Appendix D

GROUND INVESTIGATIONS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Carters Barn
Sherrington
Wiltshire
BA12 0SN
Tel: 01985 850882

14 September 2018

Your ref:
Planning ref:
Our ref: J16123/DB/c03

Malcolm Westcott
BDW Southampton
Tollbar House
Tollbar Way
Hedge End
Southampton
Hampshire
SO30 2UH

Dear Mr Westcott,

RE: LAND NORTH OF BARNHAM ROAD, EASTERGATE, WEST SUSSEX

PRELIMIANRY DUE DILLIGENCE DESK STUDY AND GROUND INVESTIGATION LETTER REPORT

Further to instruction from BDW Southampton, we have carried out an initial phase of due diligence desk study and ground investigation that has included a site walkover, review of statutory environmental databases, review of historical mapping records and a limited scope intrusive investigation within accessible parts of this site.

The results of the exploratory boreholes together with the soil test results and site plan indicating the locations of the exploratory boreholes are enclosed with this letter report and the findings of these works are discussed below in accordance with our normal terms, limitations and conditions of contract.

Development Proposals
Consideration is being given to the development of this greenfield site through the construction of a residential housing scheme comprising a range of predominantly two storey traditional residential housing together with access roads, hard standing for car parking, communal soft landscaping and areas of private domestic garden, although detailed layout and design proposals are not currently available. As part of this residential development it is understood that there is an obligation to construct or contribute to the construction of a new section of bypass that will be formed at the northern and eastern boundary of the site.

Scope of Work
A site walkover survey, pre-purchase desk study and pre-purchase ground investigation has been carried out to provide information to assist with the preliminary concept design of foundations, floor slabs, road pavements and drainage strategy, and to facilitate inspection of soils and recovery of a samples for laboratory geotechnical and contaminated land testing.

In accordance with current best practice the desk study has been used to guide the scope of the ground investigation and the findings of both the desk study and the ground investigation have been used to formulate a conceptual model for the site and facilitate a preliminary qualitative risk assessment. This assessment has been used as the basis of a discussion of the implications of any identified issues of potential concern with regards to ground contamination in order to determine the requirement for further assessment or remedial action as part of the redevelopment of this site for residential purposes.

An initial phase of ground investigation was carried out in 2017 to install a series of water monitoring standpipes in locations across the site in order to facilitate winter water level monitoring during the winter of 2017/2018.

The subsequent phase of ground investigation carried out in summer 2018 comprised a series of 18 small diameter boreholes drilled to depths of up to 4.45 m in selected representative locations across the accessible parts of the main residential development area. A further series of 11 small diameter boreholes were drilled at approximate 100m centres along the proposed bypass route.

A further series of water and soil gas monitoring boreholes were installed as part of this second phase of works and repairs were carried out to the initial monitoring standpipes which had become damaged during the past year.

It is proposed that monitoring of all standpipes will be carried out during the winter of 2018/2019 and reported as an addendum to this report.

Site Description

The site comprises an irregularly shaped parcel of land that comprises predominantly open agricultural land in the eastern part and predominantly densely overgrown woodland and former orchards within the western part. The site has approximate maximum dimensions of 900m by 400m and is sensibly level with a change in elevation of less than about 4m across the entire site.

The eastern part of the site is currently lain to grass and used as grazing and for growing silage and hay crops. The western part of the site is currently overgrown and locally very overgrown with dense scrub vegetation and woodland with the remains of mature orchard trees and planted wind break tree belts and hedges. The northern boundary to the site is formed by further areas of open agricultural land and houses to the east and areas of densely overgrown orchards to the west. The western site boundary is formed by the extent of adjoining land ownership, gardens to houses fronting onto Fontwell Avenue to the west and other areas of densely overgrown vegetation. The southern boundary to the site is formed by the extent of further areas of land ownership and the extent of gardens to houses fronting onto Barnham Lane to the south, together with a small industrial estate accessed off Barnham Road which forms the eastern part of the southern boundary. Vehicular access to the site is currently provided through this industrial estate and through adjoining land to the north accessed from Eastergate Lane.

Site History and Environmental Site Setting Summary

A review of available historical maps indicates that the site has not been previously developed and has been in use as open agricultural land since at least 1896, the date of the first map studied. During the post-war period, the site is shown to have been bisected by a network of tracks and to have been planted with rows of orchard trees, although by 1970 these are no longer marked as being present.

Information provided by the British Geological Survey indicates the site to be underlain by River Terrace Deposits and Raised Beach Deposits overlying clay soils of the London Clay Formation. Information provided by the Environment Agency indicates the site and the surrounding area to be underlain by a Secondary 'A' Superficial Aquifer but that the site is not shown to be located within the source protection zone of any registered abstraction wells.

Data searches indicate the site to be located within an area of concern with regards to the potential ingress of Radon gas at 1-3% of homes being affected, although detailed enquiries indicate that, there is not a requirement for radon protection to proposed new buildings at this site.

Preliminary Conceptual Site Model Summary and Risk Assessment
The historical use of the site as open agricultural land is not considered to be of concern with regards to potential ground contamination although the use as a commercial orchard could present the potential historical use of a wide range of chemicals such as pesticides and herbicides. Whilst the majority of these chemicals are not biologically persistent in the open environment, there is a perhaps limited potential for some relic pesticide and herbicide contamination at this site. The site is located remove from any farm yards or agricultural centres, such that risk of other contaminants associated with the refueling, repair and servicing of agricultural equipment is considered negligible.

Ground Investigation Sampling Strategy
The ground investigation has comprised a series of small diameter boreholes drilled across the site to depths of up to 4.45 m below ground level. The locations of the boreholes have been selected to provide an acceptable pre-purchase coverage of the site together, including the installation of combined soil gas and groundwater monitoring standpipes along field boundaries where they do not present an obstackel or risk to the ongoing agricultural use of the site.

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. Soil samples were screened for the presence of VOCs by means of headspace testing using a PID. Following headspace screening, samples for soil contamination testing were placed into appropriate brown glass jars with Teflon coated lids that were provided by the MCERTS accredited soils testing laboratory before being placed into a chilled cool box for courier collection and transportation directly to the testing laboratory.

For this investigation the analytical suite of testing was selected to comprise routine metallic contaminants, polyaromatic hydrocarbons (PAHs) speciated hydrocarbons (TPH CWG) and screening for the presence of asbestos carried out as part of the second phase of investigation.

Ground Conditions
The ground conditions have been found to comprise a variable depth of topsoil underlain by a soft Brickearth silty clay with occasional to abundant flint gravel and occasional cobbles has been encountered to depths of between 1.10 m and 2.20 m below ground level.

Beneath these clay soils a variable chalk derived Raised Beach Deposit has been encountered comprising an initially pale brown and brown becoming pale brown and off white silty sand and sandy silt with variable flint gravel, chalk fragments and occasional flint cobbles. These soils locally graded into a pale brown and brown off white silty sandy flint gravel with variable chalk fragments. These granular soils were proved to the maximum depth of investigation with no indications of the anticipated underlying London Clay encountered as part of this ground investigation.

Groundwater was encountered in each exploratory hole at depths of between about 2.50 m and 3.00 m below ground level in the majority of the boreholes, although it is important to note that these boreholes were drilled in the peak of an exceptionally prolonged dry period during one of the hottest summers on record in England, so may not be representative of more normal groundwater conditions.

No visual or olfactory indications of ground contamination where noted as part of the ground investigation works. Selected soil samples were recovered from the near surface soils and topsoil and submitted for laboratory testing at an independent MCERTS accredited laboratory. The results of the soil contamination testing are enclosed together with the records of the exploratory holes and a site plan.

Groundwater Winter Water Level Monitoring
The records of the winter water monitoring programme carried out during the winter of 2017 / 2018 are presented below;

Date	BH No M1 (12.0 mOD)	BH No M2 (11.8 mOD)	BH No M3 (12.7 mOD)	BH No M4 (13.3 mOD)	BH No M5 (14.1 mOD)
15/10/2016	1.98 m bgl (10.02mOD)	1.81 m bgl (9.99mOD)	2.12 m bgl (10.58mOD)	1.88 m bgl (11.42mOD)	1.93 m bgl (12.17mOD)
26/11/2016	1.78 m bgl (10.22mOD)	1.73 m bgl (10.07mOD)	2.05 m bgl (10.65mOD)	1.49 m bgl (11.81mOD)	1.62 m bgl (12.48mOD)
15/12/2016	1.55 m bgl (10.45mOD)	1.52 m bgl (10.28mOD)	1.68 m bgl (11.02mOD)	1.23 m bgl (12.07mOD)	1.46 m bgl (12.64mOD)
20/01/2017	1.65 m bgl (10.35mOD)	1.49 m bgl (10.31mOD)	1.52 m bgl (11.18mOD)	1.02 m bgl (12.28mOD)	1.52 m bgl (12.58mOD)
26/02/2017	1.95m bgl (10.05mOD)	1.67 m bgl (10.13mOD)	1.83 m bgl (10.87mOD)	1.11 m bgl (12.19mOD)	1.61 m bgl (12.49mOD)
16/03/2017	2.18 m bgl (9.82mOD)	2.20 m bgl (9.60mOD)	2.35 m bgl (10.35mOD)	1.95 m bgl (11.35mOD)	1.85 m bgl (12.35mOD)

Further monitoring of these original monitoring standpipes and the subsequently installed additional monitoring standpipes will be carried out during the forthcoming winter of 2018/2019.

Soil Gas Monitoring
Limited soil gas monitoring carried out to date has not indicated any elevated concentrations of potentially hazardous or noxious soil gasses.

Foundation Design Discussion
In areas remote from trees it is anticipated that spread foundations may be generally viable, although there is a risk that during winter months or during prolonged period of heavy rainfall that may occur during the traditionally wetter times of the year, groundwater could be encountered in foundation excavations.

In the vicinity of trees it is anticipated that piled foundations may provide a more sensible foundation approach as a results of the effects of trees upon the near surface clay soils which would render them unsuitable to support spread foundations. Deepened spread foundations extending to the underlying granular soils could be considered at depths of up to about 2.50 m below ground level, although in winter moths these are likely to be below the depth of groundwater and therefore not practical as a foundation solution.

Where viable, spread foundations formed within the soft to firm clay soils may be designed on the basis of a preliminary assumed net allowable bearing capacity of 75 kPa, whilst within the underlying net allowable medium dense sand and gravel soils a preliminary assumed net allowable bearing capacity of 125 kPa with a minimum foundation width of 0.60 m. . In the unlikely event that large or closely spaced foundations are required, additional settlement analyses should be carried out to check anticipated settlements remain within normally tolerable limits.

These preliminary bearing capacities include a suitable factor of safety to help ensure that anticipated settlements remain within normally acceptable limits, although these will need to be reviewed in the light of subsequent more detailed ground investigation necessary in due course to support the detailed design of foundations at this site.

Road Pavement Design
MEXE cone assessment of CBR values has been carried out and indicates a low CBR value of between about 3% is provided by the existing soils at this site below the near surface desiccated soils.

Insitu CBR testing has been carried out, although the results are considered to be excessively high and affected by the deep desiccation identified as part of the site works and as such are not considered representative of the true equilibrium conditions.

Laboratory soaked CBR testing has been carried out on selected soil samples and indicate a CBR value of up to 5% may be achievable.

Surface Water Management Strategy
Falling head testing has been carried out in a number of the boreholes and it is proposed to carry out further falling head testing within boreholes as part of the winter water level monitoring proposed for the winter of 2018/2019.

