 3.00	SPT D	N=31 (4,4/ 7,7,8,9)					3
		4.00 4.00	SPT D	N=17 (4,4/ 5,4,4,4)					4
		5.00 5.00	SPT D	N=16 (3,4/ 5,3,4,4)	5.00			End of Borehole at 5.00 m	5
									6
									7
									8
									9
			Type	Results					

Remarks: Ground water not encountered

AGS

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Wilson Bailey Partnership Limited
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Borehole No
BH2
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
Land at Portsdown Hill	J11144		WLS
Location: Bedhampton, Havant, Portsmouth		Level: -	Scale 1:50
Client: BDW Southampton		Dates: 12/08/2011	Logged By DB

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		0.20	D		0.30			TOPSOIL
		1.00	D		1.20			Pale yellowish brown silty SAND with abundant fine chalk fragments
		2.00	D		2.30			CHALK: recovered as a melange of off-white and pale brown chalk fines with occasional low density weak chalk gravel (Grade Dm)
		3.00	D		3.00			CHALK: recovered as a melange of white chalk fines with abundant low density weak chalk gravel (Grade Dc)
			Type	Results				End of Borehole at 3.00 m

Remarks: Ground water not encountred. Falling head percolation testing carried out in borehole - result presented seperately.

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Borehole No
BH3
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
Land at Portsdown Hill	J11144		WLS
Location: Bedhampton, Havant, Portsmouth		Level: -	Scale 1:50
Client: BDW Southampton		Dates: 12/08/2011	Logged By DB

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		0.20	D		0.30			TOPSOIL
		0.50	D		0.60			Fine to medium brown SAND
		1.00 1.00	SPT D	N=32 (4,7/ 8,8,9,7)				Dense and medium dense pale brown off white silty SAND with abundant flints
		2.00 2.00	SPT D	N=18 (4,5/ 5,4,4,5)				
		3.00 3.00	SPT D	N=13 (2,3/ 3,3,4,3)	3.20			CHALK: recovered as a melange of white chalk fines with abundant low density weak chalk gravel (Grade Dc)
		4.00 4.00	SPT D	N=12 (3,3/ 3,2,3,4)				
		5.00 5.00	SPT D	N=27 (7,6/ 6,7,7,7)	5.00			End of Borehole at 5.00 m
			Type	Results				

Remarks: Ground water not encountered.

AGS

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Borehole No
BH4
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
Land at Portsdown Hill	J11144		WLS
Location: Bedhampton, Havant, Portsmouth		Level: -	Scale 1:50
Client: BDW Southampton		Dates: 12/08/2011	Logged By DB

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
		0.30	D		0.40			TOPSOIL
		1.00	D					CHALK: recovered as a melange of white chalk fines with occasional low density weak chalk gravel (Grade Dm)
		2.00	D					
		3.00	D					
					3.45			End of Borehole at 3.45 m
			Type	Results				

Remarks: Ground water not encountered

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Wilson Bailey Partnership Limited
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Borehole No
BH5
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
Land at Portsdown Hill	J11144		WLS
Location: Bedhampton, Havant, Portsmouth		Level: -	Scale 1:50
Client: BDW Southampton		Dates: 12/08/2011	Logged By DB

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
								TOPSOIL
					0.70			Dense and medium dense off-white and pale brown silty SAND with abundant chalk and flint gravel
		1.00 1.00	SPT D	N=49 (6,6/ 7,9,13,20)				
		2.00 2.00	SPT D	N=16 (3,4/ 4,3,4,5)				
					2.40			Firm pale brown silty sandy CLAY with fine chalk fragments and scattered flint gravel
		3.00 3.00	SPT D	N=16 (4,4/ 3,5,4,4)	3.20			CHALK: recovered as a melange of off-white and pale brown chalk fines with occasional low density weak chalk gravel (grade Dm)
		4.00 4.00	SPT D	N=11 (3,3/ 3,2,3,3)				
					4.45			End of Borehole at 4.45 m
			Type	Results				

Remarks: Ground water not encountered

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Wilson Bailey Partnership Limited
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Borehole No
BH6
Sheet 1 of 1

Project Name	Project No.	Co-ords: -	Hole Type
Land at Portsdown Hill	J11144		WLS
Location: Bedhampton, Havant, Portsmouth		Level: -	Scale 1:50
Client: BDW Southampton		Dates: 12/08/2011	Logged By DB

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m AOD)	Legend	Stratum Description
					0.40			MADE GROUND (gravel road)
		1.00 1.00	SPT D	N=6 (1,1/ 1,2,1,2)				Firm reddish orange-brown silty sandy CLAY with occasional flint gravel
		2.00 2.00	SPT D	N=14 (2,3/ 3,4,4,3)	2.10			White and off-white silty SAND with abundant chalk fragments and occasional fine flint gravel
					2.50			Medium dense pale yellow slightly clayey silty fine SAND with occasional chalk gravel
		3.00 3.00	SPT D	N=13 (2,2/ 3,3,3,4)				
					3.45			End of Borehole at 3.45 m
			Type	Results				

Remarks: Ground water not encountered. Falling head percolation testing carried out in borehole - results presented seperately.

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WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Forge Farmyard
Compton Chamberlayne
Salisbury, Wiltshire
SP3 5DS

Borehole Soakage Test

Site Portsdown Hill Site, Havant, Hampshire

Client BDW Southampton

Job Number J11144

Sheet 2/2

Date: 12 August 2011

Borehole No: 2

Test Data

Before start of test:

Borehole depth (m): 3.00
Casing depth (m): --
Water level (m): --

Time (mins)	Depth to Water (m)	Depth of Water (m)
0	0	3.00
1	1.2	1.80
2	1.78	1.22
3	2.34	0.66
8	2.65	0.35
10	2.85	0.15

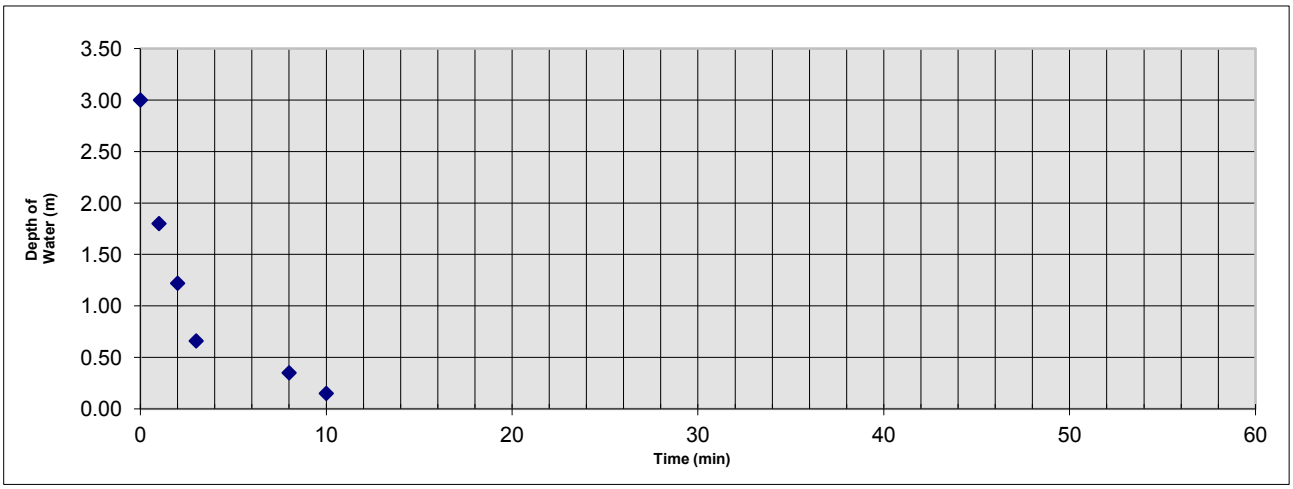
Soakage Calculation

Borehole Diameter (m)	0.0600	
Borehole Area (m)	0.0028	
Borehole Perimeter (m)	0.188	
From Plot:	D1 (m)	1.8
	D2 (m)	0.66
	T1 (min)	1
	T2 (min)	3
Soakage Volume (m^3)	0.003	
Soakage Area (m^2)	0.23	
Time (min)	2	

Soakage rate (m/sec)	1.14E-04
Soakage rate (m/day)	9.889156627

At end of test:

Borehole depth (m): 2.85
Casing depth (m): 0
Water level (m): 2.85



Remarks:

Borehole left open for 40 minutes prior to testing to determine natural water level
Test repeated twice with similar results, with the borehole water draining to natural water level in less than two minutes

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Forge Farmyard
Compton Chamberlayne
Salisbury, Wiltshire
SP3 5DS

Borehole Soakage Test

Site Portsdown Hill Site, Havant, Hampshire

Client BDW Southampton

Job Number J11144

Sheet 2/2

Date: 12 August 2011

Borehole No: 6

Test Data

Before start of test:

Borehole depth (m): 3.00
Casing depth (m): --
Water level (m): --

Time (mins)	Depth to Water (m)	Depth of Water (m)
0	0.66	2.34
1	0.74	2.26
3	0.9	2.10
9	1	2.00
13	1.05	1.95
21	1.3	1.70
29	1.48	1.52
43	1.76	1.24

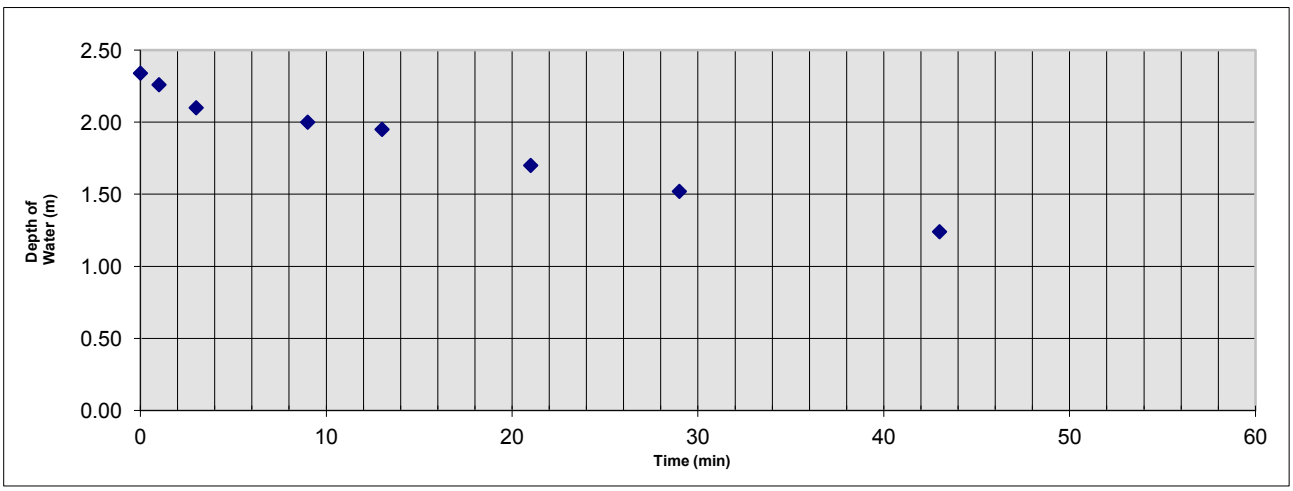
At end of test:

