

APPENDICES

APPENDIX A

SERVICE CONSTRAINTS

1. This report and the site investigation carried out in connection with the report (together the "Services") were compiled and carried out by RSK Environment Limited (RSK) for Portsmouth City Council (the "Client") in accordance with the terms of a contract RSK Environment Standard Terms and Conditions between RSK and the Client. The Services were performed by RSK with the reasonable skill and care ordinarily exercised by an environmental consultant at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the Client.
2. Other than that, expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.
3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the Client. RSK is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. **Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.**
4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK 's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.
5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the Client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.
6. The observations and conclusions described in this report are based solely upon the Services which were provided pursuant to the agreement between the Client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off site of asbestos, invasive plants, electromagnetic fields, lead paint, heavy metals, radon gas, persistent, bioaccumulative or toxic chemicals (including PFAS/ PFOS) or other radioactive or hazardous materials, unless specifically identified in the Services.
7. The Services are based upon RSK's observations of existing physical conditions at the Site gained from a visual inspection of the site together with RSK's interpretation of information, including documentation, obtained from third parties and from the Client on the history and usage of the site, unless specifically identified in the Services or accreditation system (such as UKAS ISO 17020:2012 clause 7.1.6):
 - a. The Services were based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely.

- b. The Services were limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the visual inspection.
- c. The Services did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services.

RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the Client and RSK.

- 8. The intrusive environmental site investigation aspects of the Services are a limited sampling of the site at pre-determined locations based on the known historic / operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the properties of the materials adjacent and local conditions, together with the position of any current structures and underground utilities and facilities, and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters (as stipulated in the scope between the client and RSK, based on an understanding of the available operational and historical information) and it should not be inferred that other chemical species are not present.
- 9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.
- 10. The comments given in this report and the opinions expressed are based on the ground conditions encountered during the site work and on the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigation and therefore could not be taken into account. In particular, it should be noted that there may be areas of made ground not detected due to the limited nature of the investigation or the thickness and quality of made ground across the site may be variable. In addition, groundwater levels and ground gas concentrations and flows, may vary from those reported due to seasonal, or other, effects and the limitations stated in the data should be recognised.
- 11. Asbestos is often observed to be present in soils in discrete areas. Whilst asbestos-containing materials may have been locally encountered during the fieldworks or supporting laboratory analysis, the history of brownfield and demolition sites indicates that asbestos fibres may be present more widely in soils and aggregates, which could be encountered during more extensive ground works.
- 12. Unless stated otherwise, only preliminary geotechnical recommendations are presented in this report and these should be verified in a Geotechnical Design Report, once proposed construction and structural design proposals are confirmed.

APPENDIX B

SUMMARY OF LEGISLATION AND POLICY RELATING TO LAND CONTAMINATION

Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 (Part IIA) and its associated Contaminated Land Regulations 2000 (SI 2000/227), which came into force in England on 1 April 2000, formed the basis for the current regulatory framework and the statutory regime for the identification and remediation of contaminated land. Part IIA of the EPA 1990 defines contaminated land as ‘any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that significant harm is being caused, or that there is significant possibility of significant harm being caused, or that pollution of controlled waters is being or is likely to be caused’. Controlled waters are considered to include all groundwater, inland waters and estuaries.

In August 2006, the Contaminated Land (England) Regulations 2006 (SI 2006/1380) were implemented, which extended the statutory regime to include Part IIA of the EPA as originally introduced on 1 April 2000, together with changes intended chiefly to address land that is contaminated by virtue of radioactivity. These have been replaced subsequently by the Contaminated Land (England) (Amendment) Regulations 2012, which now exclude land that is contaminated by virtue of radioactivity.

The intention of Part IIA is to deal with contaminated land issues that are considered to cause significant harm on land that is not undergoing development (see Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance, April 2012). This document replaces Annex III of Defra Circular 01/2006, published in September 2006 (the remainder of this document is now obsolete).

Planning Policy

Land contamination is often addressed via the planning process during redevelopment of sites. This approach was documented in Planning Policy Statement: Planning and Pollution Control PPS23, which states that it remains the responsibility of the landowner and developer to identify land affected by contamination and carry out sufficient remediation to render the land suitable for use. PPS23 was withdrawn early in 2012 and has been replaced by much reduced guidance within the National Planning Policy Framework (NPPF), reference ISBN: 978-1-5286-1033-9, July 2021. For sites in Wales, reference should be made to Planning Policy Wales (Welsh Government. Edition 11, February 2021).

The new framework has limited guidance on contaminated land, as follows:

Chapter 11. Making effective use of land

- 117 Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or ‘brownfield’ land.

118. Planning policies and decisions should:

- c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land.

Chapter 15. Conserving and enhancing the natural environment

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

Ground conditions and pollution

178. Planning policies and decisions should ensure that:

- a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);
- b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990; and
- c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

179. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.

Water Resources Act (WRA)

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 updated the Water Resources Act 1991, which introduced the offence of causing or knowingly permitting pollution of controlled waters. The Act provides the Environment Agency with powers to implement remediation necessary to protect controlled waters and recover all reasonable costs of doing so.

Water Framework Directive (WFD)

The Water Framework Directive 2000/60/EC is designed to:

- enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands that depend on the aquatic ecosystems
- promote the sustainable use of water

- reduce pollution of water, especially by 'priority' and 'priority hazardous' substances
- ensure progressive reduction of groundwater pollution.

The WFD requires a management plan for each river basin be developed every six years.

Groundwater Directive (GWD)

The 1980 Groundwater Directive 80/68/EEC and the 2006 Groundwater Daughter Directive 2006/118/EC of the WFD are the main European legislation in place to protect groundwater. The 1980 Directive is due to be repealed in December 2013. The European legislation has been transposed into national legislation by regulations and directions to the Environment Agency.