Preliminary results indicate infiltration rates in the order of 103-6m/s within the granular soils underlying the near surface clay soils that are assumed to have a negligible permeability. It is important to note however that soakaways formed into the granular soils at depth could result in a direct discharge of surface water to saturated soils during the winter months, which may not be an acceptable condition

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
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 significance of the measured concentrations of any chemicals of concern has been assessed in relation to the available C4SLs for a residential with plant uptake end use, together with the revised and updated S4ULs that have been adopted by the Chartered Institute of Environmental Health (CIEH). 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 ground contamination has not been identified. Screening for the presence of asbestos has also not indicated the presence of detectable fibres.

Testing of selected samples for a range of pesticides and herbicides has also not indicated the presence of detectable concentrations.

Contaminated Land Discussion
The current and historical use of the site as open agricultural land is not considered to pose a risk of ground contamination. The historical use of the site as an orchard presents the potential of relic pesticide and herbicide contamination, although through soil analyses this potential risk may be discounted.

The ground investigation has not identified any visual or olfactory indications of ground contaminants and elevated concentrations of a wide range of potential soil contaminants have not been detected within the selected representative soil samples recovered from the site.

As with any site however, there remains a perhaps limited potential for localized contaminants to be present at this site and as such it is 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 perhaps limited 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[1] and CIRIA[2] and the requirements of the Local Authority Environmental Health Officer (EHO).

Waste Disposal
On the basis of the laboratory testing it is anticipated that the arisings of made ground and underlying natural superficial soils would be classified as Inert Waste, although confirmatory WAC testing may be required by hauliers and licensed landfill operators once the works are underway.

It is considered that providing it can be appropriately segregated as part of the initial site strip the topsoil recovered from site should be suitable for reuse on site.

Further Work
Further monitoring of the groundwater during the coming winter of 2018/2019 is strongly recommended in order to inform the assessment of the site.

Once the detailed design proposals have been progressed, further phase specific ground investigation will be required to provide a sufficiently comprehensive coverage of the site and to inform the detailed design of foundations and the site drainage strategy.

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

Yours sincerely
Wilson Bailey Partnership

Dominic Brightman
BSc MSc DIC FGS CGeol ARSM
Encs

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

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

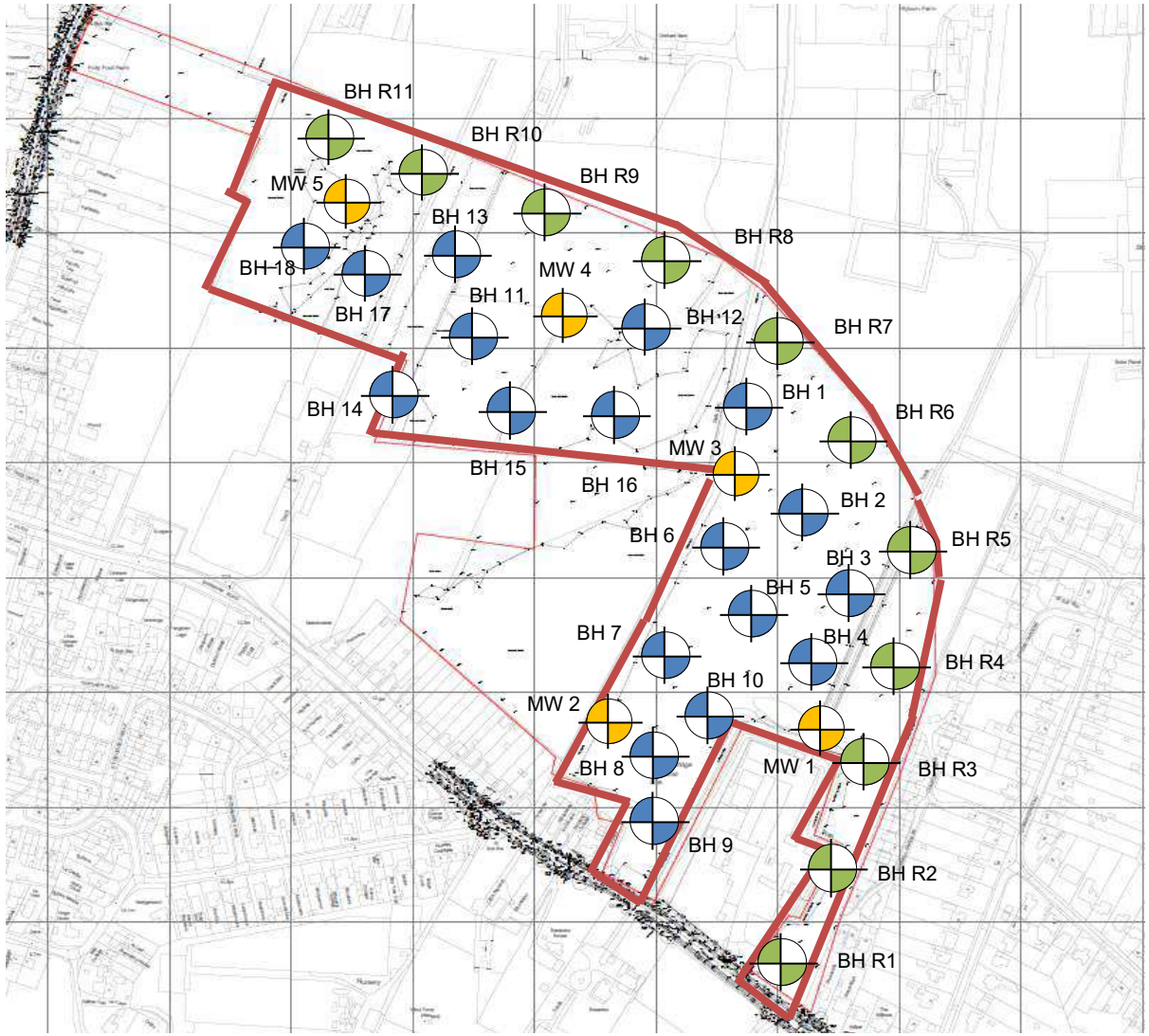
WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Carters Barn
Sherrington
Wiltshire
BA12 0SN

Site Plan

Site Eastergate Site, Barnham, Chichester, West Sussex

Client BDW Southampton



Mini-tracked drilling rig

Boreholes drilled along the proposed road corridor

Boreholes drilled across the main residential development area

previous monitoring well locations that were monitored during winter of 2017/2018 - subsequently repaired following damage

0 100 200 300

Approximate Scale in metres

SITE PLAN

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH1
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.40			TOPSOIL
		0.50	D					Orange-brown and dark orange-brown silty sandy very clayey fine to medium flint GRAVEL
		1.00	D		1.20			
		1.50	D					Brown silty clayey sandy fine to medium coarse flint GRAVEL
		2.00	D					
		2.50	D					
		3.00	D					
	▼				3.30			
		3.50	D					Pale brown and off white very silty sandy clayey fine to medium GRAVEL with layers of soft pale yellowish brown off white and pale grey very silty sandy clay
		4.00	D					
		4.50	D					
		5.00	D		5.00			End of Borehole at 5.00m

Remarks
Groundwater encountered at 3.30m.

AGS

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Borehole Log

Borehole No.
BH10
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.45			TOPSOIL
		1.00	D					Firm brown slightly silty sandy CLAY with occasional fine flint gravel
		1.00	SPT	N=7 (1,1/1,2,2,2)				
		1.50	D					
		2.00	D		1.95			Pale yellowish brown and off white sandy SILT with abundant fine to medium chalk gravel and scattered becoming abundant fine to medium flint gravel
		2.00	SPT	N=40 (5,10/10,10,10,10)				
		2.50	D					
▼		3.00	D					
		3.00	SPT	N=9 (2,4/3,2,2,2)				
		3.50	D		3.50			Pale brown silty sandy clayey fine to medium flint GRAVEL
		4.00	D		4.00			End of Borehole at 4.00m
		4.00	SPT	N=19 (3,3/4,4,5,6)				

Remarks
Groundwater encountered at 3.00m.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH11
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.30			TOPSOIL
		0.50	D					Firm brown and dark orange-brown silty sandy CLAY with occasional becoming abundant fine to medium flint gravel
		1.00	D					
		1.50	D					
	▼	2.00	D		1.90			Pale off white very sandy SILT with abundant free white chalk gravel and scattered fine to medium flint gravel *Poor recovery 2.00m to 3.00m.*
					3.00			End of Borehole at 3.00m

Remarks
Groundwater encountered at 2.00m. Poor recovery 2.00m to 3.00m.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH12
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.40			TOPSOIL
		0.50			0.80			"Stiff" brown and dark brown silty CLAY with scattered fine to medium flint gravel - desiccated
		1.00	D		1.10			Brown and dark brown silty sandy clayey fine to medium flint GRAVEL
		1.50	D					Pale yellowish brown and off white sandy SILT with abundant fine white chalk gravel and scattered fine to medium flint gravel and occasional cobbles
		2.00	D					
		2.50	D					
	▼	3.00	D					
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered at 3.00m.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH13
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:	Hole Type WLS
Location:	Barnham. West Sussex		Level:	Scale 1:50
Client:	BDW Southampton		Dates: 03/07/2018	Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.25			TOPSOIL
		0.50	D					Firm brown and dark orange-brown silty sandy CLAY with scattered fine to medium flint gravel
		1.00	D		1.10			
		1.50	D					Orange-brown an dark brown silty sandy clayey fine to medium flint GRAVEL
		2.00	D					
		2.50	D		2.40			Off white silty SAND with abundant white fine to medium chalk gravel and abundant fine to medium flint gravel
		3.00	D		3.00			End of Borehole at 3.00m

Remarks
Groundwater not encountered.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH14
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.40			TOPSOIL
		0.50	D					Firm brown silty CLAY with occasional becoming abundant fine to medium flint gravel
		1.00	D					
		1.50	D					
		2.00	D		2.00			Off white and pale yellowish brown sandy SILT with abundant fine white chalk gravel and scattered fine to medium flint gravel
	▼							*Poor recovery 2.50m to 4.00m*
					4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered. at 2.80m. Poor recovery 2.50m to 4.00m.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH15
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.30			TOPSOIL
		0.50	D					Firm brown and dark orange-brown silty sandy CLAY
		1.00	D		0.90			Brown and dark orange-brown silty sandy clayey fine to medium flint GRAVEL with occasional flint cobbles
		1.50	D					
		2.00	D		1.80			Pale off white and yellowish brown sandy SILT with abundant fine white chalk gravel and abundant fine to medium flint gravel and occasional flint cobbles
	▼	2.50	D					
		3.00	D					
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered at 2.80m.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH16
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.45			TOPSOIL
					0.70			Firm dark orange-brown and brown silty CLAY with occasional rootlets and fine flint gravel
		1.00	D					Dark orange-brown silty sandy clayey fine to medium flint GRAVEL with occasional flint cobbles
		1.50	D		1.30			Brown and off white silty locally clayey SAND with abundant fine to medium white chalk gravel and abundant fine to medium flint gravel and occasional flint cobbles
		2.00	D					
		2.50	D					
		3.00	D					
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater not encountered.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH17
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.30			TOPSOIL
		0.50	D					Firm brown and dark orange-brown silty CLAY
		1.00	D		0.90			
		1.00	SPT	N=27 (1,2/7,4,8,8)				Medium dense dark orange-brown and brown silty sandy clayey fine to medium flint GRAVEL
		1.50	D		1.50			
		2.00	D					Pale yellowish brown and off white sandy SILT with abundant fine chalk gravel and occasional locally abundant fine to medium flint gravel and occasional flint cobbles
		2.00	SPT	N=17 (3,4/4,4,4,5)				
	▼	2.50	D					
		3.00	D					
		3.00	SPT	N=33 (2,3/7,10,9,7)				
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered at 2.80m.