Borehole depth (m): 2.53
Casing depth (m): 0
Water level (m): 1.76

Soakage Calculation

Borehole Diameter (m)	0.0600	
Borehole Area (m)	0.0028	
Borehole Perimeter (m)	0.188	
From Plot:	D1 (m)	2.34
	D2 (m)	1.24
	T1 (min)	0
	T2 (min)	43
Soakage Volume (m^3)	0.003	
Soakage Area (m^2)	0.34	
Time (min)	43	

Soakage rate (m/sec)	3.54E-06
Soakage rate (m/day)	0.306126393



Remarks:
Borehole left open for 40 minutes prior to testing to determine natural water level
Test repeated twice with similar results, with the borehole water draining to natural water level in less than two minutes

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Forge Farmyard
Compton Chamberlayne
Salisbury, Wiltshire
SP3 5DS

Borehole Soakage Test

Site Portsdown Hill Site, Havant, Hampshire

Client BDW Southampton

Job Number J11144

Sheet 2/2

Date: 12 August 2011

Borehole No: 5

Test Data

Before start of test:

Borehole depth (m): 3.00
Casing depth (m): --
Water level (m): --

Time (mins)	Depth to Water (m)	Depth of Water (m)
0	0.5	2.50
1	0.62	2.38
2	0.75	2.25
5	0.98	2.02
7	1.05	1.95
15	1.3	1.70
29	1.78	1.22
43	2.43	0.57

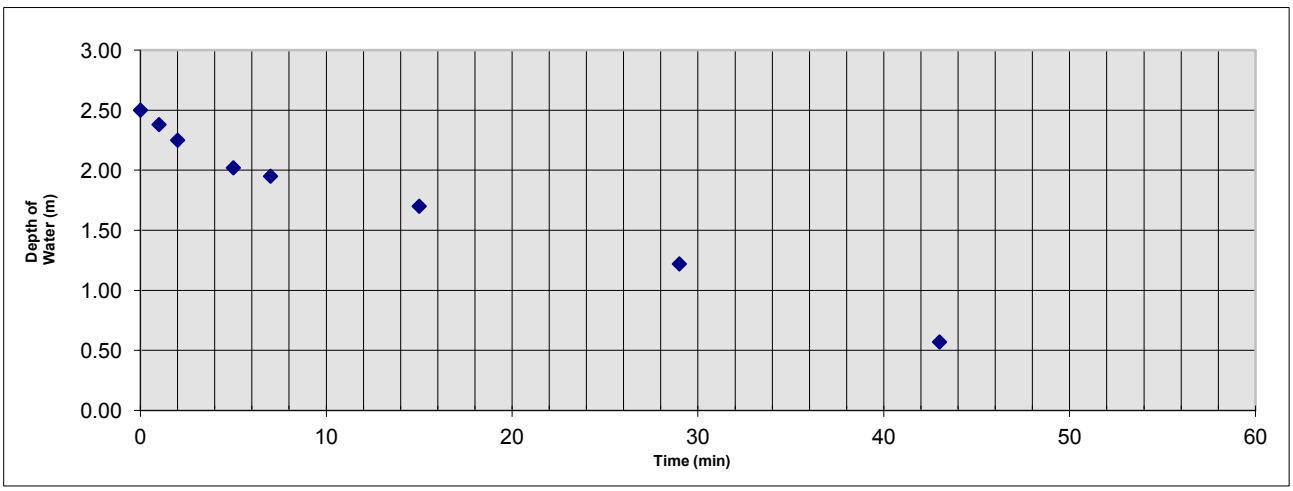
At end of test:

Borehole depth (m): 2.76
Casing depth (m): 0
Water level (m): 2,43

Soakage Calculation

Borehole Diameter (m)		0.0600
Borehole Area (m)		0.0028
Borehole Perimeter (m)		0.188
From Plot:	D1 (m)	2.50
	D2 (m)	0.57
	T1 (min)	0
	T2 (min)	43
Soakage Volume (m^3)		0.005
Soakage Area (m^2)		0.29
Time (min)		43

Soakage rate (m/sec)	7.24E-06
Soakage rate (m/day)	0.625476369



Remarks:

Borehole left open for 40 minutes prior to testing to determine natural water level
Test repeated twice with similar results, with the borehole water draining to natural water level in less than two minutes

Project Name:	Portsdown Hill	**Samples Received:**	16/08/2011
		Project Started:	23/08/2011
Client:	Wilson Bailey Geotechnical & Environmental	**Testing Started:**	05/09/2011
Project No:	- **Our job/report no:** 11513	**Date Reported:**	07/09/2011

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
BH6	-	1.00	Brown and orange brown slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)	18					
TP1	-	1.00	Brown slightly silty slightly gravelly CLAY with occasional chalk fragments (gravel is fmc and sub-angular)	15	29	16	13	90	
TP2	-	0.50	Brown slightly sandy slightly gravelly CLAY (gravel is fine and sub-angular)	21	51	19	32	85	
TP2	-	1.00	Brown slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)	23					
TP3	-	0.50	Brown slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular to angular)	21					
TP4	-	0.90	Brown slightly sandy slightly gravelly CLAY (gravel is fine and angular)	16	46	17	29	91	
TP5	-	1.00	Brown and orange brown slightly sandy gravelly CLAY (gravel is fm and sub-angular to angular)	17	46	15	31	64	
TP7	-	1.00	Orange brown slightly sandy gravelly CLAY (gravel is fm and sub-angular)	18	42	18	24	60	
TP10	-	1.00	Pale brown slightly silty slightly gravelly CLAY with occasional chalk fragments (gravel is fine and sub-angular)	16	38	18	20	93	
TP13	-	1.00	Brown slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular)	20	45	18	27	90	
TP13	-	1.50	Yellowish brown sandy silty CLAY	19					
TP14	-	1.00	Yellowish brown slightly silty slightly gravelly CLAY (gravel is fine and sub-angular)	14					
TP15	-	1.00	Yellowish brown slightly silty slightly gravelly CLAY (gravel is fm and sub-angular)	14					
TP16	-	1.00	Orange brown slightly silty slightly gravelly CLAY with occasional chalk fragments (gravel is fm and sub-angular)	14	28	16	12	86	
TP17	-	0.80	Brown slightly sandy slightly gravelly CLAY (gravel is fine and sub-angular to angular)	17	52	19	33	89	

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: 07/09/2011

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)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

Project Name:	Portsdown Hill		K4 SOILS
Client:	Environmental	Project no: -	
		Our job no: 11513	

Borehole No:	Sample No:	Depth m	Description	pH	Sulphate content (g/l)
TP2	-	0.50	Brown slightly sandy slightly gravelly CLAY (gravel is fine and sub-angular)	7.8	0.09
TP5	-	1.00	Brown and orange brown slightly sandy gravelly CLAY (gravel is fm and sub-angular to angular)	7.7	0.09
TP13	-	1.00	Brown slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular)	7.8	0.10

Summary of Test Results

Date 07/09/2011

BS 1377 : Part 3 :Clause 5 : 1990

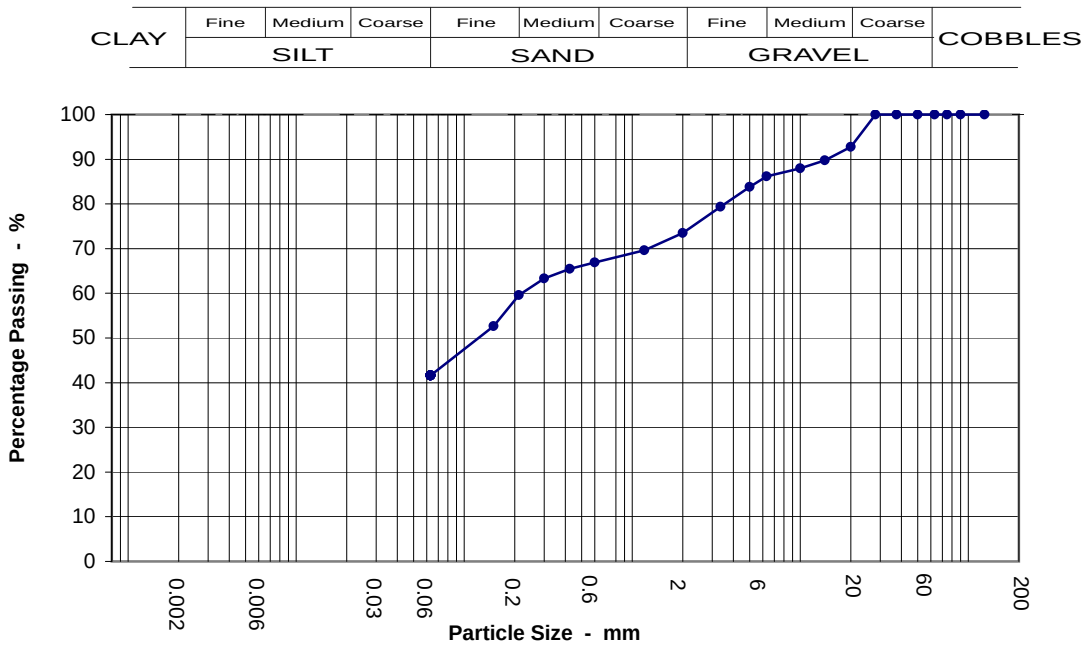
Determination of sulphate content of soil and ground water : gravimetric method

Checked and Approved

Initials : kp

Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	11513
		Project No:	-
Location	Portsdown Hill	Borehole / Trial Pit No:	TP3
		Depth	1.00 m
Visual Soil Description	Brown slightly gravelly sandy clayey SILT with occasional fm chalk fragments (gravel is fmc and sub-rounded to angular)	Sample Type/No	- 0



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	93		
14	90		
10	88		
6.3	86		
5	84		
3.35	79		
2	74		
1.18	70		
0.6	67		
0.425	65		
0.3	63		
0.212	60		
0.15	53		
0.063	42		