Priority Substances Directive (PSD)

The Priority Substances Directive 2008/105/EC is a 'Daughter' Directive of the WFD, which sets out a priority list of substances posing a threat to or via the aquatic environment. The PSD establishes environmental quality standards for priority substances, which have been set at concentrations that are safe for the aquatic environment and for human health. In addition, there is a further aim of reducing (or eliminating) pollution of surface water (rivers, lakes, estuaries and coastal waters) by pollutants on the list. The WFD requires that countries establish a list of dangerous substances that are being discharged and EQS for them. In England and Wales, this list is provided in the River Basin Districts Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2010. In order to achieve the objectives of the WFD, classification schemes are used to describe where the water environment is of good quality and where it may require improvement.

Environmental Permitting Regulations (EPR)

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) provide a single regulatory framework that streamlines and integrates waste management licensing, pollution prevention and control, water discharge consenting, groundwater authorisations, and radioactive substances regulation. Schedule 22, paragraph 6 of EPR 2016 states: 'the regulator must, in exercising its relevant functions, take all necessary measures - (a) to prevent the input of any hazardous substance to groundwater; and (b) to limit the input of non-hazardous pollutants to groundwater so as to ensure that such inputs do not cause pollution of groundwater.'

Notes:

1. *The above information is provided for background but does not constitute site-specific advice*
2. *The above summary applies to England only. Variations exist within other countries of the United Kingdom*

APPENDIX C

PHOTO-PLATES

PHOTOGRAPHIC LOG

Site Location: Bunting Gardens, Waterloooville

Photo No.
1

General Site:

Looking North
from the South
of the site.



Photo No.
2

TP1:

Excavated to
2.40m bgl.

View of North
Pit face.



PHOTOGRAPHIC LOG

Site Location: Bunting Gardens, Waterloooville

Photo No.
3

TP2:
Excavated to
0.45m bgl.



Photo No.
4

TP2:
Asbestos
containing
material
identified.



PHOTOGRAPHIC LOG

Site Location: Bunting Gardens, Waterloooville

Photo No.
5

TP2a:
Excavated to
2.60m bgl.
Pit overview.



Photo No.
6

TP2a:
Pit face.



PHOTOGRAPHIC LOG

Site Location: Bunting Gardens, Waterloooville

Photo No.
7

WS1:
Completed to
5.45m bgl.



Photo No.
8

WS2:
Completed to
4.75m bgl.



PHOTOGRAPHIC LOG

Site Location: Bunting Gardens, Waterloooville

Photo No.
9

WS3:
Completed to
0.60m bgl.



Photo No.
10

WS4:
Completed to
4.45m bgl.



PHOTOGRAPHIC LOG

Site Location: Bunting Gardens, Waterloooville

Photo No.

11

WS5:

Completed to
0.80m bgl.



APPENDIX D

TECHNICAL BACKGROUND

D1 Desk Study

Aquifer designation and Source protection zones

Principal aquifer: layers of rock or drift deposit that have high intergranular and/or fracture permeability (usually providing a high level of water storage). They may support water supply and/or river base flow on a strategic scale.

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

Secondary B aquifer: predominantly lower permeability layers that may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Secondary undifferentiated aquifer: it has not been possible to attribute either a category A or B to a rock type. In most cases this means that it was previously designated as both a minor and non-aquifer in different locations owing to the variable characteristics.

Unproductive' strata: low permeability with negligible significance for water supply or river base flow.

The EA generally adopts a three-fold classification of source protection zones (SPZ) surround abstractions for public water supply. The Site is situated in an area defined as follows:

- Zone 1 or the 'inner protection zone' is located immediately adjacent to the groundwater source and is based on a 50-day travel time from any point below the water table to the source. It is designed to protect against the effects of human activity and biological/chemical contaminants that may have an immediate effect on the source
- Zone 2 or the 'outer protection zone' is defined by a 400-day travel time from a point below the water table to the source. The travel time is designed to provide delay and attenuation of slowly degrading pollutants
- Zone 3 or the 'total catchment' is the area around the source within which all groundwater recharge is presumed to be discharged at the source.

Preliminary risk assessment methodology

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. An outline conceptual model should be formed at the preliminary risk assessment stage that collates all the existing information pertaining to a site in text, tabular or diagrammatic form. The outline conceptual model identifies potentially complete (termed possible) contaminant linkages (contaminant–pathway–receptor) and is used as the basis for the design of the site investigation. The outline conceptual model is updated as further information becomes available, for example as a result of the site investigation.

Production of a conceptual model requires an assessment of risk to be made. Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the

likelihood and the consequences of an event must be taken into account when assessing risk. RSK has adopted guidance provided in CIRIA C552 for use in the production of conceptual models.

The likelihood of an event can be classified on a four-point system using the following terms and definitions based on CIRIA C552:

- highly likely: the event appears very likely in the short term and almost inevitable over the long term or there is evidence at the receptor of harm or pollution
- likely: it is probable that an event will occur or circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term
- low likelihood: circumstances are possible under which an event could occur, but it is not certain even in the long term that an event would occur and it is less likely in the short term
- unlikely: circumstances are such that it is improbable the event would occur even in the long term.

The severity can be classified using a similar system also based on CIRIA C552. The terms and definitions relating to severity are:

- severe: short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. Short-term risk to an ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000)
- medium: chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000), pollution of sensitive water resources, significant change in an ecosystem or organism forming part of that ecosystem
- mild: pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures or the environment
- minor: harm, not necessarily significant, but that could result in financial loss or expenditure to resolve. Non-permanent human health effects easily prevented by use of personal protective clothing. Easily repairable damage to buildings, structures and services.