AGS

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GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH18
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 03/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.30			TOPSOIL
		0.50	D					Firm brown and dark orange-brown silty sandy CLAY
		1.00	D		1.10			Brown and dark orange-brown silty sandy clayey fine to medium flint GRAVEL
		1.50	D		1.60			Off white and pale yellowish brown silty SAND with abundant white fine chalk gravel, abundant fine to medium flint gravel and occasional flint cobbles
		2.00	D					
		2.50	D					
	▼	3.00	D					
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered at 3.20m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH2
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.30			TOPSOIL
		0.50	D					Firm dark orange-brown silty slightly sandy CLAY with occasional fine to medium flint gravel
		1.00	D					
		1.00	SPT	N=12 (3,4/4,3,2,3)	1.10			
		1.50	D					Pale yellowish brown and off white very silty very sandy locally slightly clayey fine to medium flint GRAVEL
					1.80			
		2.00	D					Dark orange-brown and brown silty sandy locally clayey fine to medium flint GRAVEL
	▼	2.00	SPT	N=12 (4,4/4,4,2,2)	2.30			
		2.50	D					Pale brown and pale yellowish brown locally off white very silty SAND in abundant fine flint chalk gravel
		3.00	D					
		3.00	SPT	N=23 (4,5/6,5,6,6)				
		3.50	D					
		4.00	D		4.00			
		4.00	SPT	N=36 (4,7/8,9,10,9)				End of Borehole at 4.00m

Remarks
Groundwater encountered at 2.30m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH3
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:	Hole Type WLS
Location:	Barnham. West Sussex		Level:	Scale 1:50
Client:	BDW Southampton		Dates: 02/07/2018	Logged By

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			TOPSOIL
		0.50	D					Firm pale yellowish brown silty slightly sandy CLAY
		1.00	D					
					1.30			
		1.50	D					Pale yellowish brown and off white locally brown and orange-brown silty very sandy locally silty clayey fine to medium coarse flint GRAVEL
	▼	2.00	D					
		2.50	D					
		3.00	D					
					3.20			
		3.50	D					Pale yellowish brown and off white silty SAND with scattered fine to medium flint gravel
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered at 2.00m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH4
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.40			TOPSOIL
		1.00	D					"Stiff" brown slightly silty slightly sandy CLAY with occasional becoming abundant fine to medium flint gravel - desiccated
		1.00	SPT	N=8 (2,2/2,2,2,2)				
		1.50	D		1.70			Pale yellowish brown and off white silty SAND with abundant fine to medium flint and chalk gravel
	▼	2.00	D					
	▼	2.00	SPT	N=6 (1,1/1,1,2,2)				
		2.50	D					
		3.00			3.00			End of Borehole at 3.00m
		3.00	SPT	N=12 (3,3/3,3,3,3)				

Remarks
Groundwater encountered at 2.30m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH5
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.40			TOPSOIL
		1.00	D					Firm orange-brown silty sandy CLAY with scattered flint gravel
		1.00	SPT	N=11 (1,1/2,3,3,3)				
		1.50	D		1.30			Off white and pale yellowish brown silty locally clayey SAND with abundant fine chalk gravel and locally abundant and scattered fine to medium flint gravel
		2.00	D					
		2.00	SPT	N=23 (6,6/5,6,5,7)				
		2.50	D					
	▼	3.00	D					
		3.00	SPT	N=13 (2,3/3,4,3,3)				
		3.50	D					
		4.00	D		4.00			End of Borehole at 4.00m
		4.00	SPT	N=18 (3,4/4,4,5,5)				

Remarks
Groundwater encountered at 3.00m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH6
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30			TOPSOIL
		0.50	D					Firm dark orange-brown and brown silty locally sandy CLAY with scattered flint gravel
		1.00	D					
		1.00	SPT	N=7 (2,2/2,1,2,2)				
		1.50	D		1.40			Pale yellowish brown / off white silty SAND with abundant fine chalk gravel and scattered fine to medium flint gravel
		2.00	D					
		2.00	SPT	N=21 (5,5/5,5,6,5)				
		2.50	D					
	▼	3.00	D					
		3.00	SPT	N=19 (4,4/4,5,6,4)				
		3.50	D		3.50			Yellowish brown silty sandy CLAY with scattered flint and calk gravel
		4.00	D		4.00			End of Borehole at 4.00m
		4.00	SPT	N=10 (2,2/3,2,2,3)				
		5.00	SPT	N=14 (4,3/4,3,4,3)				

Remarks
Groundwater encountered at 3.10m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH7
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.45			MADE GROUND (reworked topsoil with occasional tile fragments)
		1.00	D		0.85			Firm brown and dark orange-brown silty slightly sandy CLAY
		1.00	SPT	N=14 (2,2/2,4,4,4)				Firm brown and dark brown silty sandy CLAY with abundant fine to medium flint gravel
		1.50	D		1.40			Pale yellowish brown and off white silty SAND with abundant flint and chalk gravel
		2.00	D					
		2.00	SPT	N=27 (5,7/7,8,7,5)				
		2.50	D					
	▼	3.00	D					
		3.00	SPT	N=9 (2,2/3,2,2,2)				
		3.50	D		3.30			Firm yellowish silty sandy CLAY with abundant fine chalk gravel and scattered fine to medium flint gravel
		4.00	D		4.00			End of Borehole at 4.00m
		4.00	SPT	N=21 (4,3/5,5,5,6)				

Remarks
Groundwater encountered at 3.00m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH8
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.35			TOPSOIL
		0.50	D					Firm dark orange-brown silty sandy CLAY
		1.00	D					
		1.50	D		1.50			Firm dark brown and brown silty sandy CLAY with abundant fine to medium flint gravel
		2.00	D					
		2.50	D		2.20			Off white and yellowish brown silty SAND with abundant fine chalk gravel and abundant fine to medium flint gravel with occasional soft clayey layers
	▼	3.00	D					
		3.40	D					
		4.00	D		4.00			End of Borehole at 4.00m

Remarks
Groundwater encountered at 3.00m.

AGS

WILSON BAILEY
GEOTECHNICAL & ENVIRONMENTAL

Borehole Log

Borehole No.
BH9
Sheet 1 of 1

Project Name:	Eastergate Development Site Residential Site	Project No. J18025	Co-ords:
Location:	Barnham. West Sussex		Level:
Client:	BDW Southampton		Dates: 02/07/2018

Hole Type: WLS
Scale: 1:50
Logged By:

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.50	D		0.40			TOPSOIL
		1.00	D					Firm brown silty sandy CLAY with scattered fine to medium flint gravel
		1.00	SPT	N=4 (1,0/1,1,1,1)				
		1.50	D		1.40			Firm brown silty sandy CLAY with abundant fine to medium flint gravel
	▼	2.00	D					
		2.00	SPT	N=8 (1,1/2,2,2,2)	2.20			Off white and pale yellowish brown silty SAND with abundant chalk gravel and scattered but locally abundant fine to medium flint grave;
		2.50	D					
		3.00	D					
		3.00	SPT	N=9 (2,2/2,2,2,3)				
		3.50	D					
		4.00			4.00			End of Borehole at 4.00m
		4.00	SPT	N=13 (2,3/3,3,3,4)				

Remarks
Groundwater encountered at 2.00m

AGS

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
24894	Eastergate	Samples received	06/07/2018
		Schedule received	20/07/2018
Project No.	Client	Project started	20/07/2018
K4-	Wilson Bailey	Testing Started	03/09/2018

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%	%	%	%	
BH1	-	1.00	-	D	Brown silty very gravelly CLAY with traces of rootlets (gravel is fmc and angular to sub-angular)	11	39	57	23	34	Sample washed to obtain test fraction
BH2	-	1.00	-	D	Dark brown slightly gravelly silty CLAY with traces of carbonaceous deposits (gravel is fm and sub-angular)	23	87	45	20	25	
BH3	-	1.00	-	D	Brown slightly sandy silty CLAY with dark grey carbonaceous deposits and rare fine sub-angular fine gravel	20	99	46	19	27	
BH4	-	1.00	-	D	Redish brown silty slightly sandy gravelly CLAY with traces of rootlets (gravel is fmc and angular to sub-angular)	19	62	44	21	23	
BH5	-	1.00	-	D	Reddish brown slightly sandy silty CLAY with traces of rootlets and rare fine gravel	21	95	39	19	20	
BH6	-	1.00	-	D	Reddsih brown slightly sandy silty CLAY with rare fine gravel.	20	96	41	21	20	
BH7	-	1.00	-	D	Reddish brown gravelly slightly sandy silty CLAY with scattered calcaeous deposits (gravel is fmc and angular to sub-angular)	18	33	50	21	29	
BH8	-	1.00	-	D	Reddish brown slightly gravelly slightly sandy silty CLAY with traces of black flecks (gravel is fm and sub-angular)	21	98	40	19	21	
BH11	-	1.00	-	D	Reddsh brown slightly gravelly slightly sandy silty CLAY (gravel is fm and sub-angular)	22	96	40	19	21	
BH17	-	1.00	-	D	Reddish brown gravelly slightly sandy silty CLAY with traces of calcareous deposits (gravel is fmc and angular to sub-angular)	19	41	49	23	26	Sample washed to obtain test fraction
BH18	-	1.00	-	D	Brown slightly gravelly fine sandy silty CLAY with occasional rootlets (gravel is fm and sub-angular)	15	97	36	20	16	
BHR1	-	1.00	-	D	Reddish brown slightly sandy silty CLAY with dark grey carbonaceous stains and occasional rootlets	22	100	47	21	26	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0

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

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Email: James@k4soils.com

Checked and Approved
Initials K.P
Date: 13/09/2018

Summary of Natural Moisture Content, Liquid Limit and Plastic Limit Results

Job No.	Project Name	Programme	
24894	Eastergate	Samples received	06/07/2018
		Schedule received	20/07/2018
Project No.	Client	Project started	20/07/2018
K4-	Wilson Bailey	Testing Started	03/09/2018

Hole No.	Sample				Soil Description	NMC	Passing 425µm	LL	PL	PI	Remarks
	Ref	Top m	Base m	Type		%	%	%	%	%	
BHR2	-	1.00	-	D	Reddish brown slightly sandy silty CLAY with rare fine sub-angular gravel	21	99	39	19	20	
BHR3	-	1.00	-	D	Reddish brown slightly gravelly slightly sandy silty CLAY with occasional roots (gravel is fm and sub-angular)	21	93	43	19	24	
BHR4	-	1.00	-	D	Brown gravelly sandy silty CLAY with occasional roots and rootlets (gravel is fmc and angular to sub-angular)	1.6	31	56	21	35	
BHR6	-	0.50	-	D	Greyish brown gravelly slightly sandy silty CLAY with occasional rootlets (gravel is fmc and sub-angular)	11	35	36	20	16	Sample washed to obtain test fraction
BHR6	-	1.00	-	D	Pale reddish brown sandy gravelly silty calcareous CLAY with occasional rootlets (gravel is fmc and sub-angular to sub-rounded flint)	13	40	22	15	7	
BHR8	-	1.00	-	D	Brown sandy gravelly CLAY with occasional roots and rootlets (gravel is fmc and sub-angular to sub-rounded)	9.8	50	39	21	18	
BHR9	-	1.00	-	D	Reddish brown slightly sandy silty CLAY with rare fine gravel	22	100	44	18	26	

Test Methods: BS1377: Part 2: 1990:
Natural Moisture Content : clause 3.2
Atterberg Limits: clause 4.3 and 5.0