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

Sample Proportions	
Cobbles	0.0
Gravel	26.5
Sand	31.9
Silt & Clay	41.6

Grading Analysis	
D100	125.0
D60	0.2
D10	
Uniformity Coefficient	N/A

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

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

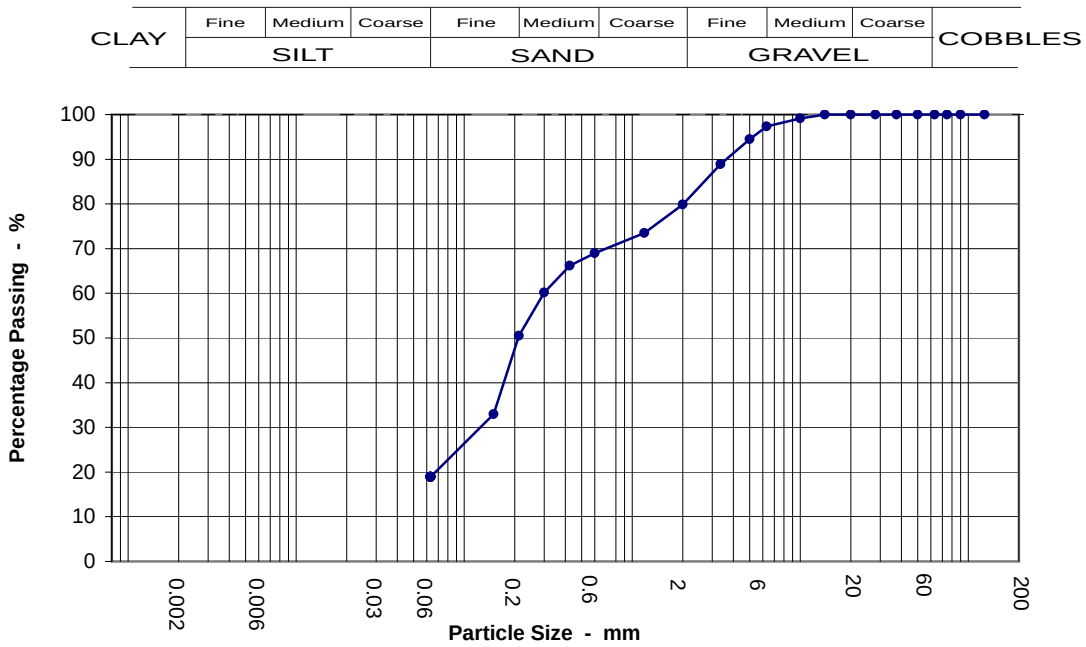
Test results relate only to the sample numbers shown above

Checked and Approved
Initials: kp
Date: 07/09/2011

UKAS TESTING 2519

All samples connected with this report, incl any on 'hold' will be disposed off according to company policy. A copy of this policy is available on request. Sheet 3/3 MSF-11/R9

K4 SOILS	PARTICLE SIZE DISTRIBUTION BS 1377 : Part 2 : 1990 : Clause 9	Our Report No:	11513
		Project No:	-
Location	Portsdown Hill	Borehole / Trial Pit No:	TP7
		Depth	2.00 m
Visual Soil Description	Brown slightly clayey slightly gravelly SAND with occasional fm chalk fragments (gravel is fm and sub-rounded to sub-angular)	Sample Type/No	- 0



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	97		
5	94		
3.35	89		
2	80		
1.18	73		
0.6	69		
0.425	66		
0.3	60		
0.212	50		
0.15	33		
0.063	19		

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

Sample Proportions	
Cobbles	0.0
Gravel	20.1
Sand	61.0
Silt & Clay	18.9

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

K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU.
E-mail: k4soils@aol.com

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: 07/09/2011

UKAS TESTING 2519

All samples connected with this report, incl any on 'hold' will be disposed off according to company policy. A copy of this policy is available on request. Sheet 3/3 MSF-11/R9

Dominic Brightman
Wilson Bailey Ltd
Forge Farm Yard
Compton Chamberlayne
Wiltshire SP3 5DS

4480 4480

QTS Environmental Ltd
Unit 1
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Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 851105
russell.jarvis@qtsenvironmental.com

QTS Environmental Report No: 6923

Site Reference: Portsdown Hill

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 16/08/2011

Sample Scheduled Date: 16/08/2011

Report Issue Number: 1

Reporting Date: 23/08/2011

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

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UKAS TESTING 4480 mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP1	TP2	TP4	TP7	BH2
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.25	0.25	0.30	0.20
Reporting Date: 23/08/2011	**QTSE Sample No**	31130	31131	31132	31133	31134

Determinand	**Unit**	**MDL**	**Accreditation**					
Stone Content	%	<0.1	NONE	<0.1	<0.1	<0.1	<0.1	<0.1

General Inorganics	**Unit**	**MDL**	**Accreditation**					
pH	pH Units	+ / - 0.1	**MCERTS**	7.5	7.3	6.5	7.1	7.8
Total Organic Carbon (TOC)	%	<0.1	NONE	1.6	1.8	0.7	1.1	1.3
Total Phenols (monohydric)	mg/kg	<2	NONE	<2	<2	<2	<2	<2

Metals	**Unit**	**MDL**	**Accreditation**					
Arsenic (As)	mg/kg	<2	**MCERTS**	8	8	7	7	5
W/S Boron	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Cadmium (Cd)	mg/kg	<0.5	**MCERTS**	0.7	1	0.6	0.5	0.7
Chromium (hexavalent)	mg/kg	<2	NONE	<2	<2	<2	<2	<2
Chromium (Cr)	mg/kg	<2	**MCERTS**	25	23	20	18	20
Copper (Cu)	mg/kg	<4	**MCERTS**	14	14	16	13	10
Lead (Pb)	mg/kg	<3	**MCERTS**	24	28	38	27	13
Mercury (Hg)	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Nickel (Ni)	mg/kg	<3	**MCERTS**	19	17	14	13	16
Selenium (Se)	mg/kg	<3	NONE	<3	<3	<3	<3	<3
Zinc (Zn)	mg/kg	<3	**MCERTS**	60	61	56	52	59

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content

Stone content is classified as material greater than 10mm in diameter

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UKAS TESTING 4480 mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP9	TP13	TP15	TP17	BH4
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.20	0.30	0.30	0.30
Reporting Date: 23/08/2011	**QTSE Sample No**	31135	31136	31137	31138	31139

Determinand	**Unit**	**MDL**	**Accreditation**					
Stone Content	%	<0.1	NONE	<0.1	<0.1	<0.1	<0.1	<0.1

General Inorganics	**Unit**	**MDL**	**Accreditation**					
pH	pH Units	+ / - 0.1	**MCERTS**	7.8	7.7	7.9	7.7	7.8
Total Organic Carbon (TOC)	%	<0.1	NONE	1.1	1.5	1.1	0.8	1.5
Total Phenols (monohydric)	mg/kg	<2	NONE	<2	<2	<2	<2	<2

Metals	**Unit**	**MDL**	**Accreditation**					
Arsenic (As)	mg/kg	<2	**MCERTS**	8	7	8	7	7
W/S Boron	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Cadmium (Cd)	mg/kg	<0.5	**MCERTS**	0.6	0.7	0.9	0.6	0.7
Chromium (hexavalent)	mg/kg	<2	NONE	<2	<2	<2	<2	<2
Chromium (Cr)	mg/kg	<2	**MCERTS**	12	22	29	28	13
Copper (Cu)	mg/kg	<4	**MCERTS**	6	9	13	12	8
Lead (Pb)	mg/kg	<3	**MCERTS**	10	14	15	15	13
Mercury (Hg)	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Nickel (Ni)	mg/kg	<3	**MCERTS**	11	15	22	20	9
Selenium (Se)	mg/kg	<3	NONE	<3	<3	<3	<3	<3
Zinc (Zn)	mg/kg	<3	**MCERTS**	36	49	74	66	40

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content

Stone content is classified as material greater than 10mm in diameter

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UKAS TESTING 4480 | MCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP1	TP2	TP4	TP7	BH2
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.25	0.25	0.30	0.20
Reporting Date: 23/08/2011	**QTSE Sample No**	31130	31131	31132	31133	31134

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

Total EPA-16 PAHs	mg/kg	<1.6	MCERTS	<1.6	<1.6	<1.6	<1.6	<1.6

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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4480 **4480**

Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP9	TP13	TP15	TP17	BH4
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.20	0.30	0.30	0.30
Reporting Date: 23/08/2011	**QTSE Sample No**	31135	31136	31137	31138	31139

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

Total EPA-16 PAHs	mg/kg	<1.6	**MCERTS**	<1.6	<1.6	<1.6	<1.6	<1.6

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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UKAS TESTING 4480 mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP1	TP2	TP4	TP7	BH2
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.25	0.25	0.30	0.20
Reporting Date: 23/08/2011	**QTSE Sample No**	31130	31131	31132	31133	31134

Determinand	**Unit**	**MDL**	**Accreditation**					
Aliphatic >C5 - C6	mg/kg	<0.01	NONE	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic >C6 - C8	mg/kg	<0.05	NONE	<0.05	<0.05	<0.05	<0.05	<0.05
Aliphatic >C8 - C10	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C10 - C12	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C12 - C16	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C16 - C21	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C21 - C34	mg/kg	<6	NONE	<6	<6	<6	<6	<6
Aliphatic (C5 - C34)	mg/kg	<6	NONE	<6	<6	<6	<6	<6
Aromatic >C5 - C7	mg/kg	<0.01	NONE	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic >C7 - C8	mg/kg	<0.05	NONE	<0.05	<0.05	<0.05	<0.05	<0.05
Aromatic >C8 - C10	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C10 - C12	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C12 - C16	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C16 - C21	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C21 - C35	mg/kg	<6	NONE	<6	<6	<6	<6	<6
Aromatic (C5 - C35)	mg/kg	<6	NONE	<6	<6	<6	<6	<6

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UKAS TESTING 4480

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate - TPH CWG Banded						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP9	TP13	TP15	TP17	BH4
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.20	0.30	0.30	0.30
Reporting Date: 23/08/2011	**QTSE Sample No**	31135	31136	31137	31138	31139

Determinand	**Unit**	**MDL**	**Accreditation**					
Aliphatic >C5 - C6	mg/kg	<0.01	NONE	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatic >C6 - C8	mg/kg	<0.05	NONE	<0.05	<0.05	<0.05	<0.05	<0.05
Aliphatic >C8 - C10	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C10 - C12	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C12 - C16	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C16 - C21	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aliphatic >C21 - C34	mg/kg	<6	NONE	<6	<6	<6	<6	<6
Aliphatic (C5 - C34)	mg/kg	<6	NONE	<6	<6	<6	<6	<6
Aromatic >C5 - C7	mg/kg	<0.01	NONE	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatic >C7 - C8	mg/kg	<0.05	NONE	<0.05	<0.05	<0.05	<0.05	<0.05
Aromatic >C8 - C10	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C10 - C12	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C12 - C16	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C16 - C21	mg/kg	<1	NONE	<1	<1	<1	<1	<1
Aromatic >C21 - C35	mg/kg	<6	NONE	<6	<6	<6	<6	<6
Aromatic (C5 - C35)	mg/kg	<6	NONE	<6	<6	<6	<6	<6