Once the probability of an event occurring and its consequences have been classified, a risk category can be assigned according to the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very low	Very low

Definitions of these risk categories are as follows together with an assessment of the further work that may be required:

- very high: there is a high probability that severe harm could occur or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability; urgent investigation and remediation are likely to be required
- high: harm is likely to occur. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required. Remedial works may be necessary in the short term and are likely over the long term
- moderate: it is possible that harm could arise, but it is unlikely that the harm would be severe and it is more likely that the harm would be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term
- low: it is possible that harm could occur, but it is likely that if realised this harm would at worst normally be mild
- very low: there is a low possibility that harm could occur and if realised the harm is unlikely to be severe.

D2 Site Investigation Methodology

Ground gas monitoring

An infrared gas meter was used to measure gas flow, concentrations of carbon dioxide (CO₂), methane (CH₄) and oxygen (O₂) in percentage by volume, while hydrogen sulphide (H₂S) and carbon monoxide (CO) were recorded in parts per million. Initial and steady state concentrations were recorded. In addition, during the first monitoring round, all wells were screened with a PID to establish if there are any interferences and cross-sensitivity of other hydrocarbons with the infrared gas meter.

Low flow groundwater sampling

Groundwater samples were retrieved using a United States Environment Protection Agency (USEPA) approved low-flow purging and sampling methodology.

The low-flow method relies on moving groundwater through the well screen at approximately the same rate as it flows through the geological formation. This results in a significant reduction in the volume of water extracted before sampling and significantly reduces the amount of disturbance of the water in the monitoring well during purging and sampling. Drawdown levels in the monitoring well and water quality indicator parameters (pH, temperature, electrical conductivity, redox potential and dissolved oxygen) are monitored during low-flow purging and sampling, with stabilisation indicating that purging is complete and sampling can begin. As the flow rate used for purging, in most cases, is the same or only slightly higher than the flow rate used for sampling, and because purging and sampling are conducted as one continuous operation in the field, the process is referred to as low-flow purging and sampling.

Reuse of suitable materials

The Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) (CoP) was developed in consultation with the Environment Agency and development industry to enable the

re-use of materials under certain scenarios and subject to demonstrating that specific criteria are met. The current reuse scenarios covered by the CoP comprise

- reuse on the site of origin (with or without treatment)
- direct transfer of clean and natural soils between sites
- use in the development of land other than the site of origin following treatment at an authorised Hub site (including a fixed soil treatment facility).

The importation of made ground soils (irrespective of contamination status) or crushed demolition materials is not permitted currently under the CoP and requires either a standard rules environmental permit or a U1 waste exemption (see below).

In the context of excavated materials used on-sites undergoing development, four factors are considered to be of particular relevance in determining if the material is a waste or when it ceases to be waste:

- the aim of the Waste Framework Directive is not undermined, i.e. if the use of the material will create an unacceptable risk of pollution of the environment or harm to human health it is likely to be waste
- the material is certain to be used
- the material is suitable for use both chemically and geotechnically
- only the required quantity of material will be used.

The CoP requires the preparation of a materials management plan (MMP) that confirms the above factors will be met. This plan needs to be reviewed by a 'Qualified Person' (QP) who will then issue a declaration form to the EA. As the project progresses, data must be collated and on completion a verification report produced that shows the MMP was followed and describes any changes.

The MMP establishes whether specific materials are classified as waste and how excavated materials will be treated and/or reused in line with the CoP. The MMP is likely to form part of the site waste management plan.

APPENDIX E

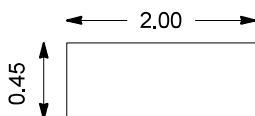
EXPLORATORY HOLE RECORDS

TRIAL PIT LOG

Contract:	Bunting Gardens		Client:	Portsmouth City Council		Trial Pit:	TP1	
Contract Ref:	305258		Start: 23.06.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	1 of 1	
			End: 23.06.22	51.98	E:468614.4 N:111725.7			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20-0.30	1	ES	T+J+V			TOPSOIL: Brown slightly clayey gravelly fine to medium SAND with frequent rootlets. Gravel is angular to subrounded fine to medium of flint.	51.88	0.10	
0.20		PID	0.0ppm			MADE GROUND: Orangish brown slightly clayey very gravelly fine to medium SAND with moderate cobble content, occasional bricks and plastics. Gravel is subangular to subrounded coarse of flint. Cobbles are subangular to subrounded of flint. Firm dark orangish brown slightly sandy gravelly CLAY with moderate cobble content. Sand is fine. Gravel is subangular to subrounded fine to coarse flint. Cobbles are subangular to subrounded of flint. (HEAD DEPOSITS) Below 1.50m bgl: occasional flint cobbles and boulders.		(0.45)	
0.20		PID	0.0ppm						
0.25-0.45	2	B							
0.40-0.50	3	ES	T+J+V				51.43	0.55	
0.55-0.65	4	B							
1.40-1.50	5	B						(1.85)	
2.30-2.40	6	B					49.58	2.40	
Trial pit completed at 2.40 m bgl.									

Plan (Not to Scale)



General Remarks

1. Position scanned with a CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

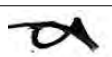
Plant Used:

JCB-3CX

Logged By:

JLilley

Checked By:

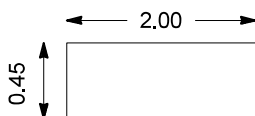



TRIAL PIT LOG

Contract: Bunting Gardens		Client: Portsmouth City Council		Trial Pit: TP2
Contract Ref: 305258	Start: 23.06.22 End: 23.06.22	Ground Level (m AOD): 52.46	National Grid Co-ordinate: E:468605.3 N:111730.1	Sheet: 1 of 1

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.30-0.40	1	D	T+J+V			TOPSOIL: Dark brown slightly gravelly slightly clayey fine to coarse SAND with frequent rootlets. Gravels are subangular to subrounded fine of flint.	52.26	0.20	
0.30-0.40	2	ES				MADE GROUND: Orangish brown slightly clayey very gravelly fine to coarse SAND with moderate cobble content and frequent plastics and possible ACM board materials. Gravel is angular to subrounded fine to coarse of flint. Cobbles are subangular to subrounded of flint. ... At 0.30m bgl: potential ACM identified. Trial pit terminated at 0.45m bgl due to presence of possible ACM.	52.01	0.45	