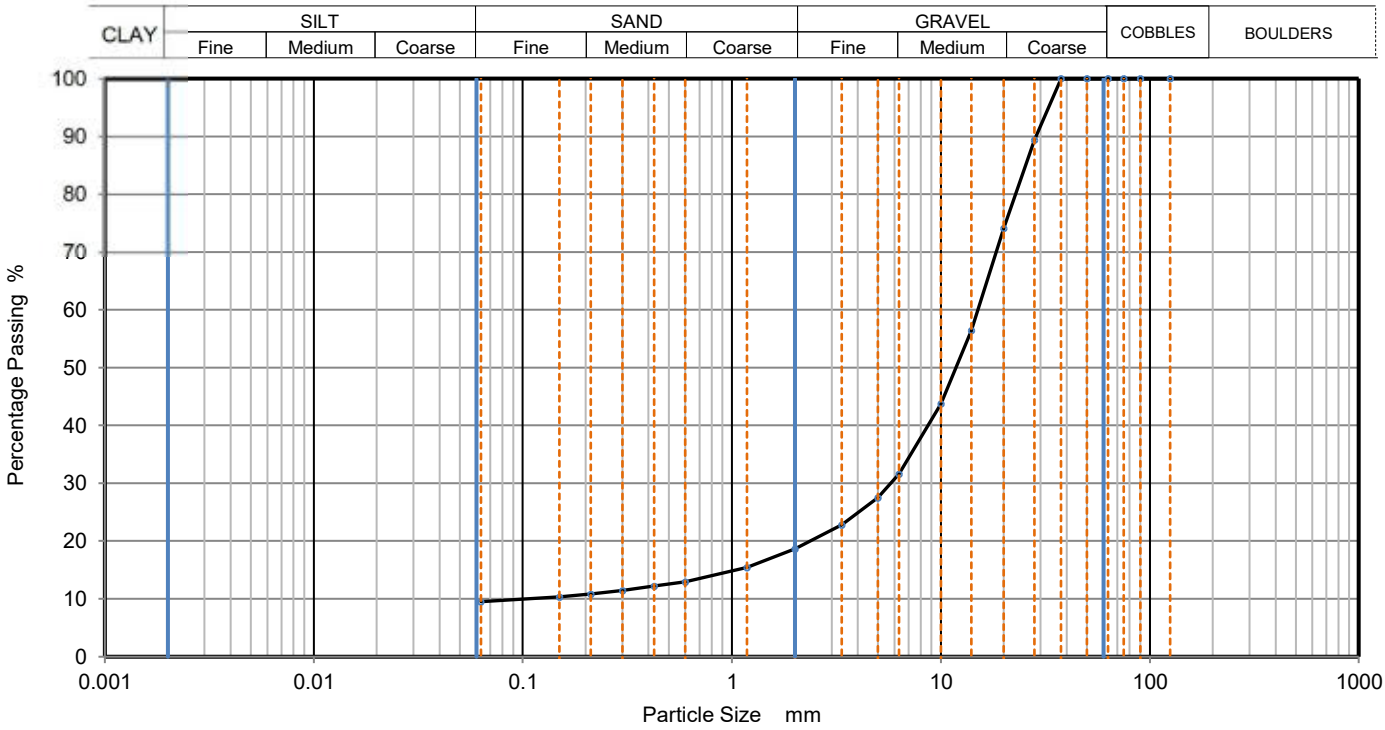
Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved
Initials K.P
Date: 13/09/2018

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Sample No.	-
Project No.	K4-	Client	Wilson Bailey	Depth Top	2.00 m
Soil Description	Dark reddish brown and pale grey clayey sandy GRAVEL (gravel is fmc and sub-angular flint)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/08/2018
Job Ref	24894				
Borehole/Pit No.	BH1				



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	89		
20	74		
14	56		
10	44		
6.3	32		
5	28		
3.35	23		
2	19		
1.18	15		
0.6	13		
0.425	12		
0.3	11		
0.212	11		
0.15	10		
0.063	10		

Dry Mass of sample, g	1943

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	81.4
Sand	9.1
Fines <0.063mm	9.5

Grading Analysis		
D100	mm	
D60	mm	15.1
D30	mm	5.75
D10	mm	0.108
Uniformity Coefficient		140
Curvature Coefficient		20

Remarks

Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory

Unit 8, Olds Close, Watford, Herts, WD18 9RU

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Tel: 01923 711288

Checked and Approved

Initials: **K.P**

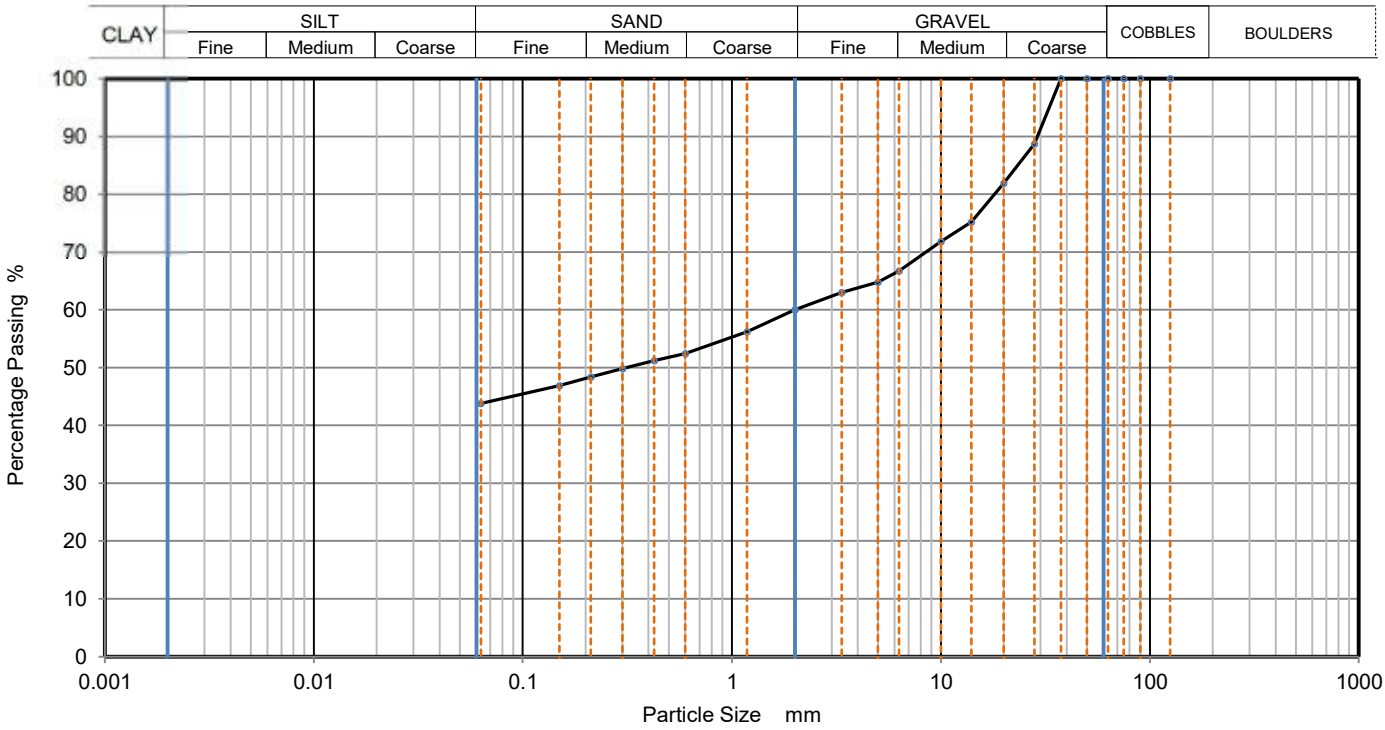
Date: 13/09/2018

UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH2
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	1.50 m
Soil Description	Pale greyish brown gravelly sandy silty calcareous CLAY (gravel is fmc and sub-angular to sub-rounded)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/09/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	89		
20	82		
14	75		
10	72		
6.3	67		
5	65		
3.35	63		
2	60		
1.18	56		
0.6	52		
0.425	51		
0.3	50		
0.212	48		
0.15	47		
0.063	44		

Dry Mass of sample, g	607

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	40.0
Sand	16.2
Fines <0.063mm	43.8

Grading Analysis		
D100	mm	
D60	mm	2.01
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory

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Tel: 01923 711288

Checked and Approved

Initials: **K.P**

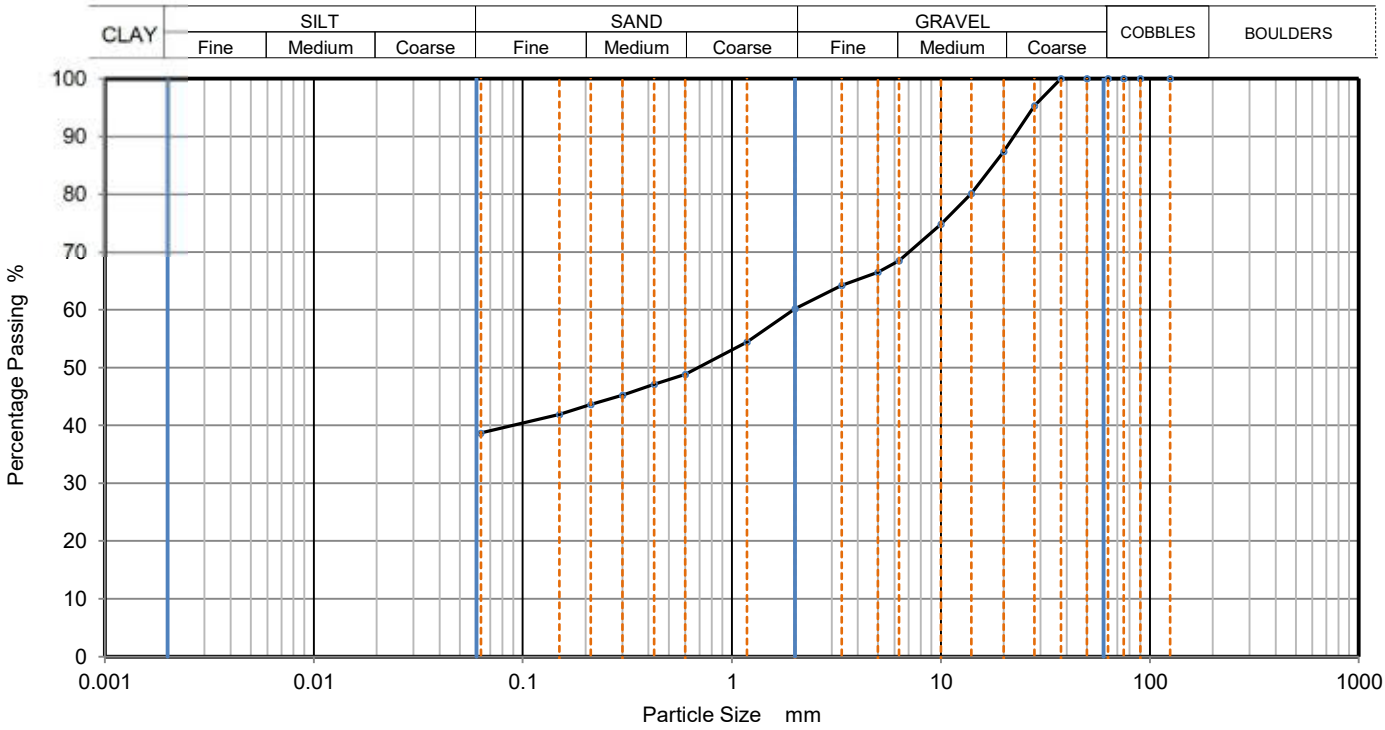
Date: 13/09/2018

UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH5
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pale greyish brown gravelly sandy silty calcareous CLAY with occasional chalk deposits (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	01/08/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	87		
14	80		
10	75		
6.3	69		
5	67		
3.35	64		
2	60		
1.18	54		
0.6	49		
0.425	47		
0.3	45		
0.212	44		
0.15	42		
0.063	39		

Dry Mass of sample, g	735

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	39.8
Sand	21.5
Fines <0.063mm	38.8

Grading Analysis		
D100	mm	
D60	mm	1.96
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory