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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4480 **4480**

Soil Analysis Certificate - BTEX						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP1	TP2	TP4	TP7	BH2
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.25	0.25	0.30	0.20
Reporting Date: 23/08/2011	**QTSE Sample No**	31130	31131	31132	31133	31134

Determinand	**Unit**	**MDL**	**Accreditation**					
Benzene	µg/kg	<2	**MCERTS**	<2	<2	<2	<2	<2
Toluene	µg/kg	<5	**MCERTS**	<5	<5	<5	<5	<5
Ethylbenzene	µg/kg	<10	**MCERTS**	<10	<10	<10	<10	<10
p & m-xylene	µg/kg	<10	**MCERTS**	<10	<10	<10	<10	<10
o-xylene	µg/kg	<10	**MCERTS**	<10	<10	<10	<10	<10

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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UKAS TESTING 4480 mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate - BTEX						
QTS Environmental Report No: 6923	**Date Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Wilson Bailey Ltd	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Portsdown Hill	**TP / BH No**	TP9	TP13	TP15	TP17	BH4
Project / Job Ref: None Supplied	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.20	0.20	0.30	0.30	0.30
Reporting Date: 23/08/2011	**QTSE Sample No**	31135	31136	31137	31138	31139

Determinand	**Unit**	**MDL**	**Accreditation**					
Benzene	µg/kg	<2	**MCERTS**	<2	<2	<2	<2	<2
Toluene	µg/kg	<5	**MCERTS**	<5	<5	<5	<5	<5
Ethylbenzene	µg/kg	<10	**MCERTS**	<10	<10	<10	<10	<10
p & m-xylene	µg/kg	<10	**MCERTS**	<10	<10	<10	<10	<10
o-xylene	µg/kg	<10	**MCERTS**	<10	<10	<10	<10	<10

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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UKAS TESTING 4480 mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME 4480

Soil Analysis Certificate - Sample Descriptions

QTS Environmental Report No: 6923
Wilson Bailey Ltd
Site Reference: Portsdown Hill
Project / Job Ref: None Supplied
Order No: None Supplied
Reporting Date: 23/08/2011

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
31130	TP1	None Supplied	0.20	11	Red loamy clay with stones
31131	TP2	None Supplied	0.25	13.6	Brown loamy clay
31132	TP4	None Supplied	0.25	12.8	Brown clayey loam
31133	TP7	None Supplied	0.30	10.7	Brown clayey loam
31134	BH2	None Supplied	0.20	9.5	Brown loamy clay
31135	TP9	None Supplied	0.20	12.9	Brown loamy clay with chalk
31136	TP13	None Supplied	0.20	14.5	Brown loamy clay with chalk
31137	TP15	None Supplied	0.30	13.9	Brown clayey loam
31138	TP17	None Supplied	0.30	11.5	Brown loamy clay
31139	BH4	None Supplied	0.30	9	Brown loamy clay

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UKAS TESTING 4480 mCERTS 4480

Soil Analysis Certificate - Methodology & Misceallaneous Information
QTS Environmental Report No: 6923
Wilson Bailey Ltd
Site Reference: Portsdown Hill
Project / Job Ref: None Supplied
Order No: None Supplied
Reporting Date: 23/08/2011

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	AR	Asbestos Screening	Visual screening of samples for fibrous material	E024
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water followed by titration using silver nitrate	E021
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by turbidimeter	E020
Soil	D	Fluoride - Water Soluble	Test Kit	E023
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	D	Phosphorus	Determination of phosphorus by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	AR	Sulphide	Determination of sulphide by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia, potassium iodide/iodate followed by ICP-OES	E002
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E009
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E009
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E010
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E009
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	EPH (with florisil cleanup)	Determination of acetone/hexane extractable hydrocarbons with florisil cleanup step by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001

Key

D Dried
AR As Received

Radon Risk Report for addresses in England and Wales

Issued by the Health Protection Agency and the British Geological Survey using Address Point®. Fee paid £3.00 + VAT. Email receipt issued by Secure Trading Ltd.

Address searched: 9 Spinnaker View, Havant, PO9 3JD

Numerical grid reference for this address:

469469 East

106239 North

Date of report: 23/09/2011

Guidance for existing properties

Is this property in a radon Affected Area? - NO

The answer to the standard enquiry on house purchase known as CON29 Standard Enquiry of Local Authority; 3.13 Radon Gas: Location of the Property in a Radon Affected Area is:

No, this property is not in a Radon Affected Area as defined by the Health Protection Agency.
The estimated probability of the property being above the Action Level for radon is:0-1%

The result may not be valid for buildings larger than 25 metres.

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

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

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

Further information is available from HPA or www.ukradon.org.

Guidance for new buildings and extensions to existing properties

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

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

See the Radon and Building Regulations for more details.

Radon Risk Report for addresses in England and Wales

Issued by the Health Protection Agency and the British Geological Survey using Address Point®. Fee paid £3.00 + VAT. Email receipt issued by Secure Trading Ltd.

Address searched: 70 Bedhampton Hill, Havant, PO9 3JP

Numerical grid reference for this address:

469453 East

106053 North

Date of report: 23/09/2011

Guidance for existing properties

Is this property in a radon Affected Area? - NO

The answer to the standard enquiry on house purchase known as CON29 Standard Enquiry of Local Authority; 3.13 Radon Gas: Location of the Property in a Radon Affected Area is:

No, this property is not in a Radon Affected Area as defined by the Health Protection Agency.
The estimated probability of the property being above the Action Level for radon is:0-1%

The result may not be valid for buildings larger than 25 metres.

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

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See the Radon and Building Regulations for more details.

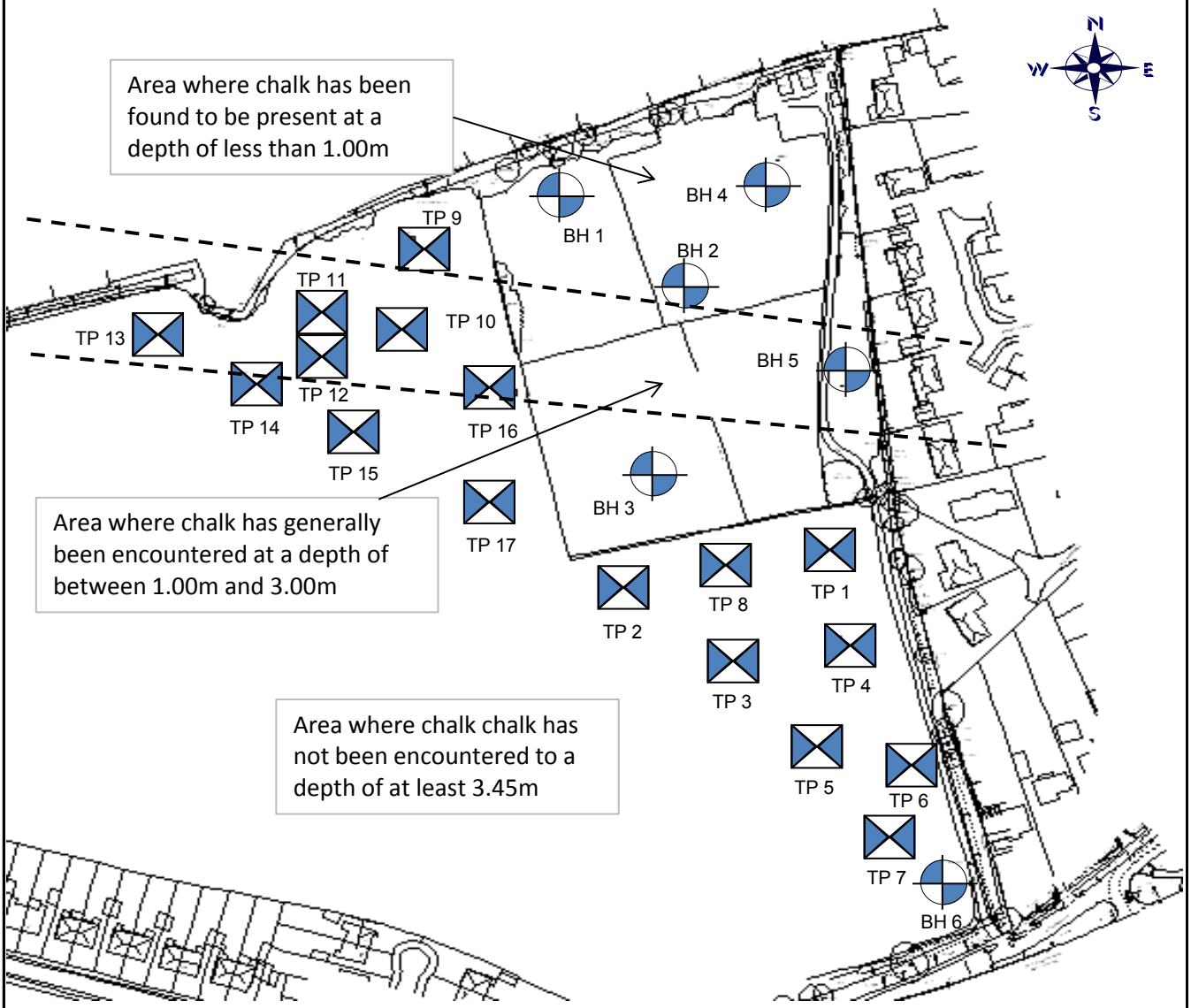
WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Forge Farmyard
Compton Chamberlayne
Salisbury, Wiltshire
SP3 5DS