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit terminated at 0.45m depth upon encountering potential ACM.
5. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

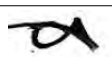
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Logged By:

JLilley

Checked By:

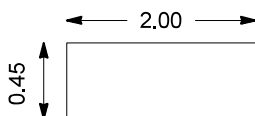


TRIAL PIT LOG

Contract:	Bunting Gardens		Client:	Portsmouth City Council		Trial Pit:	TP2a	
Contract Ref:	305258		Start: 23.06.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	1 of 1	
			End: 23.06.22	52.34	E:468604.5 N:111728.4			

Samples and In-situ Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Depth	No	Type	Results						
0.20	1	PID	0.0ppm			TOPSOIL: Dark brown slightly gravelly slightly clayey fine to coarse SAND with frequent rootlets. Gravel is angular to subrounded fine flint.	52.14	0.20	
0.30-0.40		ES	T+J+V			MADE GROUND: Orangish brown slightly clayey very gravelly fine to coarse SAND with moderate cobble content with occasional bricks, plastics and chalk fragments.. Gravel is angular to subrounded fine to coarse flint. Cobbles are subangular to subrounded of flint.	51.84	(0.30)	
0.60-0.80	2	B				Soft orangish brown slightly gravelly sandy CLAY with occasional chalk fragments. Sand is fine to medium. Gravel is subangular to subrounded fine to medium flint. (HEAD DEPOSITS)			
0.90-1.00	3	ES	T+J+V						
0.90	4	PID	0.0ppm						
1.00-1.10		D				... At 1.10m bgl: pocket of gravels in western end of trial pit.		(1.45)	
1.30-1.40	5	D							
1.40-1.50	6	B							
1.60-1.70	7	D							
1.80-1.90	8	B				... At 1.80m bgl: pocket of gravels in eastern end of trial pit.			
1.90	9	V	$c_u=66/56/72$				50.39	1.95	
1.95-2.05		D				Firm orange mottled grey slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine flint. (LAMBETH GROUP)		(0.65)	
2.20-2.30	10	B							
2.20-2.30	11	D							
2.20		V	$c_u=61/60/55$				49.74	2.60	
2.60	12	D							
2.60		V	$c_u=55/57/50$			Trial pit completed at 2.60m bgl.			

Plan (Not to Scale)



General Remarks

1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation.
2. Checks for buried ferrous objects carried out during excavation by specialist unexploded ordnance (UXO) officer using magnetometer.
3. Trial pit remained dry and stable during excavation.
4. Trial pit backfilled with arisings in reverse order upon completion.

All dimensions in metres

Scale: **1:25**

Method Used:

Machine dug

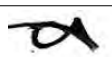
Plant Used:

JCB-3CX

Logged By:

JLilley

Checked By:




WINDOW SAMPLE LOG

Contract:	Bunting Gardens		Client:	Portsmouth City Council		Window Sample:	WS1	
Contract Ref:	305258		Start: 24.06.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	1 of 2	
			End: 24.06.22	51.11	E:468612.4 N:111710.4			

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
						TOPSOIL: Dark brown slightly clayey fine to coarse SAND with rare subangular to subrounded fine flint gravel. MADE GROUND: Orangish brown slightly clayey very gravelly fine to coarse SAND with occasional brick and plastics fragments. Gravel is subangular to subrounded coarse flint.	51.01	0.10	
	0.30-0.40 0.30	1	ES PID	T+J+V 0.0ppm				(0.90)	
	0.60-0.70	2	B						
							50.11	1.00	
	1.00-1.45	1	SPT(c)	2,2/2,2,2,2 N=8		Firm orangish brown slightly sandy gravelly CLAY with moderate cobble content. Sand is fine to medium. Gravel is angular to subrounded coarse flint. Cobbles are subangular to subrounded flint. (HEAD DEPOSITS)			
	1.20-1.30	3	D						
	1.20-1.30	4	ES PID	T+J+V 0.0ppm					
	1.20								
	1.70-1.80	5	D						
								(2.00)	
	2.00-2.45	1	SPT(c)	2,2/3,2,3,2 N=10					
	2.00-2.20	6	D						
	2.50-2.60	7	D						
							48.11	3.00	
	3.00-3.45	1	SPT	2,2/3,4,3,4 N=14		Firm orangish brown mottled grey slightly gravelly sandy CLAY with low cobble content. Sand is fine to medium. Gravel is subangular to subrounded fine flint. Cobbles are subangular to subrounded of flint. (LAMBETH GROUP)			
	3.00-3.10	8	D						
	3.40-3.50	9	D						
	4.00-4.45	1	SPT	2,2/4,3,4,5 N=16					
	4.00-4.10	10	D					(2.45)	
	4.30-4.40	11	D						

Drilling Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			
						- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Inspection pit hand dug to 1.2m depth. - UXO specialist present during drilling to undertake magnetometer scanning at 1m depth intervals within borehole. - Groundwater not observed during drilling. 50mm diameter gas/groundwater monitoring well complete with flush protective		
						All dimensions in metres	Scale:	1:25
Method Used:	Tracked window sampling			Plant Used:	Premier 110	Drilled By:	Oakland SI	Logged By: JLilley Checked By:  AGS

WINDOW SAMPLE LOG

Contract: Bunting Gardens			Client: Portsmouth City Council		Window Sample: WS1
Contract Ref: 305258	Start: 24.06.22 End: 24.06.22	Ground Level (m AOD): 51.11	National Grid Co-ordinate: E:468612.4 N:111710.4		Sheet: 2 of 2

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	4.60-4.70	12	D				Firm orangish brown mottled grey slightly gravelly sandy CLAY with low cobble content. Sand is fine to medium. Gravel is subangular to subrounded fine flint. Cobbles are subangular to subrounded of flint. (LAMBETH GROUP) (stratum copied from 3.00m from previous sheet)			
	4.90-5.00	13	D							
	5.00-5.45	1	SPT	2,2/2,3,3,3 N=11				45.66	5.45	
							Borehole completed at 5.45m bgl.			