Unit 8, Olds Close, Watford, Herts, WD18 9RU

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Checked and Approved

Initials: **K.P**

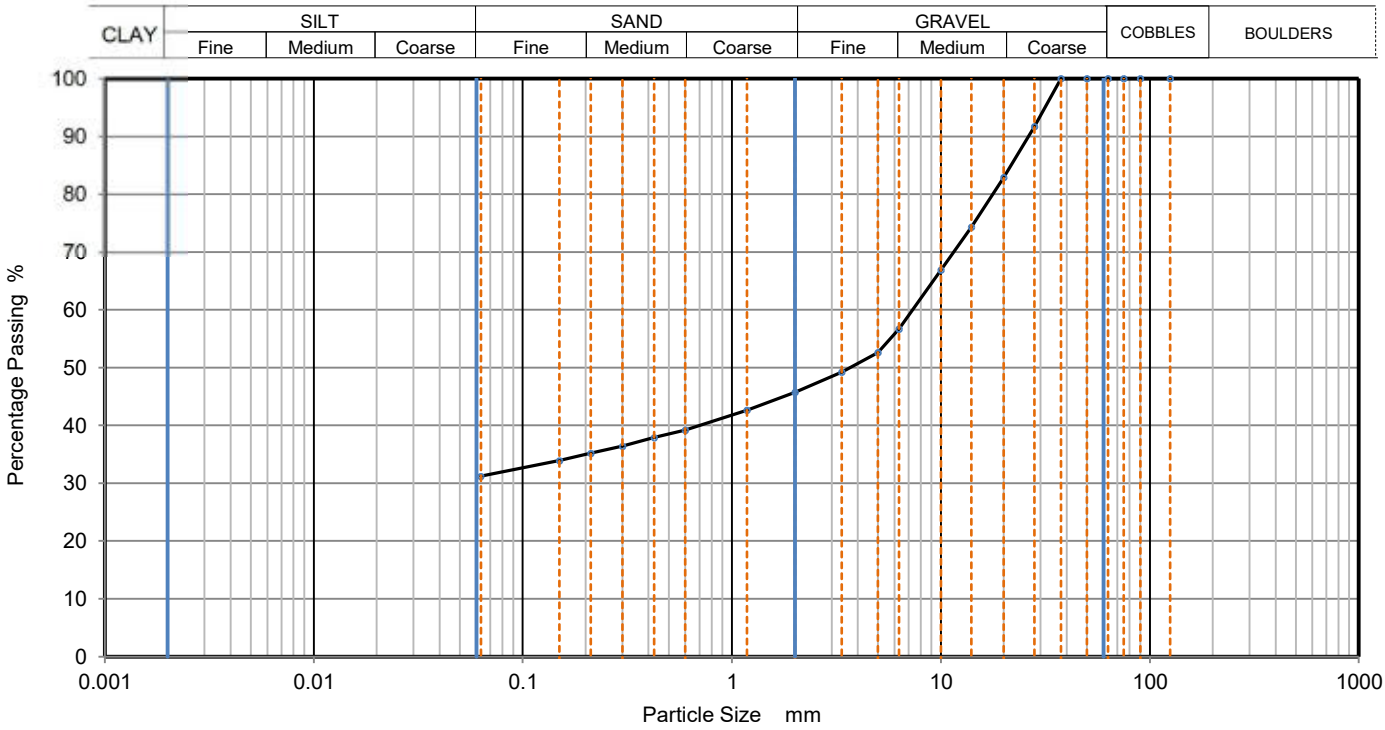
Date: 13/09/2018

UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Sample No.	-
Project No.	K4-	Client	Wilson Bailey	Depth Top	3.00 m
Soil Description	Off white and pale grey calcareous very clayey sandy GRAVEL (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/09/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	83		
14	74		
10	67		
6.3	57		
5	53		
3.35	49		
2	46		
1.18	43		
0.6	39		
0.425	38		
0.3	36		
0.212	35		
0.15	34		
0.063	31		

Dry Mass of sample, g	795

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	54.3
Sand	14.5
Fines <0.063mm	31.2

Grading Analysis		
D100	mm	
D60	mm	7.31
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory

Unit 8, Olds Close, Watford, Herts, WD18 9RU

Email: james@k4soils.com

Tel: 01923 711288

Checked and Approved

Initials: **K.P**

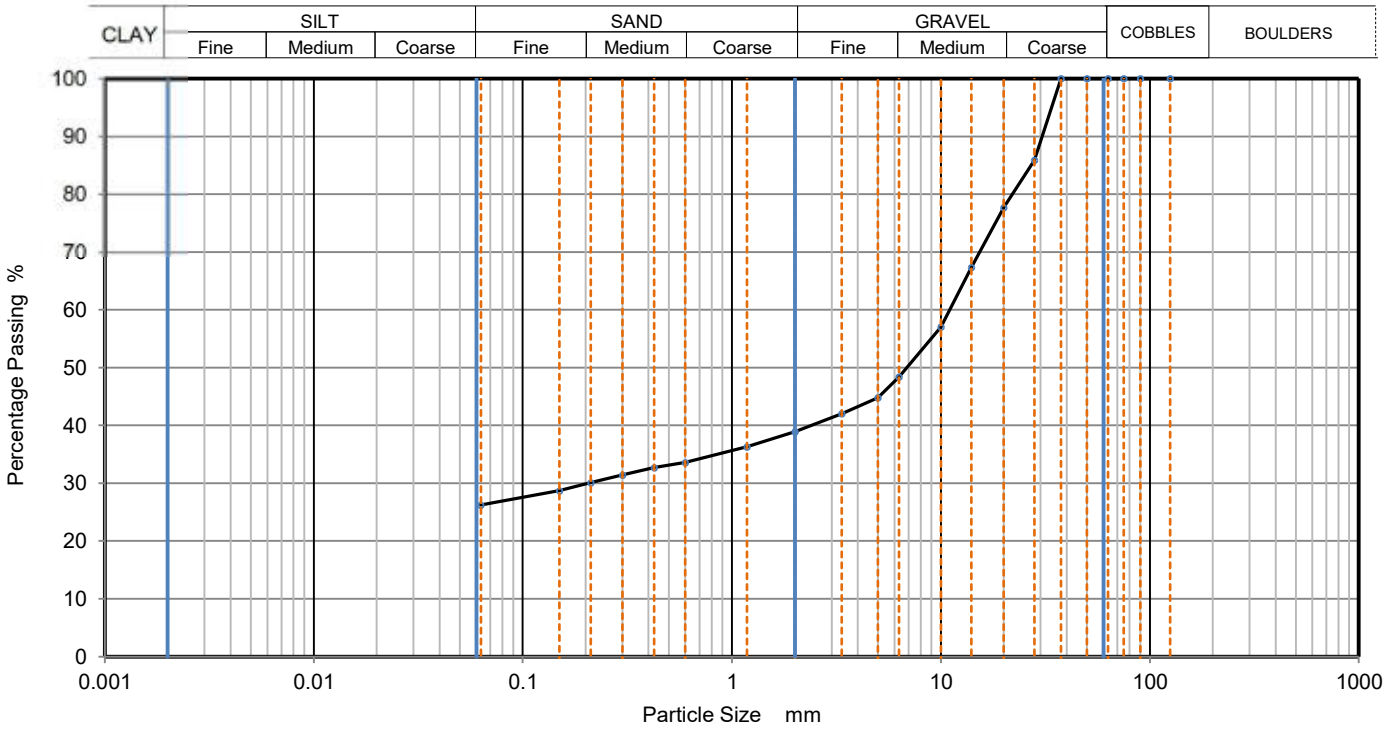
Date: 13/09/2018

UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH6
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Reddish brown and pale greyish brown calcareous very clayey sandy GRAVEL (gravel consist of fmc sub-angular flint and fm sub-angular to sub-rounded chalk gravel)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/09/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	86		
20	78		
14	67		
10	57		
6.3	48		
5	45		
3.35	42		
2	39		
1.18	36		
0.6	34		
0.425	33		
0.3	31		
0.212	30		
0.15	29		
0.063	26		

Dry Mass of sample, g	752

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	61.1
Sand	12.7
Fines <0.063mm	26.2

Grading Analysis		
D100	mm	
D60	mm	11
D30	mm	0.206
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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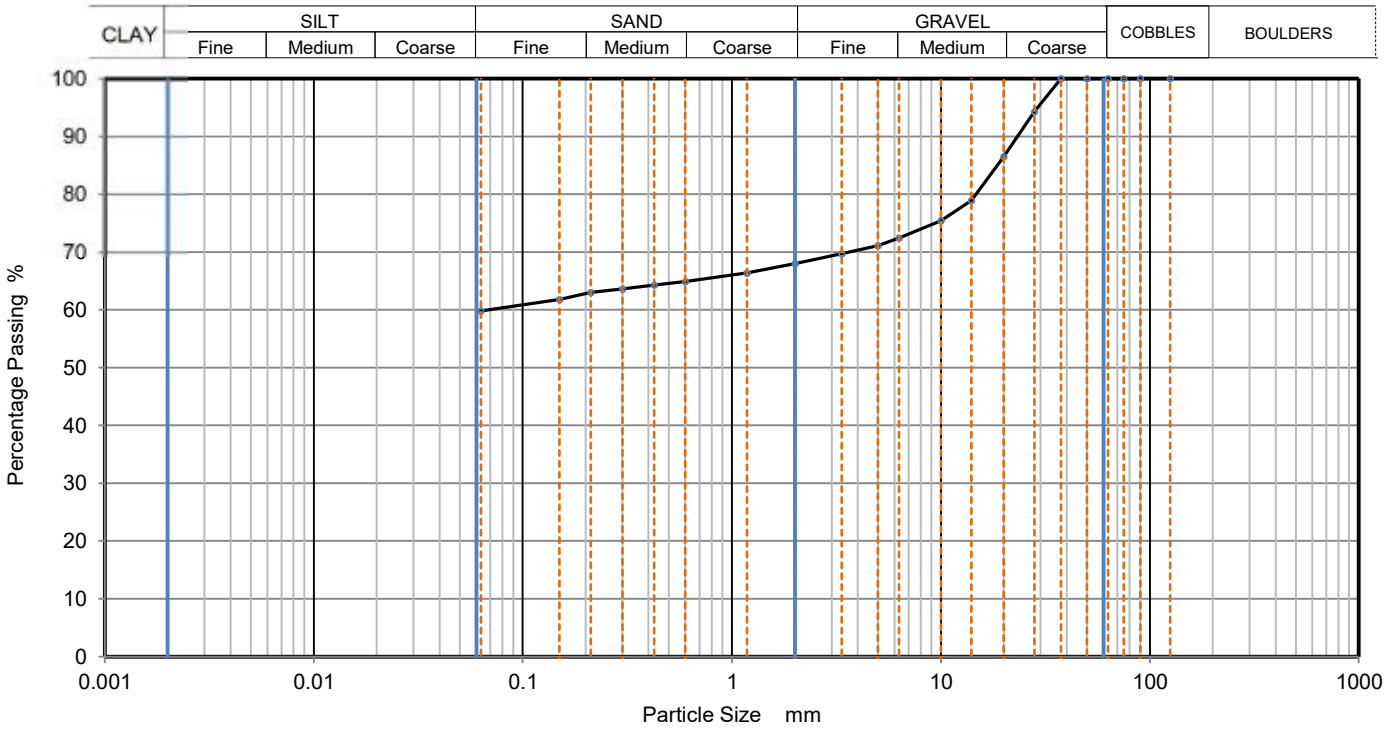
Date: 13/09/2018

UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH6
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	4.00 m
Soil Description	Greyish brown slightly calcareous slightly gravelly slightly sandy silty CLAY with occasional chalk fragments (gravel consist of fmc sub-angular flint and fm sub-rounded chalk gravel)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	03/09/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	94		
20	87		
14	79		
10	75		
6.3	72		
5	71		
3.35	70		
2	68		
1.18	66		
0.6	65		
0.425	64		
0.3	64		
0.212	63		
0.15	62		
0.063	60		