Site Plan

Site Land at Portsdwon Hill, Havant, Hampshire

Client Barratt David Wilson Southampton



0 50 100 150

Approximate Scale in metres

Appendix 3

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 2183 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.758	0.158	0.2	15.0	Flood Risk
30 min Summer	9.811	0.211	0.2	20.1	Flood Risk
60 min Summer	9.869	0.269	0.2	25.6	Flood Risk
120 min Summer	9.929	0.329	0.2	31.2	Flood Risk
180 min Summer	9.962	0.362	0.2	34.4	Flood Risk
240 min Summer	9.984	0.384	0.2	36.5	Flood Risk
360 min Summer	10.013	0.413	0.2	39.3	FLOOD
480 min Summer	10.033	0.433	0.2	41.1	FLOOD
600 min Summer	10.046	0.446	0.2	42.4	FLOOD
720 min Summer	10.055	0.455	0.2	43.2	FLOOD
960 min Summer	10.066	0.466	0.2	44.3	FLOOD
1440 min Summer	10.069	0.469	0.2	44.6	FLOOD
2160 min Summer	10.058	0.458	0.2	43.5	FLOOD
2880 min Summer	10.044	0.444	0.2	42.2	FLOOD
4320 min Summer	10.016	0.416	0.2	39.5	FLOOD
5760 min Summer	9.988	0.388	0.2	36.9	Flood Risk
7200 min Summer	9.961	0.361	0.2	34.3	Flood Risk
8640 min Summer	9.937	0.337	0.2	32.0	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	117.069	19
30 min Summer	78.692	34
60 min Summer	50.485	64
120 min Summer	31.269	124
180 min Summer	23.274	184
240 min Summer	18.738	244
360 min Summer	13.779	362
480 min Summer	11.072	482
600 min Summer	9.336	602
720 min Summer	8.117	722
960 min Summer	6.503	962
1440 min Summer	4.749	1440
2160 min Summer	3.461	1836
2880 min Summer	2.761	2192
4320 min Summer	2.005	2980
5760 min Summer	1.595	3808
7200 min Summer	1.335	4616
8640 min Summer	1.156	5440

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	9.913	0.313	0.2	29.7	Flood Risk
15 min Winter	9.777	0.177	0.2	16.8	Flood Risk
30 min Winter	9.837	0.237	0.2	22.5	Flood Risk
60 min Winter	9.902	0.302	0.2	28.7	Flood Risk
120 min Winter	9.969	0.369	0.2	35.1	Flood Risk
180 min Winter	10.008	0.408	0.2	38.7	FLOOD
240 min Winter	10.033	0.433	0.2	41.1	FLOOD
360 min Winter	10.067	0.467	0.2	44.4	FLOOD
480 min Winter	10.090	0.490	0.2	46.6	FLOOD
600 min Winter	10.107	0.507	0.2	48.1	FLOOD
720 min Winter	10.119	0.519	0.2	49.3	FLOOD
960 min Winter	10.134	0.534	0.2	50.7	FLOOD
1440 min Winter	10.145	0.545	0.2	51.7	FLOOD
2160 min Winter	10.136	0.536	0.2	50.9	FLOOD
2880 min Winter	10.117	0.517	0.2	49.1	FLOOD
4320 min Winter	10.079	0.479	0.2	45.5	FLOOD
5760 min Winter	10.038	0.438	0.2	41.7	FLOOD
7200 min Winter	9.998	0.398	0.2	37.8	Flood Risk
8640 min Winter	9.960	0.360	0.2	34.2	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	1.023	6248
15 min Winter	117.069	19
30 min Winter	78.692	34
60 min Winter	50.485	64
120 min Winter	31.269	122
180 min Winter	23.274	182
240 min Winter	18.738	240
360 min Winter	13.779	358
480 min Winter	11.072	476
600 min Winter	9.336	592
720 min Winter	8.117	708
960 min Winter	6.503	942
1440 min Winter	4.749	1396
2160 min Winter	3.461	2036
2880 min Winter	2.761	2364
4320 min Winter	2.005	3240
5760 min Winter	1.595	4152
7200 min Winter	1.335	5040
8640 min Winter	1.156	5880

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	9.925	0.325	0.2	30.8	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	1.023	6664

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time / Area Diagram

Total Area (ha) 0.069

Time (mins)	**Area (ha)**
0-4	0.069

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01274 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01274

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	100.0	100.0	0.400	100.0	116.0

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Summary of Results for 30 year Return Period

Half Drain Time : 1224 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.693	0.093	0.2	8.9	O K
30 min Summer	9.724	0.124	0.2	11.7	Flood Risk
60 min Summer	9.756	0.156	0.2	14.8	Flood Risk
120 min Summer	9.789	0.189	0.2	17.9	Flood Risk
180 min Summer	9.807	0.207	0.2	19.7	Flood Risk
240 min Summer	9.819	0.219	0.2	20.8	Flood Risk
360 min Summer	9.835	0.235	0.2	22.3	Flood Risk
480 min Summer	9.844	0.244	0.2	23.2	Flood Risk
600 min Summer	9.849	0.249	0.2	23.7	Flood Risk
720 min Summer	9.852	0.252	0.2	24.0	Flood Risk
960 min Summer	9.853	0.253	0.2	24.1	Flood Risk
1440 min Summer	9.851	0.251	0.2	23.9	Flood Risk
2160 min Summer	9.844	0.244	0.2	23.1	Flood Risk
2880 min Summer	9.834	0.234	0.2	22.2	Flood Risk
4320 min Summer	9.812	0.212	0.2	20.2	Flood Risk
5760 min Summer	9.791	0.191	0.2	18.1	Flood Risk
7200 min Summer	9.771	0.171	0.2	16.2	Flood Risk
8640 min Summer	9.752	0.152	0.2	14.5	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	69.605	19
30 min Summer	46.335	34
60 min Summer	29.553	64
120 min Summer	18.298	124
180 min Summer	13.667	182
240 min Summer	11.055	242
360 min Summer	8.183	362
480 min Summer	6.606	482
600 min Summer	5.592	600
720 min Summer	4.877	720
960 min Summer	3.929	916
1440 min Summer	2.893	1140
2160 min Summer	2.127	1536
2880 min Summer	1.708	1936
4320 min Summer	1.253	2764
5760 min Summer	1.005	3576
7200 min Summer	0.846	4328
8640 min Summer	0.736	5104

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	9.735	0.135	0.2	12.9	Flood Risk
15 min Winter	9.705	0.105	0.2	10.0	Flood Risk
30 min Winter	9.739	0.139	0.2	13.2	Flood Risk
60 min Winter	9.775	0.175	0.2	16.6	Flood Risk
120 min Winter	9.813	0.213	0.2	20.2	Flood Risk
180 min Winter	9.834	0.234	0.2	22.2	Flood Risk
240 min Winter	9.848	0.248	0.2	23.5	Flood Risk
360 min Winter	9.866	0.266	0.2	25.3	Flood Risk
480 min Winter	9.878	0.278	0.2	26.4	Flood Risk
600 min Winter	9.885	0.285	0.2	27.1	Flood Risk
720 min Winter	9.890	0.290	0.2	27.5	Flood Risk
960 min Winter	9.893	0.293	0.2	27.9	Flood Risk
1440 min Winter	9.890	0.290	0.2	27.5	Flood Risk
2160 min Winter	9.879	0.279	0.2	26.5	Flood Risk
2880 min Winter	9.865	0.265	0.2	25.2	Flood Risk
4320 min Winter	9.832	0.232	0.2	22.0	Flood Risk
5760 min Winter	9.799	0.199	0.2	18.9	Flood Risk
7200 min Winter	9.768	0.168	0.2	15.9	Flood Risk
8640 min Winter	9.740	0.140	0.2	13.3	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	0.654	5848
15 min Winter	69.605	19
30 min Winter	46.335	33
60 min Winter	29.553	62
120 min Winter	18.298	122
180 min Winter	13.667	180
240 min Winter	11.055	238
360 min Winter	8.183	356
480 min Winter	6.606	472
600 min Winter	5.592	586
720 min Winter	4.877	700
960 min Winter	3.929	922
1440 min Winter	2.893	1328
2160 min Winter	2.127	1648
2880 min Winter	1.708	2108
4320 min Winter	1.253	3024
5760 min Winter	1.005	3864
7200 min Winter	0.846	4680
8640 min Winter	0.736	5440

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	9.715	0.115	0.2	10.9	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	0.654	6152

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time / Area Diagram

Total Area (ha) 0.069

Time (mins)	**Area (ha)**
0-4	0.069

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01274 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01274

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	100.0	100.0	0.400	100.0	116.0

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 2575 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.787	0.187	0.1	12.4	Flood Risk
30 min Summer	9.850	0.250	0.1	16.6	Flood Risk
60 min Summer	9.918	0.318	0.1	21.2	Flood Risk
120 min Summer	9.989	0.389	0.1	25.9	Flood Risk
180 min Summer	10.030	0.430	0.1	28.6	FLOOD
240 min Summer	10.056	0.456	0.1	30.3	FLOOD
360 min Summer	10.092	0.492	0.1	32.7	FLOOD
480 min Summer	10.117	0.517	0.1	34.4	FLOOD
600 min Summer	10.135	0.535	0.1	35.5	FLOOD
720 min Summer	10.147	0.547	0.1	36.4	FLOOD
960 min Summer	10.163	0.563	0.1	37.5	FLOOD
1440 min Summer	10.174	0.574	0.1	38.2	FLOOD
2160 min Summer	10.165	0.565	0.1	37.6	FLOOD
2880 min Summer	10.150	0.550	0.1	36.6	FLOOD
4320 min Summer	10.119	0.519	0.1	34.5	FLOOD
5760 min Summer	10.089	0.489	0.1	32.5	FLOOD
7200 min Summer	10.060	0.460	0.1	30.6	FLOOD
8640 min Summer	10.033	0.433	0.1	28.8	FLOOD

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	117.069	19
30 min Summer	78.692	34
60 min Summer	50.485	64
120 min Summer	31.269	124
180 min Summer	23.274	184
240 min Summer	18.738	244
360 min Summer	13.779	362
480 min Summer	11.072	482
600 min Summer	9.336	602
720 min Summer	8.117	722
960 min Summer	6.503	962
1440 min Summer	4.749	1440
2160 min Summer	3.461	2012
2880 min Summer	2.761	2336
4320 min Summer	2.005	3072
5760 min Summer	1.595	3912
7200 min Summer	1.335	4688
8640 min Summer	1.156	5528

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	10.008	0.408	0.1	27.1	FLOOD
15 min Winter	9.809	0.209	0.1	13.9	Flood Risk
30 min Winter	9.880	0.280	0.1	18.6	Flood Risk
60 min Winter	9.957	0.357	0.1	23.8	Flood Risk
120 min Winter	10.038	0.438	0.1	29.1	FLOOD
180 min Winter	10.083	0.483	0.1	32.2	FLOOD
240 min Winter	10.114	0.514	0.1	34.2	FLOOD
360 min Winter	10.156	0.556	0.1	37.0	FLOOD
480 min Winter	10.185	0.585	0.1	38.9	FLOOD
600 min Winter	10.207	0.607	0.1	40.3	FLOOD
720 min Winter	10.222	0.622	0.1	41.4	FLOOD
960 min Winter	10.244	0.644	0.1	42.8	FLOOD
1440 min Winter	10.263	0.663	0.1	44.1	FLOOD
2160 min Winter	10.262	0.662	0.1	44.0	FLOOD
2880 min Winter	10.245	0.645	0.1	42.9	FLOOD
4320 min Winter	10.204	0.604	0.1	40.2	FLOOD
5760 min Winter	10.162	0.562	0.1	37.4	FLOOD
7200 min Winter	10.119	0.519	0.1	34.5	FLOOD
8640 min Winter	10.078	0.478	0.1	31.8	FLOOD