Drilling Progress and Water Observations						General Remarks			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	cover installed to 5.00m depth on completion. Response zone 1.00m to 5.00m depth.			
						All dimensions in metres		Scale:	1:25
Method Used:	Tracked window sampling			Plant Used:	Premier 110	Drilled By:	Oakland SI	Logged By:	JLilley
								Checked By:	 AGS

WINDOW SAMPLE LOG

Contract: Bunting Gardens			Client: Portsmouth City Council		Window Sample: WS2
Contract Ref: 305258	Start: 24.06.22 End: 24.06.22	Ground Level (m AOD): 51.38	National Grid Co-ordinate: E:468606.9 N:111708.1		Sheet: 1 of 2

Progress	Samples / Tests				Water	Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.20-0.30 0.20	WS2	ES PID	T+J+V 0.0ppm			TOPSOIL: Dark brown slightly clayey fine to coarse SAND with rare subangular to subrounded fine flint gravel and frequent rootlets. MADE GROUND: Orangish brown slightly clayey very gravelly fine to coarse SAND with occasional brick and plastic fragments. Gravel is subangular to subrounded coarse flint. Medium dense orangish brown slightly clayey gravelly fine to coarse SAND with moderate cobble content. Gravel is angular to subrounded fine to coarse flint. Cobbles are subangular to subrounded of flint. (HEAD DEPOSITS)	51.28	0.10	
								50.98	0.40	
	1.00-1.45 1.00	1	SPT(c) PID	1,2/3,2,3,3 N=11 0.1ppm					(0.80)	
	1.50-1.60 1.60-1.70	WS2	B D					50.18	1.20	
									(1.20)	
	2.00-2.45 2.20-2.30	1	SPT D	1,2/1,5,7,8 N=21						
		WS2	D					48.98	2.40	
	2.70-2.80	WS2	D				Orangish yellow slightly clayey medium to coarse SAND with rare subangular to subrounded fine flint gravel. (HEAD DEPOSITS)		(0.40)	
								48.58	2.80	
	3.00-3.45 3.10-3.20 3.20	1	SPT D V	2,4/4,5,6,8 N=23 $c_u=55/56/76$			Stiff orange mottled yellowish red sandy CLAY with rare subangular to subrounded fine flint gravels. Sand is fine to coarse. (LAMBETH GROUP)			
	3.50-3.60 3.50-3.60	WS2	D B						(1.95)	
	4.00-4.45	1	SPT	5,7/9,12,11,12 N=44						
	4.30-4.75	1	SPT	4,7/11,12,15,16 N=54						

Drilling Progress and Water Observations						General Remarks								
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)									
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.20m depth. 3. UXO specialist present during drilling to undertake magnetometer scanning at 1m depth intervals within borehole. 4. No groundwater observed. 5. Borehole terminated at 4.60m bgl due to refusal.								
						All dimensions in metres	Scale: 1:25							
Method Used:	Tracked window sampling			Plant Used:	Premier 110		Drilled By:	Oakland SI		Logged By:	JLilley	Checked By:		

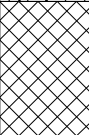
Contract:		Client:		Window Sample:
Bunting Gardens		Portsmouth City Council		WS2
Contract Ref:	Start: 24.06.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
305258	End: 24.06.22	51.38	E:468606.9 N:111708.1	2 of 2

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
						6. 50mm diameter gas/groundwater monitoring well complete with flush protective cover installed to 4.00m depth on completion. Response zone 2.00m to 4.00m depth.
All dimensions in metres						Scale: 1:25
Method Used:	Tracked window sampling		Plant Used:	Premier 110		Drilled By: Oakland SI Logged By: JLilley Checked By:  AGS

WINDOW SAMPLE LOG

Contract: Bunting Gardens		Client: Portsmouth City Council		Window Sample: WS3
Contract Ref: 305258	Start: 24.06.22 End: 24.06.22	Ground Level (m AOD): 52.17	National Grid Co-ordinate: E:468610.2 N:111728.1	Sheet: 1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.30-0.40 0.30	WS3	ES PID	T+J+V 0.0ppm			TOPSOIL: Dark brown slightly clayey fine to medium SAND with rare angular to subrounded fine flint gravel and frequent rootlets. MADE GROUND: Light brown slightly clayey very gravelly fine to medium SAND with high cobble content and occasional brick and plastic fragments.. Gravel is subangular to subrounded coarse of flint. Cobbles are subangular to subrounded flint. Hand pit terminated at 0.60m bgl due to highly compacted material.	52.02 51.57	0.15 (0.45) 0.60	 

Drilling Progress and Water Observations						General Remarks				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	- Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. - Hand pit terminated at 0.60m bgl due to highly compacted material. - No groundwater observed. - Borehole backfilled with arisings.				
All dimensions in metres						Scale:	1:25			
Method Used:	Tracked window sampling			Plant Used:	Premier 110		Drilled By:	Oakland SI	Logged By: JLilley Checked By: 	

WINDOW SAMPLE LOG

Contract:	Bunting Gardens		Client:	Portsmouth City Council		Window Sample:	WS4	
Contract Ref:	305258	Start: 24.06.22	Ground Level (m AOD):	52.09	National Grid Co-ordinate:	E:468603.6 N:111721.3	Sheet:	1 of 2
		End: 24.06.22						