Dry Mass of sample, g	279

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	32.0
Sand	8.2
Fines <0.063mm	59.8

Grading Analysis		
D100	mm	
D60	mm	0.0696
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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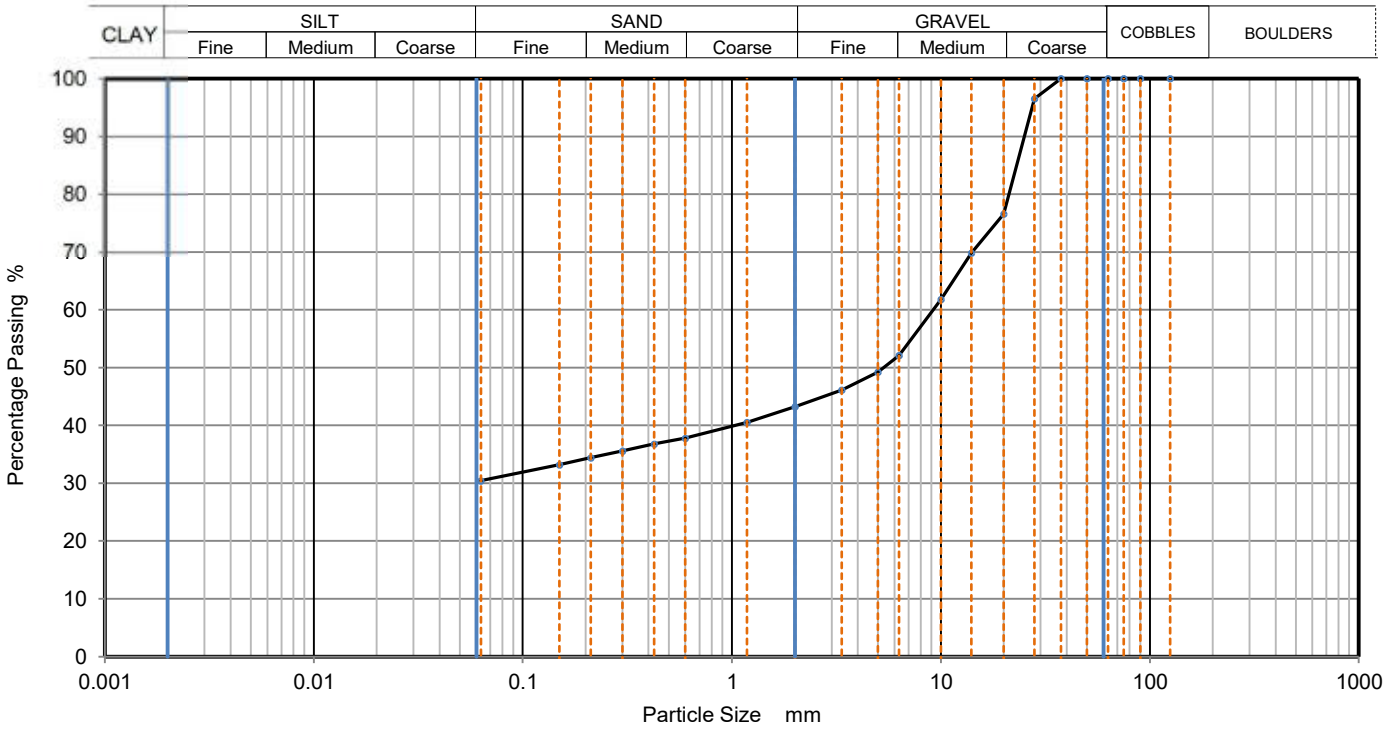
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH7
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pale grey and reddish brown gravelly slightly sandy silty calcareous CLAY (gravel consist of fmc sub-angular flint and fm sub-angular chalk gravel)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/09/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	77		
14	70		
10	62		
6.3	52		
5	49		
3.35	46		
2	43		
1.18	41		
0.6	38		
0.425	37		
0.3	36		
0.212	34		
0.15	33		
0.063	30		

Dry Mass of sample, g	809

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	56.8
Sand	12.8
Fines <0.063mm	30.4

Grading Analysis		
D100	mm	
D60	mm	9.18
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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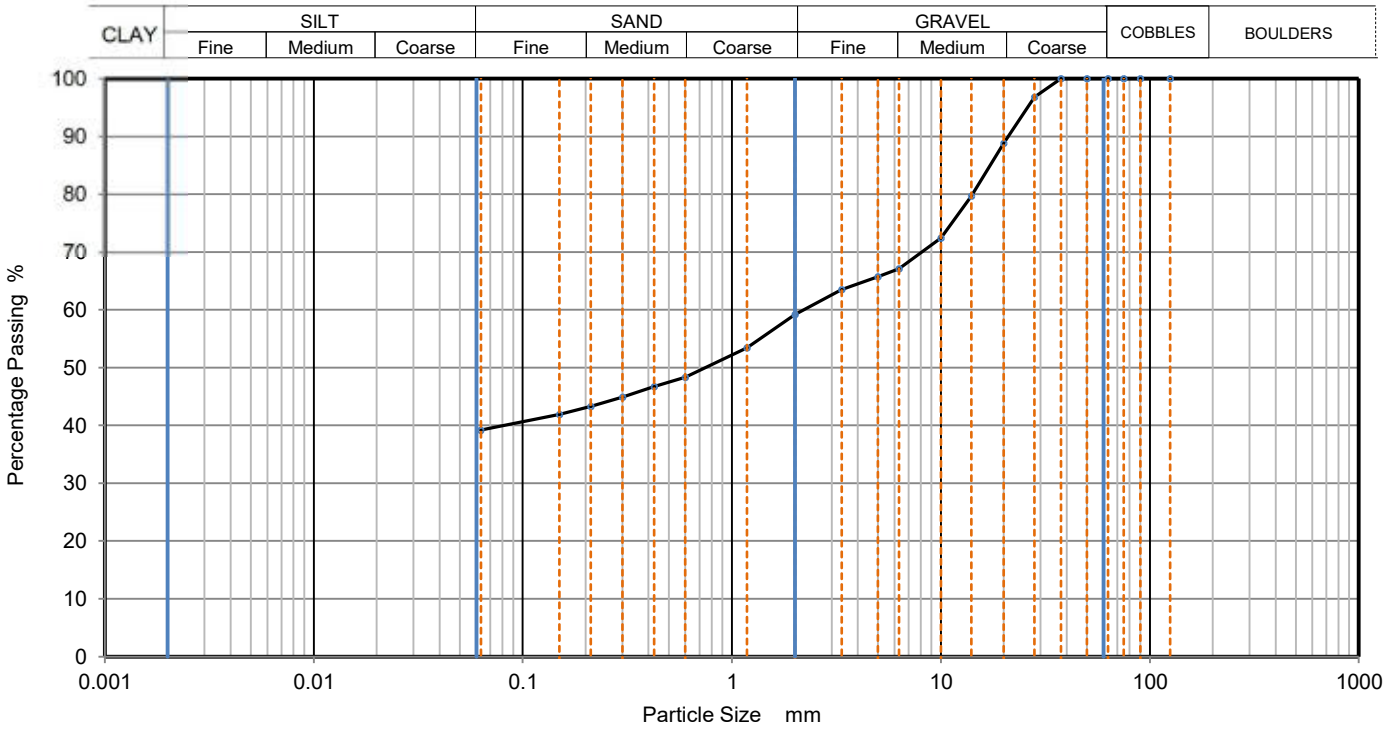
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH8
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pale greyish brown gravelly slightly sandy silty calcareous CLAY with occasional chalk deposits (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	01/08/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	89		
14	80		
10	72		
6.3	67		
5	66		
3.35	64		
2	59		
1.18	53		
0.6	48		
0.425	47		
0.3	45		
0.212	43		
0.15	42		
0.063	39		

Dry Mass of sample, g	897

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	40.8
Sand	20.1
Fines <0.063mm	39.2

Grading Analysis		
D100	mm	
D60	mm	2.19
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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UKAS TESTING 2519

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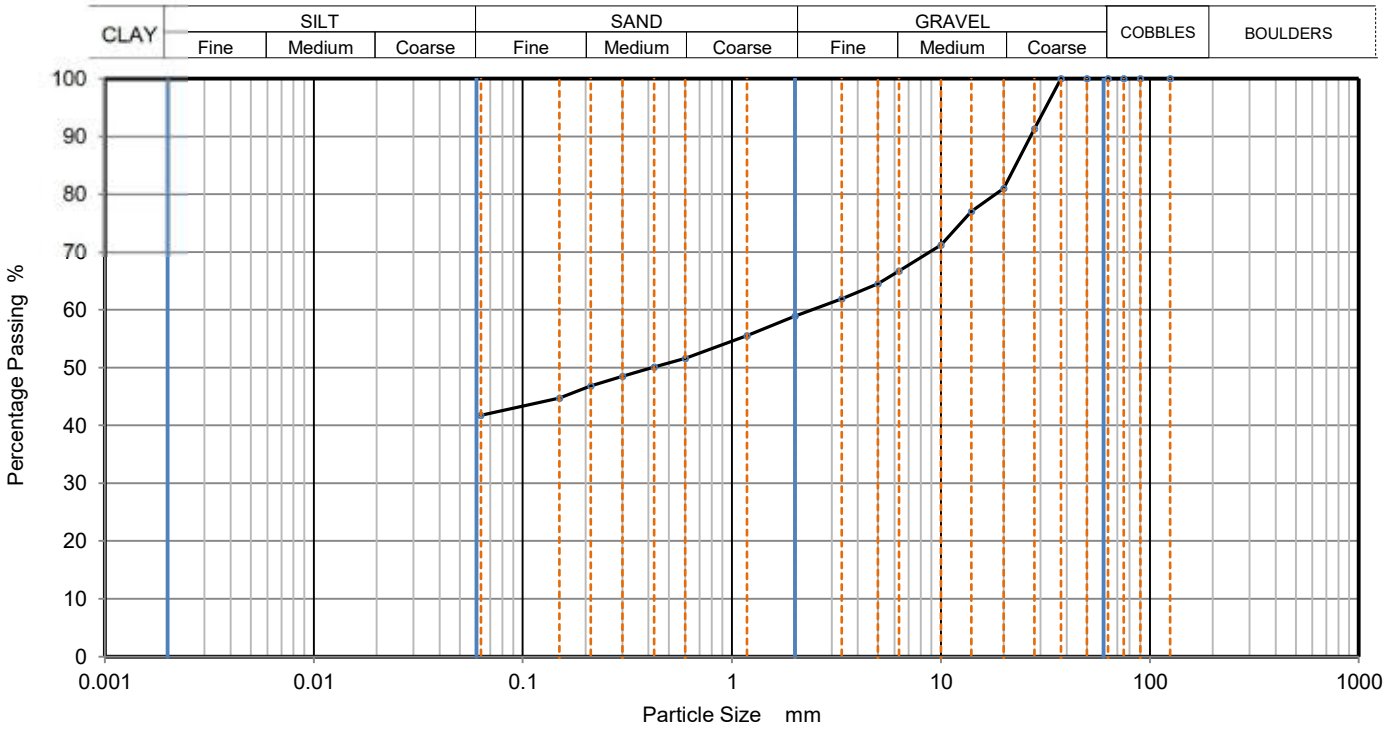
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH11
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pale greyish brown gravelly slightly sandy silty calcareous CLAY with occasional chalk deposits (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	01/08/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	91		
20	81		
14	77		
10	71		
6.3	67		
5	65		
3.35	62		
2	59		
1.18	56		
0.6	52		
0.425	50		
0.3	49		
0.212	47		
0.15	45		
0.063	42		