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	1.023	6352
15 min Winter	117.069	19
30 min Winter	78.692	34
60 min Winter	50.485	64
120 min Winter	31.269	122
180 min Winter	23.274	182
240 min Winter	18.738	240
360 min Winter	13.779	358
480 min Winter	11.072	476
600 min Winter	9.336	594
720 min Winter	8.117	710
960 min Winter	6.503	942
1440 min Winter	4.749	1400
2160 min Winter	3.461	2072
2880 min Winter	2.761	2684
4320 min Winter	2.005	3328
5760 min Winter	1.595	4264
7200 min Winter	1.335	5120
8640 min Winter	1.156	6048

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	10.038	0.438	0.1	29.1	FLOOD

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	1.023	6856

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time / Area Diagram

Total Area (ha) 0.057

Time (mins)	**Area (ha)**
0-4	0.057

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01274 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01274

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	70.0	70.0	0.400	70.0	83.4

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Summary of Results for 30 year Return Period

Half Drain Time : 1434 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.710	0.110	0.1	7.3	Flood Risk
30 min Summer	9.746	0.146	0.1	9.7	Flood Risk
60 min Summer	9.785	0.185	0.1	12.3	Flood Risk
120 min Summer	9.824	0.224	0.1	14.9	Flood Risk
180 min Summer	9.847	0.247	0.1	16.4	Flood Risk
240 min Summer	9.862	0.262	0.1	17.4	Flood Risk
360 min Summer	9.881	0.281	0.1	18.7	Flood Risk
480 min Summer	9.893	0.293	0.1	19.5	Flood Risk
600 min Summer	9.901	0.301	0.1	20.0	Flood Risk
720 min Summer	9.906	0.306	0.1	20.3	Flood Risk
960 min Summer	9.910	0.310	0.1	20.6	Flood Risk
1440 min Summer	9.908	0.308	0.1	20.5	Flood Risk
2160 min Summer	9.901	0.301	0.1	20.0	Flood Risk
2880 min Summer	9.891	0.291	0.1	19.4	Flood Risk
4320 min Summer	9.869	0.269	0.1	17.9	Flood Risk
5760 min Summer	9.847	0.247	0.1	16.4	Flood Risk
7200 min Summer	9.825	0.225	0.1	15.0	Flood Risk
8640 min Summer	9.805	0.205	0.1	13.6	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	69.605	19
30 min Summer	46.335	34
60 min Summer	29.553	64
120 min Summer	18.298	124
180 min Summer	13.667	182
240 min Summer	11.055	242
360 min Summer	8.183	362
480 min Summer	6.606	482
600 min Summer	5.592	602
720 min Summer	4.877	720
960 min Summer	3.929	960
1440 min Summer	2.893	1224
2160 min Summer	2.127	1600
2880 min Summer	1.708	1992
4320 min Summer	1.253	2812
5760 min Summer	1.005	3632
7200 min Summer	0.846	4464
8640 min Summer	0.736	5192

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	9.786	0.186	0.1	12.4	Flood Risk
15 min Winter	9.724	0.124	0.1	8.2	Flood Risk
30 min Winter	9.764	0.164	0.1	10.9	Flood Risk
60 min Winter	9.807	0.207	0.1	13.8	Flood Risk
120 min Winter	9.852	0.252	0.1	16.8	Flood Risk
180 min Winter	9.878	0.278	0.1	18.5	Flood Risk
240 min Winter	9.895	0.295	0.1	19.6	Flood Risk
360 min Winter	9.918	0.318	0.1	21.2	Flood Risk
480 min Winter	9.933	0.333	0.1	22.2	Flood Risk
600 min Winter	9.943	0.343	0.1	22.8	Flood Risk
720 min Winter	9.950	0.350	0.1	23.3	Flood Risk
960 min Winter	9.957	0.357	0.1	23.8	Flood Risk
1440 min Winter	9.958	0.358	0.1	23.8	Flood Risk
2160 min Winter	9.947	0.347	0.1	23.1	Flood Risk
2880 min Winter	9.933	0.333	0.1	22.2	Flood Risk
4320 min Winter	9.900	0.300	0.1	20.0	Flood Risk
5760 min Winter	9.866	0.266	0.1	17.7	Flood Risk
7200 min Winter	9.833	0.233	0.1	15.5	Flood Risk
8640 min Winter	9.802	0.202	0.1	13.4	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	0.654	5960
15 min Winter	69.605	19
30 min Winter	46.335	33
60 min Winter	29.553	64
120 min Winter	18.298	122
180 min Winter	13.667	180
240 min Winter	11.055	240
360 min Winter	8.183	356
480 min Winter	6.606	472
600 min Winter	5.592	588
720 min Winter	4.877	702
960 min Winter	3.929	926
1440 min Winter	2.893	1356
2160 min Winter	2.127	1708
2880 min Winter	1.708	2164
4320 min Winter	1.253	3072
5760 min Winter	1.005	3928
7200 min Winter	0.846	4760
8640 min Winter	0.736	5616

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	9.773	0.173	0.1	11.5	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	0.654	6352

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time / Area Diagram

Total Area (ha) 0.057

Time (mins)	**Area (ha)**
0-4	0.057

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01274 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01274

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	70.0	70.0	0.400	70.0	83.4

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 2387 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.776	0.176	0.1	10.9	Flood Risk
30 min Summer	9.836	0.236	0.1	14.6	Flood Risk
60 min Summer	9.901	0.301	0.1	18.6	Flood Risk
120 min Summer	9.967	0.367	0.1	22.7	Flood Risk
180 min Summer	10.005	0.405	0.1	25.0	FLOOD
240 min Summer	10.030	0.430	0.1	26.5	FLOOD
360 min Summer	10.063	0.463	0.1	28.6	FLOOD
480 min Summer	10.086	0.486	0.1	30.0	FLOOD
600 min Summer	10.102	0.502	0.1	31.0	FLOOD
720 min Summer	10.113	0.513	0.1	31.7	FLOOD
960 min Summer	10.127	0.527	0.1	32.5	FLOOD
1440 min Summer	10.134	0.534	0.1	33.0	FLOOD
2160 min Summer	10.123	0.523	0.1	32.3	FLOOD
2880 min Summer	10.109	0.509	0.1	31.4	FLOOD
4320 min Summer	10.079	0.479	0.1	29.6	FLOOD
5760 min Summer	10.050	0.450	0.1	27.8	FLOOD
7200 min Summer	10.021	0.421	0.1	26.0	FLOOD
8640 min Summer	9.995	0.395	0.1	24.4	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	117.069	19
30 min Summer	78.692	34
60 min Summer	50.485	64
120 min Summer	31.269	124
180 min Summer	23.274	184
240 min Summer	18.738	244
360 min Summer	13.779	362
480 min Summer	11.072	482
600 min Summer	9.336	602
720 min Summer	8.117	722
960 min Summer	6.503	962
1440 min Summer	4.749	1440
2160 min Summer	3.461	1924
2880 min Summer	2.761	2276
4320 min Summer	2.005	3028
5760 min Summer	1.595	3864
7200 min Summer	1.335	4680
8640 min Summer	1.156	5448

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	9.971	0.371	0.1	22.9	Flood Risk
15 min Winter	9.797	0.197	0.1	12.2	Flood Risk
30 min Winter	9.865	0.265	0.1	16.3	Flood Risk
60 min Winter	9.937	0.337	0.1	20.8	Flood Risk
120 min Winter	10.013	0.413	0.1	25.5	FLOOD
180 min Winter	10.056	0.456	0.1	28.1	FLOOD
240 min Winter	10.084	0.484	0.1	29.9	FLOOD
360 min Winter	10.123	0.523	0.1	32.3	FLOOD
480 min Winter	10.150	0.550	0.1	34.0	FLOOD
600 min Winter	10.170	0.570	0.1	35.2	FLOOD
720 min Winter	10.184	0.584	0.1	36.1	FLOOD
960 min Winter	10.203	0.603	0.1	37.2	FLOOD
1440 min Winter	10.218	0.618	0.1	38.2	FLOOD
2160 min Winter	10.214	0.614	0.1	37.9	FLOOD
2880 min Winter	10.195	0.595	0.1	36.7	FLOOD
4320 min Winter	10.155	0.555	0.1	34.3	FLOOD
5760 min Winter	10.113	0.513	0.1	31.7	FLOOD
7200 min Winter	10.071	0.471	0.1	29.1	FLOOD
8640 min Winter	10.030	0.430	0.1	26.6	FLOOD

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	1.023	6256
15 min Winter	117.069	19
30 min Winter	78.692	34
60 min Winter	50.485	64
120 min Winter	31.269	122
180 min Winter	23.274	182
240 min Winter	18.738	240
360 min Winter	13.779	358
480 min Winter	11.072	476
600 min Winter	9.336	594
720 min Winter	8.117	710
960 min Winter	6.503	942
1440 min Winter	4.749	1398
2160 min Winter	3.461	2056
2880 min Winter	2.761	2652
4320 min Winter	2.005	3284
5760 min Winter	1.595	4208
7200 min Winter	1.335	5112
8640 min Winter	1.156	5960

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	9.993	0.393	0.1	24.2	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	1.023	6760

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time / Area Diagram

Total Area (ha) 0.050

Time (mins)	**Area (ha)**
0-4	0.050

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01274 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01274

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	65.0	65.0	0.400	65.0	77.9

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Summary of Results for 30 year Return Period