Progress	Samples / Tests				Water Backfill & Instrumentation	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results					
	0.20-0.30 0.20	WS4	ES PID	T+J+V 0.0ppm		TOPSOIL: Dark brown slightly clayey fine to medium SAND with rare angular to subrounded fine flint gravel and frequent rootlets.	51.89	0.20	
						MADE GROUND: Light brown slightly clayey very gravelly fine to medium SAND with high cobble content and occasional brick and plastic fragments. Gravel is subangular to subrounded coarse of flint. Cobbles are subangular to subrounded flint.	51.59	(0.30) 0.50	
	0.70-0.80	WS4	B			Medium dense dark orangish brown slightly clayey very gravelly fine to medium SAND with occasional cobbles. Gravel is angular to subrounded coarse flint. Cobbles are subangular to subrounded flint. (HEAD DEPOSITS)		(1.10)	
	1.00-1.45 1.00	1	SPT(c) PID	1,2/3,2,3,3 N=11 0.0ppm					
	1.50-1.60 1.60	WS4	B PID	0.0ppm			50.49	1.60	
	1.70-1.80	WS4	ES	T+J+V		Firm orangish brown slightly sandy gravelly CLAY with low cobble content. Sand is fine. Gravel is angular to subrounded coarse flint. Cobbles are subrounded of flint. (HEAD DEPOSITS)		(1.20)	
	2.00-2.45	1	SPT	1,4/5,4,4,3 N=16					
	2.40-2.50	WS4	D						
	2.80-2.90	WS4	D			 At 2.70m bgl: very gravelly flint pocket.	49.29	2.80	
	3.00-3.45	1	SPT	2,3/4,5,5,7 N=21		Stiff orange mottled grey and red sandy CLAY with rare angular to subrounded fine flint gravel. Sand is fine to medium. (LAMBETH GROUP)		(1.65)	
	3.20-3.30 3.20	WS4	D V	c _u =47/50/45					
	3.60-3.70 3.70	WS4	D V	c _u =65/75/59		 At 3.50m bgl: grey clayey sand lense.			
	3.90-4.00 4.00-4.45	WS4 1	D SPT	2,2/3,5,7,10 N=25					
							47.64	4.45	

Borehole completed at 4.45m bgl.

Drilling Progress and Water Observations						General Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Inspection pit hand dug to 1.2m depth. 3. UXO specialist present during drilling to undertake magnetometer scanning at 1m depth intervals within borehole. 4. Groundwater not observed during drilling. 5. 50mm diameter gas/groundwater monitoring well complete with flush protective		
All dimensions in metres						Scale:	1:25	
Method Used:	Tracked window sampling			Plant Used:	Premier 110	Drilled By:	Oakland SI	Logged By: JLilley
						Checked By:		

Contract:		Client:		Window Sample:
Bunting Gardens		Portsmouth City Council		WS4
Contract Ref:	Start: 24.06.22	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:
305258	End: 24.06.22	52.09	E:468603.6 N:111721.3	2 of 2

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Drilling Progress and Water Observations						General Remarks
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
						cover installed to 4.00m depth on completion. Response zone 1.00m to 4.00m depth.
All dimensions in metres						Scale: 1:25
Method Used:	Tracked window sampling		Plant Used:	Premier 110		Drilled By: Oakland SI Logged By: JLilley Checked By:  AGS

WINDOW SAMPLE LOG

Contract: Bunting Gardens		Client: Portsmouth City Council		Window Sample: WS5
Contract Ref: 305258	Start: 24.06.22 End: 24.06.22	Ground Level (m AOD): 51.62	National Grid Co-ordinate: E:468614.7 N:111721.4	Sheet: 1 of 1

Progress	Samples / Tests				Water	Backfill	Description of Strata	Reduced Level	Depth (Thickness)	Material Graphic Legend
Window Run	Depth	No	Type	Results						
	0.20-0.30 0.20	1	ES PID	T+J+V 0.0ppm			TOPSOIL: Dark brown slightly clayey fine to medium SAND with rare angular to subrounded fine flint gravel and frequent rootlets. MADE GROUND: Light brown slightly clayey very gravelly fine to medium SAND with high cobble content and occasional brick and plastic fragments. Gravel is subangular to subrounded coarse su flint. Cobbles are subangular to subrounded flint.	51.42	0.20	
	0.60-0.70 0.60-0.70 0.60	1 2	B ES PID	T+J+V 0.0ppm			Orangish brown slightly clayey gravelly fine to coarse SAND with high cobble content. Gravel is angular to subrounded fine to coarse flint. Cobbles are subangular to subrounded of flint. (HEAD DEPOSITS) Hand pit terminated at 0.80m bgl due to highly compacted material.	51.02 50.82	(0.40) 0.60 0.80	

Drilling Progress and Water Observations						General Remarks	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		
						1. Position checked with Ground Penetrating Radar, CAT and Genny prior to excavation. 2. Hand pit terminated at 0.80m bgl due to highly compacted material. 3. No groundwater observed. 4. Borehole backfilled with arrisings.	
All dimensions in metres						Scale:	1:25
Method Used:	Tracked window sampling			Plant Used:	Premier 110		Drilled By: Oakland SI Logged By: JLilley Checked By: 