Dry Mass of sample, g	580

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	41.1
Sand	17.3
Fines <0.063mm	41.7

Grading Analysis		
D100	mm	
D60	mm	2.42
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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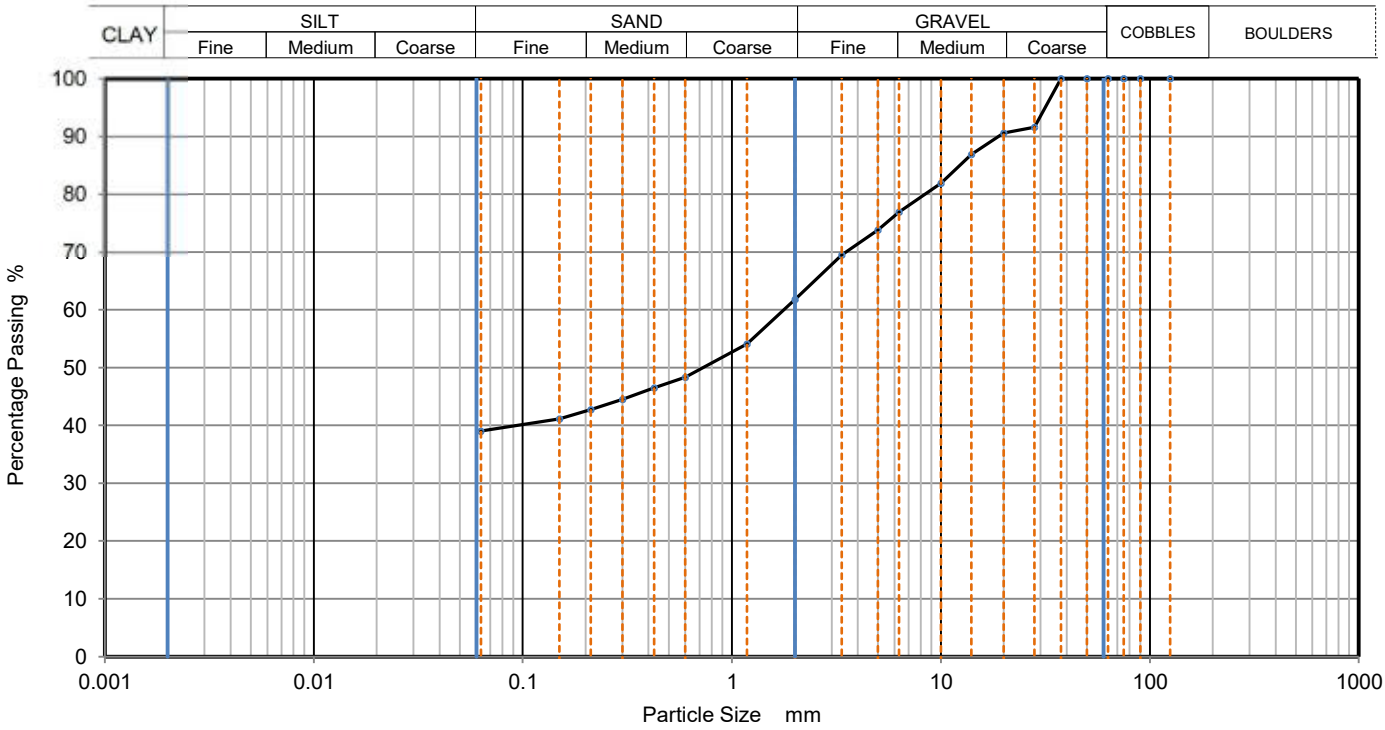
Date: 13/09/2018

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BH12
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pale greyish brown gravelly slightly sandy silty calcareous CLAY with occasional chalk deposits (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/08/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	92		
20	91		
14	87		
10	82		
6.3	77		
5	74		
3.35	70		
2	62		
1.18	54		
0.6	48		
0.425	47		
0.3	45		
0.212	43		
0.15	41		
0.063	39		

Dry Mass of sample, g	931

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	38.2
Sand	22.7
Fines <0.063mm	39.0

Grading Analysis		
D100	mm	
D60	mm	1.77
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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UKAS TESTING 2519

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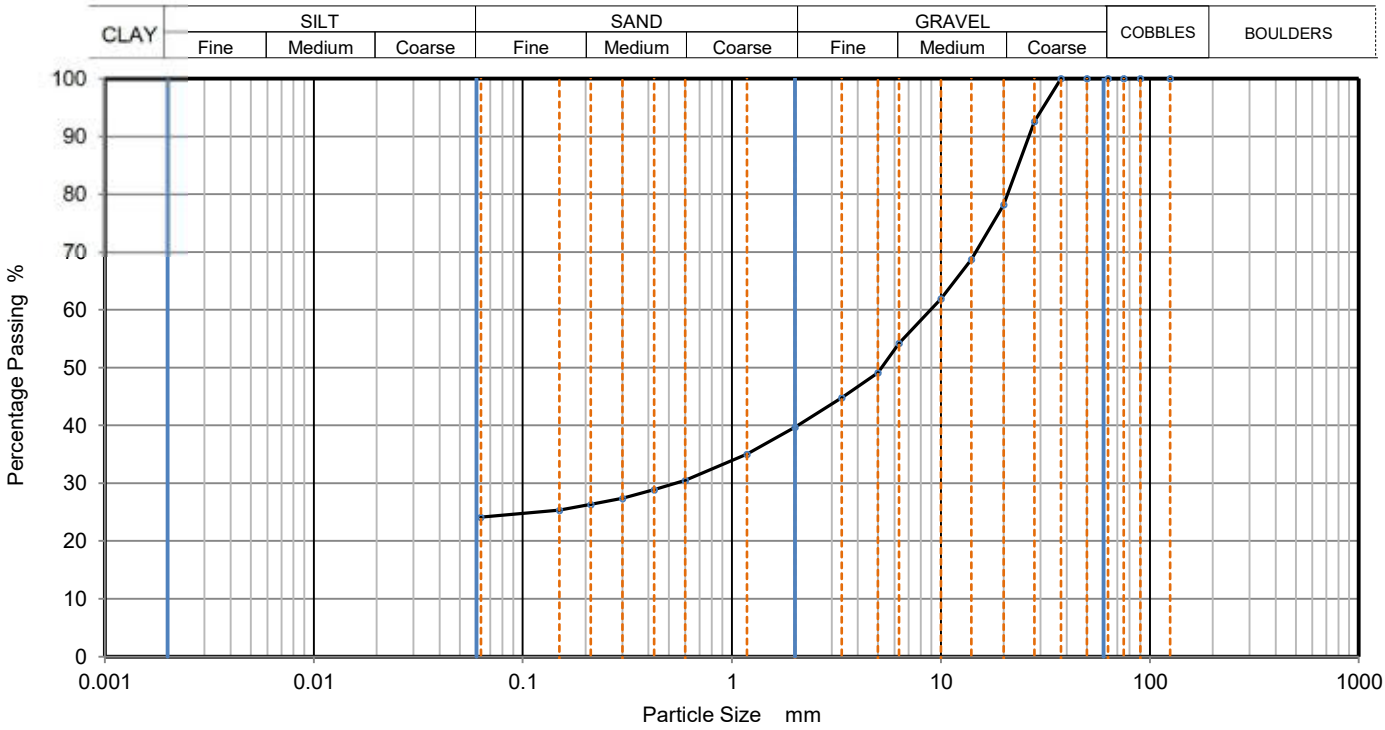
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Sample No.	-
Project No.	K4-	Client	Wilson Bailey	Depth Top	1.50 m
Soil Description	Pale grey calcareous very clayey sandy GRAVEL (gravel is fm and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	02/08/2018

Job Ref: 24894
Borehole/Pit No.: BH17



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	78		
14	69		
10	62		
6.3	54		
5	49		
3.35	45		
2	40		
1.18	35		
0.6	31		
0.425	29		
0.3	27		
0.212	26		
0.15	25		
0.063	24		

Dry Mass of sample, g: 1857

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	60.3
Sand	15.7
Fines <0.063mm	24.1

Grading Analysis		
D100	mm	
D60	mm	8.9
D30	mm	0.534
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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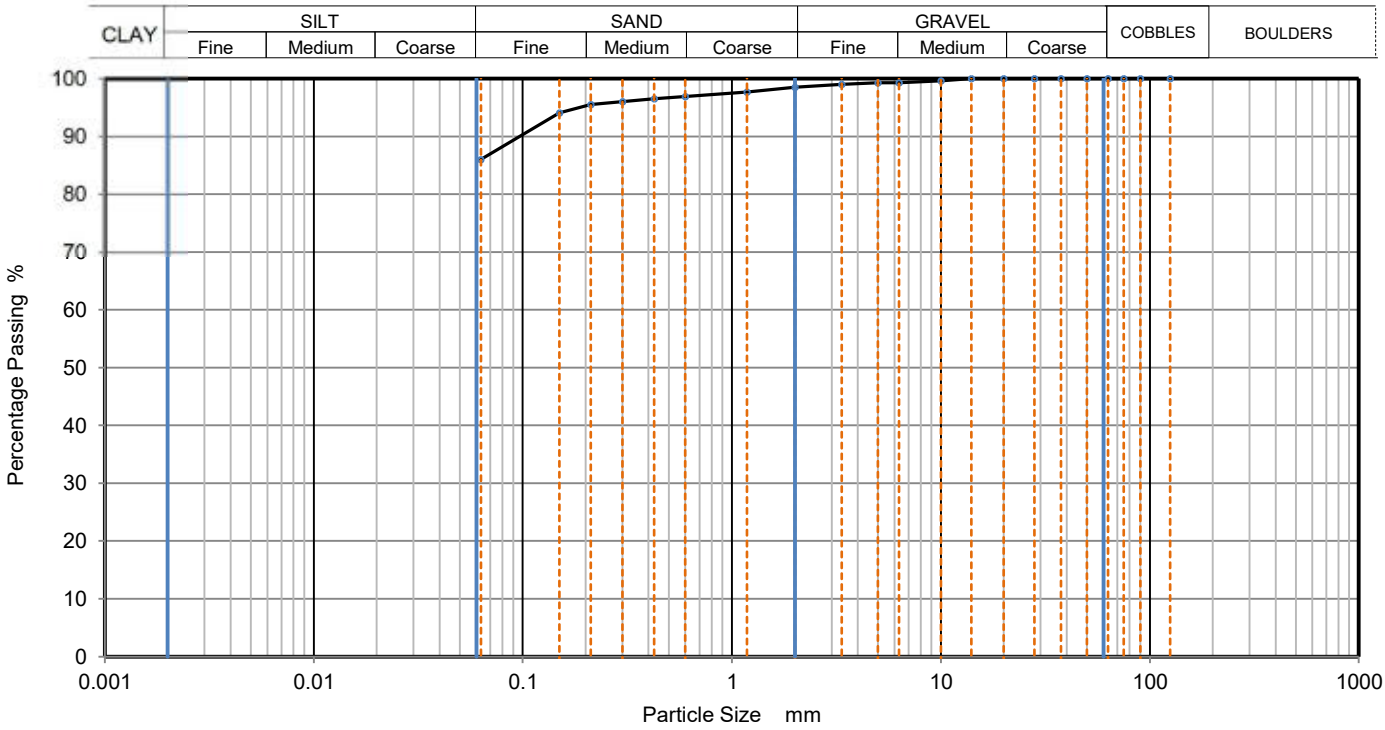
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BHR1
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	1.50 m
Soil Description	Brown slightly sandy silty CLAY with rare fm sub-rounded gravel			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	03/08/2018



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	100		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	98		
0.6	97		
0.425	97		
0.3	96		
0.212	96		
0.15	94		
0.063	86		

Dry Mass of sample, g	79

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	1.5
Sand	12.5
Fines <0.063mm	86.0