Half Drain Time : 1343 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.704	0.104	0.1	6.4	Flood Risk
30 min Summer	9.738	0.138	0.1	8.5	Flood Risk
60 min Summer	9.774	0.174	0.1	10.8	Flood Risk
120 min Summer	9.811	0.211	0.1	13.0	Flood Risk
180 min Summer	9.832	0.232	0.1	14.3	Flood Risk
240 min Summer	9.846	0.246	0.1	15.2	Flood Risk
360 min Summer	9.864	0.264	0.1	16.3	Flood Risk
480 min Summer	9.875	0.275	0.1	17.0	Flood Risk
600 min Summer	9.882	0.282	0.1	17.4	Flood Risk
720 min Summer	9.886	0.286	0.1	17.6	Flood Risk
960 min Summer	9.888	0.288	0.1	17.8	Flood Risk
1440 min Summer	9.886	0.286	0.1	17.7	Flood Risk
2160 min Summer	9.879	0.279	0.1	17.2	Flood Risk
2880 min Summer	9.869	0.269	0.1	16.6	Flood Risk
4320 min Summer	9.848	0.248	0.1	15.3	Flood Risk
5760 min Summer	9.825	0.225	0.1	13.9	Flood Risk
7200 min Summer	9.804	0.204	0.1	12.6	Flood Risk
8640 min Summer	9.785	0.185	0.1	11.4	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	69.605	19
30 min Summer	46.335	34
60 min Summer	29.553	64
120 min Summer	18.298	124
180 min Summer	13.667	182
240 min Summer	11.055	242
360 min Summer	8.183	362
480 min Summer	6.606	482
600 min Summer	5.592	602
720 min Summer	4.877	720
960 min Summer	3.929	960
1440 min Summer	2.893	1184
2160 min Summer	2.127	1560
2880 min Summer	1.708	1964
4320 min Summer	1.253	2808
5760 min Summer	1.005	3624
7200 min Summer	0.846	4400
8640 min Summer	0.736	5184

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	9.766	0.166	0.1	10.3	Flood Risk
15 min Winter	9.717	0.117	0.1	7.2	Flood Risk
30 min Winter	9.755	0.155	0.1	9.6	Flood Risk
60 min Winter	9.795	0.195	0.1	12.1	Flood Risk
120 min Winter	9.838	0.238	0.1	14.7	Flood Risk
180 min Winter	9.862	0.262	0.1	16.2	Flood Risk
240 min Winter	9.878	0.278	0.1	17.2	Flood Risk
360 min Winter	9.899	0.299	0.1	18.5	Flood Risk
480 min Winter	9.913	0.313	0.1	19.3	Flood Risk
600 min Winter	9.922	0.322	0.1	19.9	Flood Risk
720 min Winter	9.928	0.328	0.1	20.2	Flood Risk
960 min Winter	9.933	0.333	0.1	20.6	Flood Risk
1440 min Winter	9.932	0.332	0.1	20.5	Flood Risk
2160 min Winter	9.921	0.321	0.1	19.8	Flood Risk
2880 min Winter	9.907	0.307	0.1	19.0	Flood Risk
4320 min Winter	9.874	0.274	0.1	16.9	Flood Risk
5760 min Winter	9.840	0.240	0.1	14.8	Flood Risk
7200 min Winter	9.807	0.207	0.1	12.8	Flood Risk
8640 min Winter	9.777	0.177	0.1	11.0	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	0.654	5952
15 min Winter	69.605	19
30 min Winter	46.335	33
60 min Winter	29.553	62
120 min Winter	18.298	122
180 min Winter	13.667	180
240 min Winter	11.055	240
360 min Winter	8.183	356
480 min Winter	6.606	472
600 min Winter	5.592	588
720 min Winter	4.877	700
960 min Winter	3.929	924
1440 min Winter	2.893	1352
2160 min Winter	2.127	1684
2880 min Winter	1.708	2136
4320 min Winter	1.253	3028
5760 min Winter	1.005	3920
7200 min Winter	0.846	4752
8640 min Winter	0.736	5528

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	9.750	0.150	0.1	9.3	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	0.654	6256

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time / Area Diagram

Total Area (ha) 0.050

Time (mins)	**Area (ha)**
0-4	0.050

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Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 9.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01274 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01274

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	65.0	65.0	0.400	65.0	77.9

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 1318 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	27.552	0.552	0.0	2.2	O K
30 min Summer	27.738	0.738	0.0	2.9	O K
60 min Summer	27.938	0.938	0.0	3.7	O K
120 min Summer	28.140	1.140	0.0	4.5	O K
180 min Summer	28.251	1.251	0.0	4.9	O K
240 min Summer	28.320	1.320	0.0	5.2	O K
360 min Summer	28.407	1.407	0.0	5.5	O K
480 min Summer	28.458	1.458	0.0	5.7	O K
600 min Summer	28.488	1.488	0.0	5.9	O K
720 min Summer	28.503	1.503	0.0	5.9	O K
960 min Summer	28.509	1.509	0.0	5.9	O K
1440 min Summer	28.502	1.502	0.0	5.9	O K
2160 min Summer	28.469	1.469	0.0	5.8	O K
2880 min Summer	28.422	1.422	0.0	5.6	O K
4320 min Summer	28.318	1.318	0.0	5.2	O K
5760 min Summer	28.223	1.223	0.0	4.8	O K
7200 min Summer	28.138	1.138	0.0	4.5	O K
8640 min Summer	28.064	1.064	0.0	4.2	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	117.069	19
30 min Summer	78.692	34
60 min Summer	50.485	64
120 min Summer	31.269	124
180 min Summer	23.274	182
240 min Summer	18.738	242
360 min Summer	13.779	362
480 min Summer	11.072	482
600 min Summer	9.336	600
720 min Summer	8.117	720
960 min Summer	6.503	896
1440 min Summer	4.749	1126
2160 min Summer	3.461	1516
2880 min Summer	2.761	1932
4320 min Summer	2.005	2768
5760 min Summer	1.595	3576
7200 min Summer	1.335	4392
8640 min Summer	1.156	5192

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	27.996	0.996	0.0	3.9	O K
15 min Winter	27.619	0.619	0.0	2.4	O K
30 min Winter	27.828	0.828	0.0	3.3	O K
60 min Winter	28.052	1.052	0.0	4.1	O K
120 min Winter	28.282	1.282	0.0	5.0	O K
180 min Winter	28.408	1.408	0.0	5.5	O K
240 min Winter	28.487	1.487	0.0	5.9	O K
360 min Winter	28.589	1.589	0.0	6.3	O K
480 min Winter	28.652	1.652	0.1	6.5	O K
600 min Winter	28.690	1.690	0.1	6.7	O K
720 min Winter	28.713	1.713	0.1	6.7	O K
960 min Winter	28.730	1.730	0.1	6.8	O K
1440 min Winter	28.713	1.713	0.1	6.7	O K
2160 min Winter	28.671	1.671	0.1	6.6	O K
2880 min Winter	28.607	1.607	0.1	6.3	O K
4320 min Winter	28.460	1.460	0.0	5.7	O K
5760 min Winter	28.321	1.321	0.0	5.2	O K
7200 min Winter	28.200	1.200	0.0	4.7	O K
8640 min Winter	28.096	1.096	0.0	4.3	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	1.023	5952
15 min Winter	117.069	19
30 min Winter	78.692	33
60 min Winter	50.485	64
120 min Winter	31.269	122
180 min Winter	23.274	180
240 min Winter	18.738	238
360 min Winter	13.779	356
480 min Winter	11.072	470
600 min Winter	9.336	584
720 min Winter	8.117	696
960 min Winter	6.503	914
1440 min Winter	4.749	1156
2160 min Winter	3.461	1620
2880 min Winter	2.761	2076
4320 min Winter	2.005	2980
5760 min Winter	1.595	3856
7200 min Winter	1.335	4688
8640 min Winter	1.156	5528

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	28.002	1.002	0.0	3.9	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	1.023	6352

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time / Area Diagram

Total Area (ha) 0.010

Time (mins)	**Area (ha)**
0-4	0.010

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Model Details

Storage is Online Cover Level (m) 30.000

Lined Soakaway Structure

Infiltration Coefficient Base (m/hr)	0.01274	Ring Diameter (m)	1.50
Infiltration Coefficient Side (m/hr)	0.01274	Pit Multiplier	2.0
Safety Factor	2.0	Number Required	1
Porosity	0.30	Cap Volume Depth (m)	0.000
Invert Level (m)	27.000	Cap Infiltration Depth (m)	0.000

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Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 390 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	9.770	0.270	3.1	71.3	Flood Risk
30 min Summer	9.823	0.323	3.7	101.6	Flood Risk
60 min Summer	9.869	0.369	4.2	132.6	Flood Risk
120 min Summer	9.906	0.406	4.7	160.7	Flood Risk
180 min Summer	9.921	0.421	4.8	172.8	Flood Risk
240 min Summer	9.927	0.427	4.9	177.9	Flood Risk
360 min Summer	9.932	0.432	5.0	181.6	Flood Risk
480 min Summer	9.934	0.434	5.0	183.3	Flood Risk
600 min Summer	9.934	0.434	5.0	183.6	Flood Risk
720 min Summer	9.933	0.433	5.0	182.9	Flood Risk
960 min Summer	9.929	0.429	4.9	179.4	Flood Risk
1440 min Summer	9.916	0.416	4.8	168.8	Flood Risk
2160 min Summer	9.894	0.394	4.5	151.2	Flood Risk
2880 min Summer	9.872	0.372	4.3	135.0	Flood Risk
4320 min Summer	9.834	0.334	3.8	108.8	Flood Risk
5760 min Summer	9.803	0.303	3.5	89.4	Flood Risk
7200 min Summer	9.777	0.277	3.2	74.7	Flood Risk
8640 min Summer	9.755	0.255	2.9	63.4	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
15 min Summer	117.069	19
30 min Summer	78.692	33
60 min Summer	50.485	62
120 min Summer	31.269	122
180 min Summer	23.274	182
240 min Summer	18.738	240
360 min Summer	13.779	304
480 min Summer	11.072	366
600 min Summer	9.336	430
720 min Summer	8.117	498
960 min Summer	6.503	636
1440 min Summer	4.749	910
2160 min Summer	3.461	1316
2880 min Summer	2.761	1700
4320 min Summer	2.005	2464
5760 min Summer	1.595	3176
7200 min Summer	1.335	3896
8640 min Summer	1.156	4664

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	9.736	0.236	2.7	54.5	Flood Risk
15 min Winter	9.791	0.291	3.3	82.5	Flood Risk
30 min Winter	9.846	0.346	4.0	116.6	Flood Risk
60 min Winter	9.894	0.394	4.5	151.5	Flood Risk
120 min Winter	9.934	0.434	5.0	183.7	Flood Risk
180 min Winter	9.951	0.451	5.2	198.0	Flood Risk
240 min Winter	9.958	0.458	5.3	204.6	Flood Risk
360 min Winter	9.963	0.463	5.3	208.9	Flood Risk
480 min Winter	9.963	0.463	5.3	209.3	Flood Risk
600 min Winter	9.963	0.463	5.3	208.7	Flood Risk
720 min Winter	9.960	0.460	5.3	206.7	Flood Risk
960 min Winter	9.953	0.453	5.2	200.1	Flood Risk
1440 min Winter	9.933	0.433	5.0	182.9	Flood Risk
2160 min Winter	9.901	0.401	4.6	156.7	Flood Risk
2880 min Winter	9.871	0.371	4.3	133.9	Flood Risk
4320 min Winter	9.819	0.319	3.7	99.3	Flood Risk
5760 min Winter	9.778	0.278	3.2	75.5	Flood Risk
7200 min Winter	9.746	0.246	2.8	58.9	Flood Risk
8640 min Winter	9.720	0.220	2.5	47.0	Flood Risk