APPENDIX F

SOIL INFILTRATION CERTIFICATES

Project Name: Bunting Gardens, Waterloooville

Project No.: 305258

Tested by:
JL

Location: Bunting Gardens, Waterloooville, PO8 9UW

Co-ords: E:468614.3657
N:111725.6878
Level: 51.9833 AOD

Inputed by:
JL

Client: Portsmouth City Council

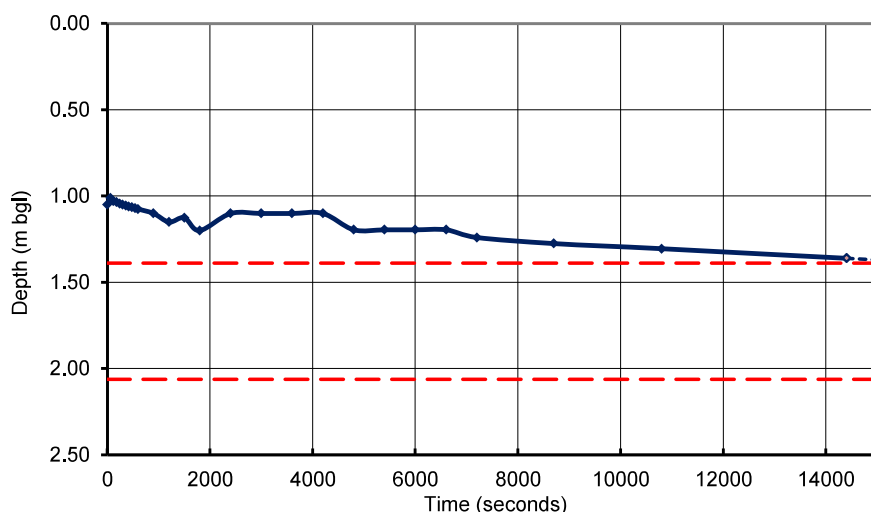
Checked by:
CA

Test: 1 Date: 14/03/2022

Length: 2.00 m
Width: 0.45 m
Depth: 2.40 m
GW Level: dry m
WT Level: 1.05 m
Backfilled: No
Porosity: N/A %

Vp 75-25 = 0.61 m³
as 50 = 4.21 m²
tp 75-25 = 45691 sec

Infiltration rate f = 3.16E-06 m/s

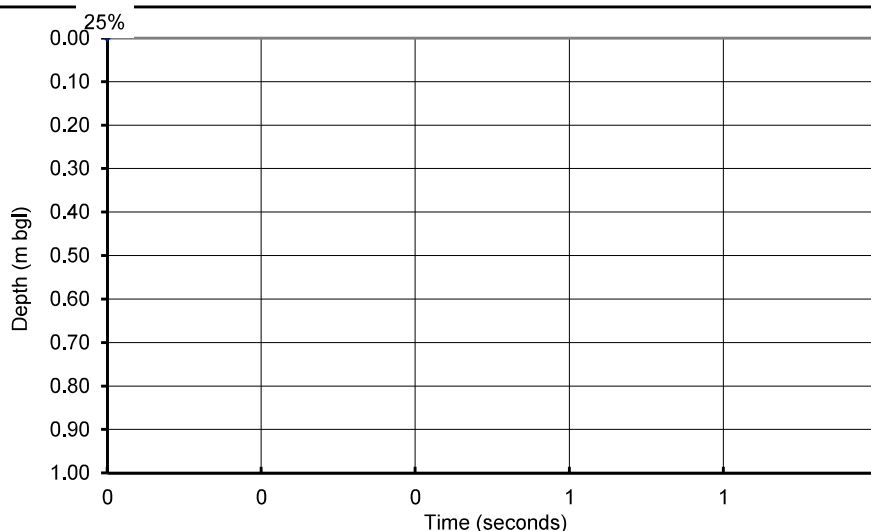


Test: 2 Date: 15/03/2022

Length: m
Width: m
Depth: m
GW Level: m
WT Level: m
Backfilled: No
Porosity: N/A %

Vp 75-25 = m³
as 50 = m²
tp 75-25 = sec

Infiltration rate f = m/s

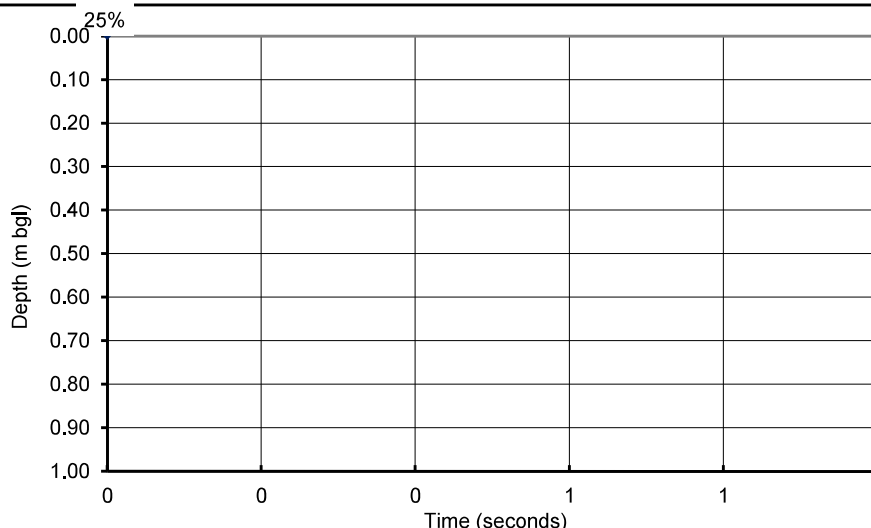


Test: 3 Date: 15/03/2022

Length: m
Width: m
Depth: m
GW Level: m
WT Level: m
Backfilled: No
Porosity: N/A %

Vp 75-25 = m³
as 50 = m²
tp 75-25 = sec

Infiltration rate f = m/s



Remarks:

Response zone: 1.00 - 2.50m bgl

Fill rate of 237.5L in 30 seconds. Fill Time: Test 1 = 4min, Test 2 = 3min, Test 3 = 5mins.