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Summer	1.023	5344
15 min Winter	117.069	19
30 min Winter	78.692	33
60 min Winter	50.485	62
120 min Winter	31.269	120
180 min Winter	23.274	176
240 min Winter	18.738	232
360 min Winter	13.779	338
480 min Winter	11.072	382
600 min Winter	9.336	458
720 min Winter	8.117	536
960 min Winter	6.503	686
1440 min Winter	4.749	982
2160 min Winter	3.461	1404
2880 min Winter	2.761	1792
4320 min Winter	2.005	2552
5760 min Winter	1.595	3288
7200 min Winter	1.335	4032
8640 min Winter	1.156	4752

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Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	9.698	0.198	2.3	38.3	O K

Storm Event	Rain (mm/hr)	Time-Peak (mins)
10080 min Winter	1.023	5448

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.200	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time / Area Diagram

Total Area (ha) 0.430

Time (mins)	**Area (ha)**
0-4	0.430

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Model Details

Storage is Online Cover Level (m) 10.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.01274	Width (m)	65.0
Membrane Percolation (mm/hr)	1000	Length (m)	65.0
Max Percolation (l/s)	1173.6	Slope (1:X)	100.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	9.500	Cap Volume Depth (m)	0.000

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Appendix 4

Cole Easdon Consultants
Unit 2, York House
Dorcan Way
Edison Park
Swindon
Wiltshire
SN3 3RB

Your Ref	SC/sc/4040sw
Our Ref	160765
Date	26 September 2013
Contact	searches@southernwater.co.uk Fax 01634 844514 DX:400450 Chatham 5

Attention: Sarah Coates

Dear Sirs

Provision of Public Sewer Main Record Extracts – VAT Receipt

Portsdown Hill, Havant, Hampshire, PO6 1BJ

Further to your recent enquiry regarding the provision of Southern Water apparatus record extracts for the above location.

Please be aware that there are areas within our region in which there are neither sewers nor water mains. Similarly, whilst the enclosed extract may indicate the approximate location of our apparatus in the area of interest, it should not be relied upon as showing that further infrastructure does not exist and may subsequently be found following site investigation. Therefore actual positions of the disclosed (and any undisclosed) infrastructure should be determined on site, because Southern Water does not accept any responsibility for inaccuracy or omission regarding the enclosed plan and accordingly it should not be considered to be a definitive document.

I confirm payment of the appropriate fee in the sum of £ **48.00**

The breakdown of costs is as follows: -

- Provision of record extracts £ 40.00
- VAT @ 20.0% £ 8.00

VAT Registration Number 543 9000 63

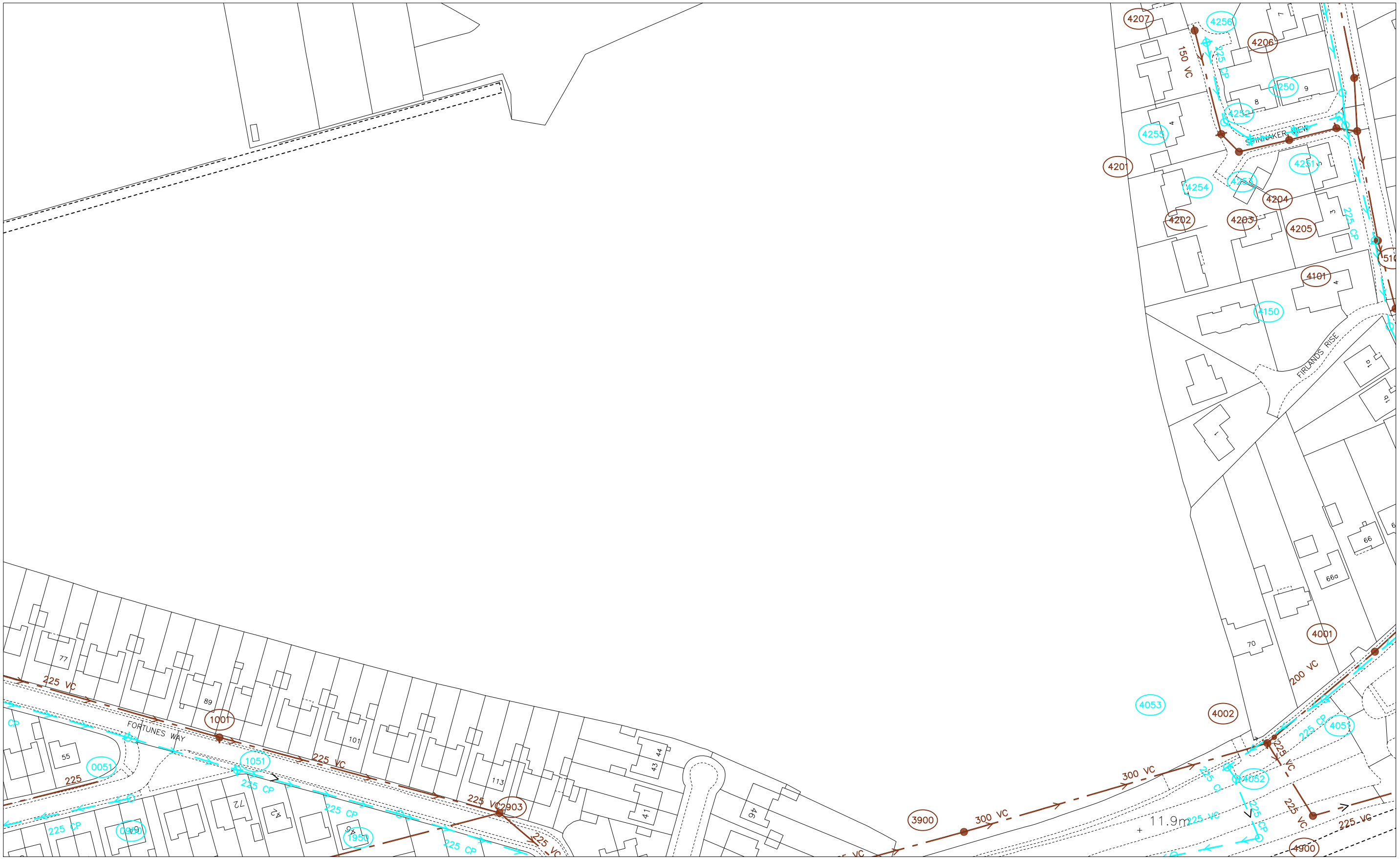
Should you require any additional information regarding this matter please contact this office at the address given at the foot of this letter.

Yours faithfully

Land Search Department

SEWER RECORDS PAGE 1 OF 2

106267



105979

469033

469506

O.S. REF.	Drawn by:	spaceyk	The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determnined on site.	N	Southern Water
SU6906SW	Scale:	1:1250	WARNING: BAC pipes are constructed of Bonded Asbestos Cement WARNING: Unknown (UNK) materials may Include Bonded Asbestos Cement		
Title: 160765_Portsdown Hill	Date:	26/09/2013	Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530.		

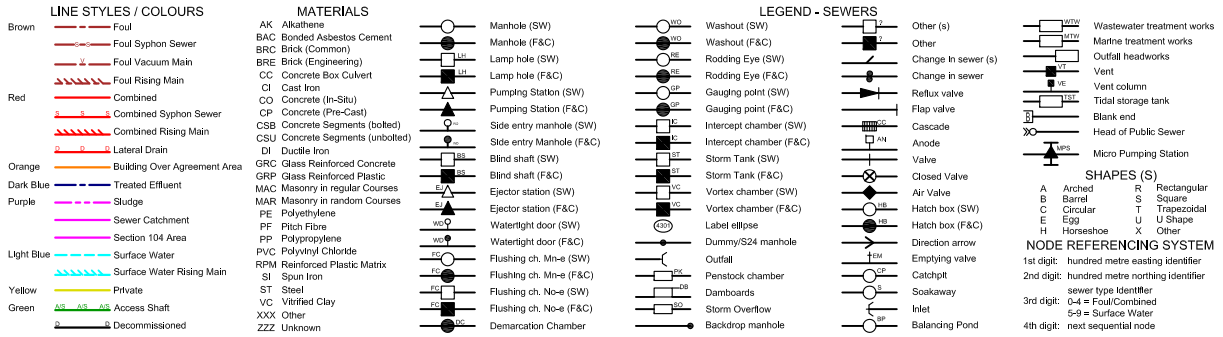
SEWER RECORDS PAGE 2 OF 2

Node	Cover	Invert	Size	Material	Shape
0051X	19.61	18.48	225	CP	CIRC
0950X			225	CP	CIRC
1001X	44.35		225	VC	CIRC
1051X	18.29		225	CP	CIRC
1950X	16.08	14.58	225	CP	CIRC
2903X	14.82		225	VC	CIRC
3900X	12.68	9.32	300	VC	CIRC
4001X	13.61		200	VC	CIRC
4002X	12.46		225	VC	CIRC
4051X	12.97	12.31	225	CP	CIRC
4052X	12.74	11.05	225	CI	CIRC
4053X	12.23	11.13	225	CI	CIRC
4101X	24.35	22.85	150	VC	CIRC
4150X	24.48	23.52	225	VC	CIRC
4201X	29.59	27.66	150	VC	CIRC
4202X	28.8	27.38	150	VC	CIRC
4203X	28.66	27.23	150	VC	CIRC
4204X	28.57	27.04	150	VC	CIRC
4205X	28.17	26.84	150	VC	CIRC
4206X	29.98	28.61	150	VC	CIRC
4207X	33.21	30.86	150	VC	CIRC
4250X	29.56	28.72	225	VC	CIRC
4251X	28.44	27.64	225	CP	CIRC
4252X	28.61	27.71	225	CP	CIRC
4253X	28.66	27.77	225	CP	CIRC
4254X	28.76	27.81	225	CP	CIRC
4255X	29.7	28.12	225	CP	CIRC
4256X	32.76	30.68	225	CP	CIRC
4900X	13.31	8.83	225	VC	CIRC
4950X	13.13	9.91	225	VC	CIRC
4951X	12.46	9.31	300	CP	CIRC
5101X	22.23	20.66	150	VC	CIRC
5151X	21.98	21.06	225	VC	CIRC

Node	Cover	Invert	Size	Material	Shape

Node	Cover	Invert	Size	Material	Shape

Node	Cover	Invert	Size	Material	Shape



Drawn by: spaceyk	Southern Water
Title: 160765_Portsdown Hill	
Date: 26/09/2013	