> Draining quickly as filling: In Test 1 used 1900L to reach 1.70m bgl, In Test 2 used 1750L to reach 1.65m bgl and In

Project Name: Bunting Gardens, Waterloooville

Project No.: 305258

Tested by:
JL

Location: Bunting Gardens, Waterloooville, PO8 9UW

Co-ords: E:468604.5081
N:111728.3753
Level: 52.3379 AOD

Inputed by:
JL

Client: Portsmouth City Council

Checked by:
CA

Test: 1 Date: 14/03/2022

Length: 2.50 m

Width: 0.45 m

Depth: 2.60 m

GW Level: dry m

WT Level: 1.55 m

Backfilled: No

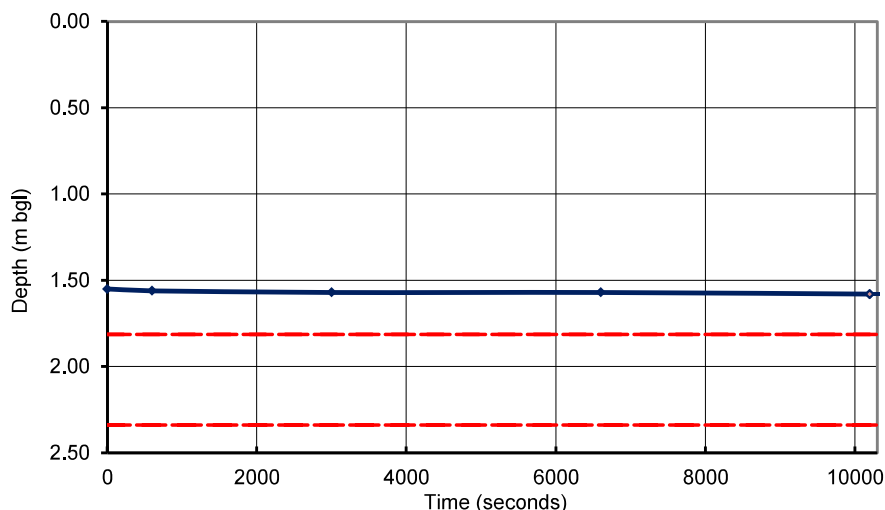
Porosity: N/A %

Vp 75-25 = 0.59 m³

as 50 = 4.22 m²

tp 75-25 = 271199 sec

Infiltration rate f = 5.16E-07 m/s



Test: 2 Date: 15/03/2022

Length: m

Width: m

Depth: m

GW Level: m

WT Level: m

Backfilled: No

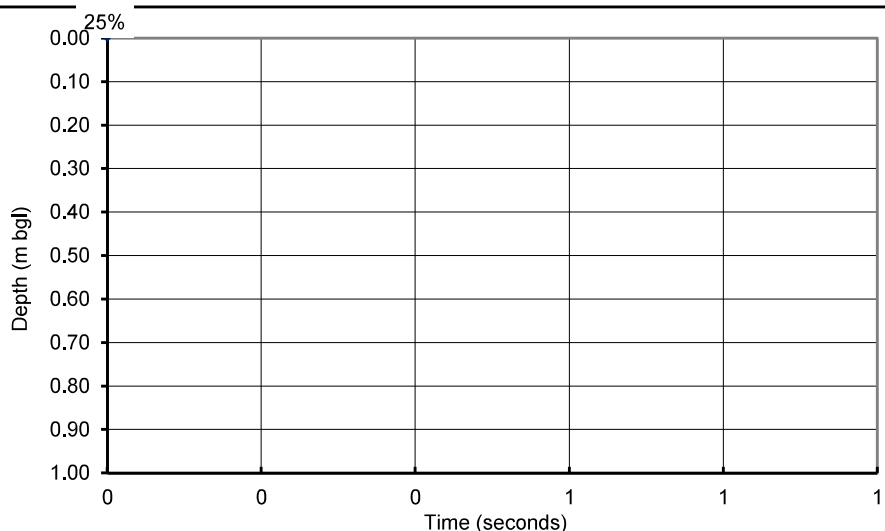
Porosity: N/A %

Vp 75-25 = m³

as 50 = m²

tp 75-25 = sec

Infiltration rate f = m/s



Test: 3 Date: 15/03/2022

Length: m

Width: m

Depth: m

GW Level: m

WT Level: m

Backfilled: No

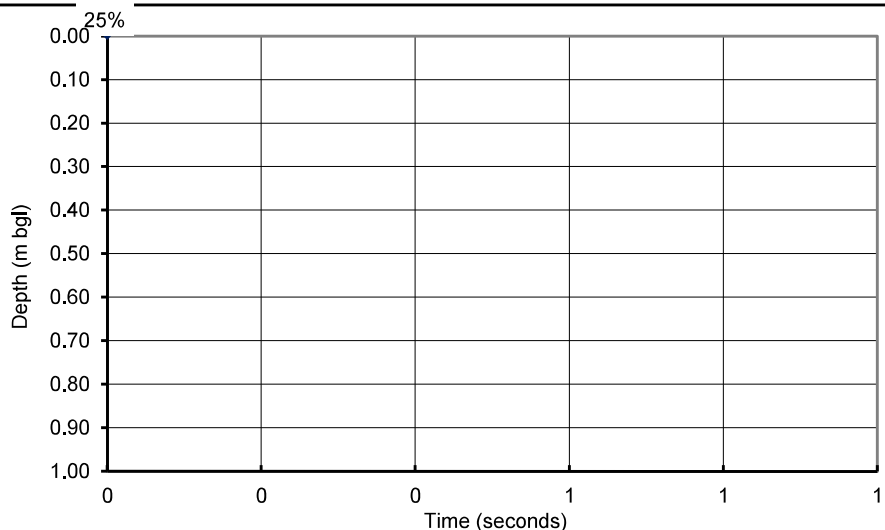
Porosity: N/A %

Vp 75-25 = m³

as 50 = m²

tp 75-25 = sec

Infiltration rate f = m/s



Remarks:

Response zone: 1.00 - 2.50m bgl

Fill rate of 237.5L in 30 seconds. Fill Time: Test 1 = 4min, Test 2 = 3min, Test 3 = 5mins.

> Draining quickly as filling: In Test 1 used 1900L to reach 1.70m bgl, In Test 2 used 1750L to reach 1.65m bgl and In