Grading Analysis		
D100	mm	
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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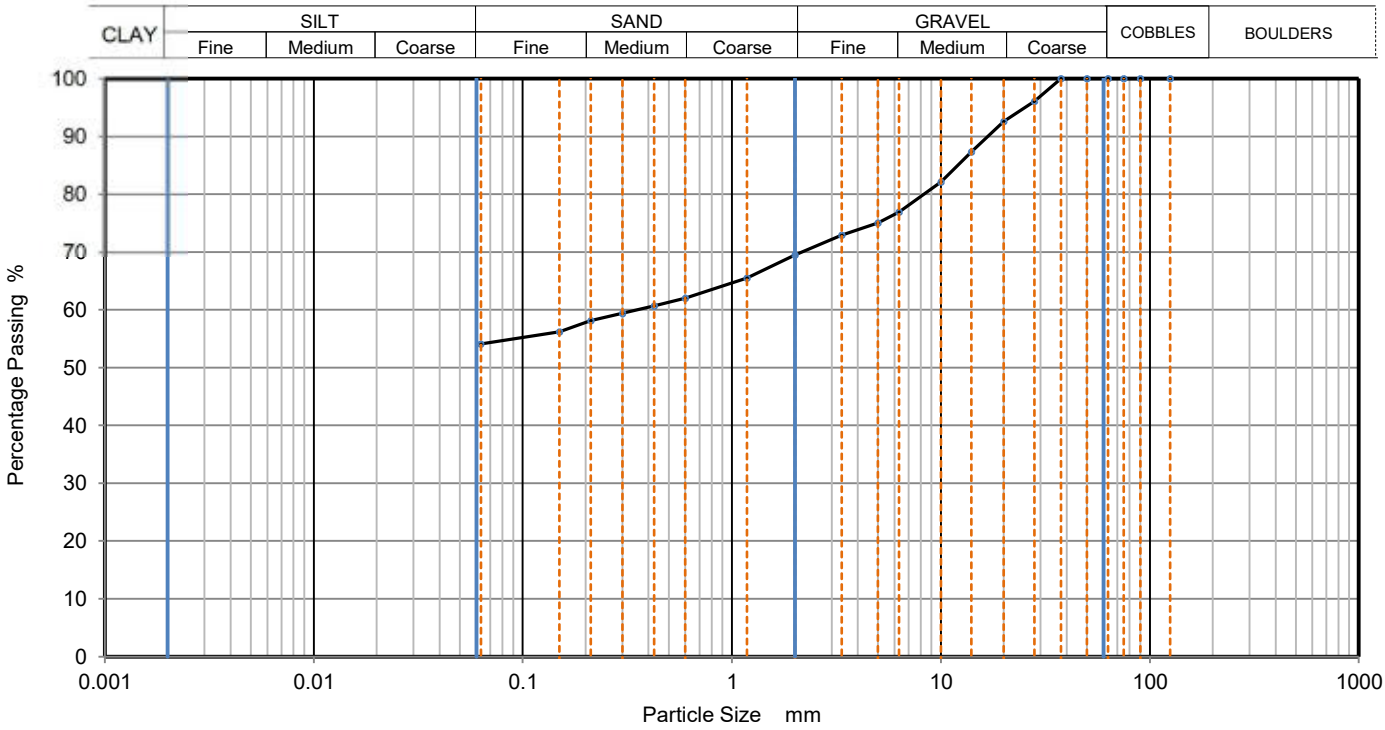
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BHR1
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.50 m
Soil Description	Pale greyish brown slightly gravelly calcareous slightly sandy CLAY with occasional chalk deposits (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	03/08/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	93		
14	87		
10	82		
6.3	77		
5	75		
3.35	73		
2	70		
1.18	66		
0.6	62		
0.425	61		
0.3	59		
0.212	58		
0.15	56		
0.063	54		

Dry Mass of sample, g	565

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	30.5
Sand	15.4
Fines <0.063mm	54.1

Grading Analysis		
D100	mm	
D60	mm	0.351
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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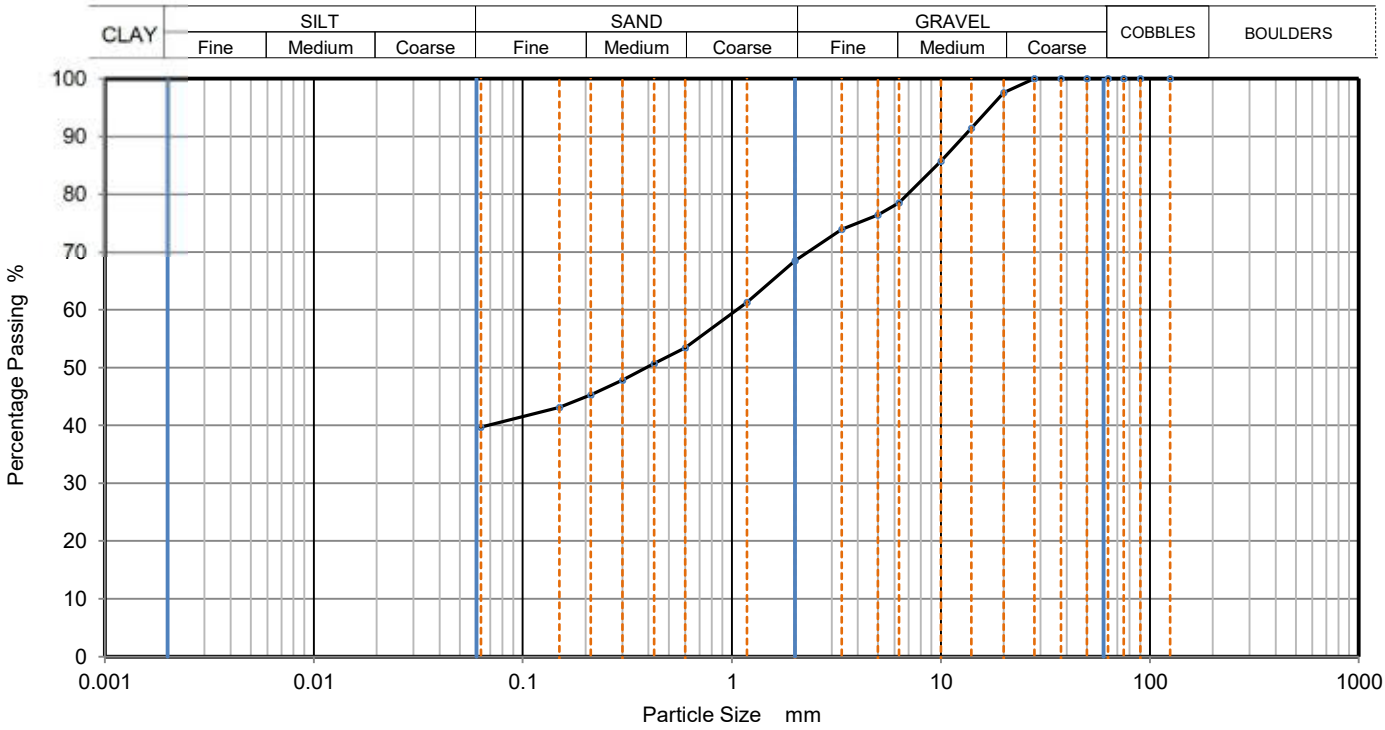
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BHR2
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Greyish pink and pale reddish brown slightly gravelly calcareous slightly sandy CLAY with frequent calcareous deposits (gravel consist of fm sub-angular to sub-rounded flint and fm sub-angular chalk gravel)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	01/08/2018



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	98		
14	91		
10	86		
6.3	79		
5	76		
3.35	74		
2	69		
1.18	61		
0.6	53		
0.425	51		
0.3	48		
0.212	45		
0.15	43		
0.063	40		

Dry Mass of sample, g	828

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	31.5
Sand	28.8
Fines <0.063mm	39.7

Grading Analysis		
D100	mm	
D60	mm	1.06
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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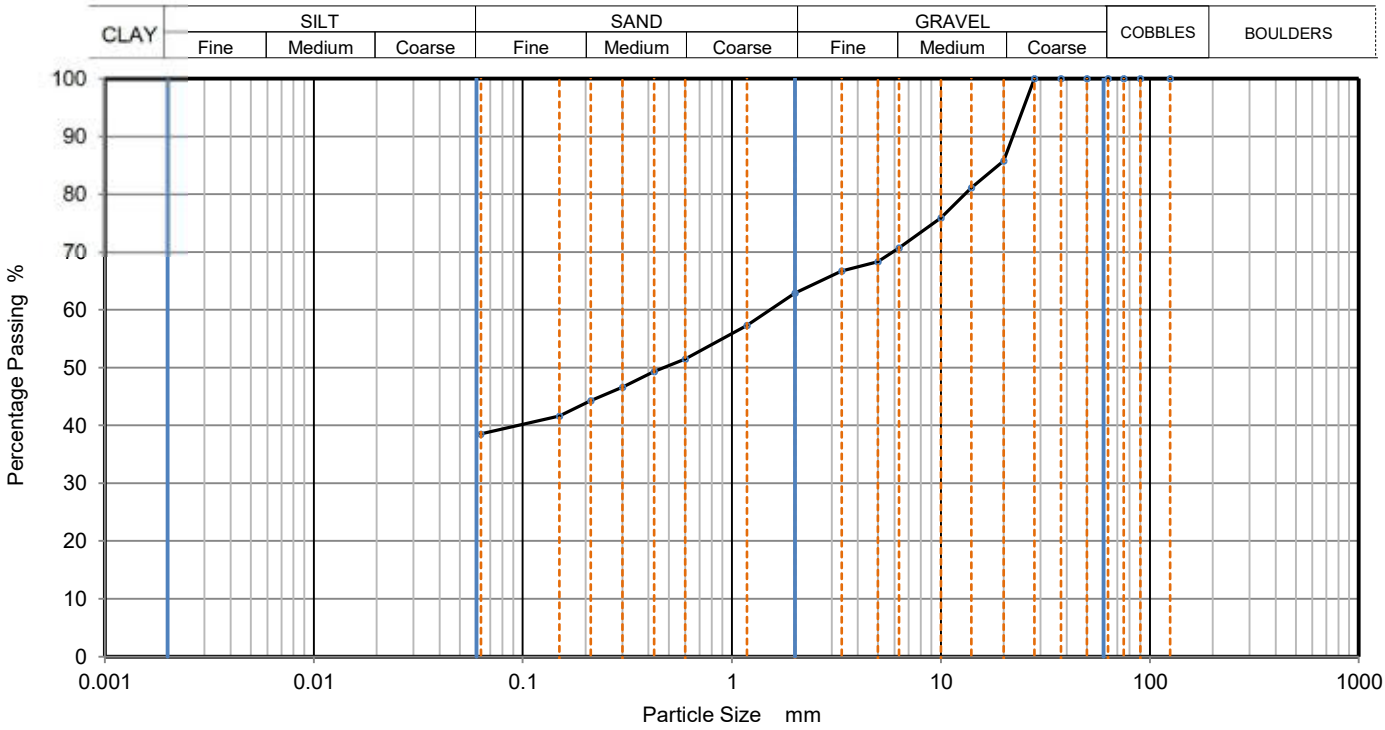
PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BHR6
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pinkish grey gravelly slightly sandy calcareous CLAY (gravel is fmc and sub-angular to sub-rounded)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	03/08/2018



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	86		
14	81		
10	76		
6.3	71		
5	68		
3.35	67		
2	63		
1.18	57		
0.6	52		
0.425	49		
0.3	47		
0.212	44		
0.15	42		
0.063	39		

Dry Mass of sample, g	498

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	37.1
Sand	24.4
Fines <0.063mm	38.5

Grading Analysis		
D100	mm	
D60	mm	1.52
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

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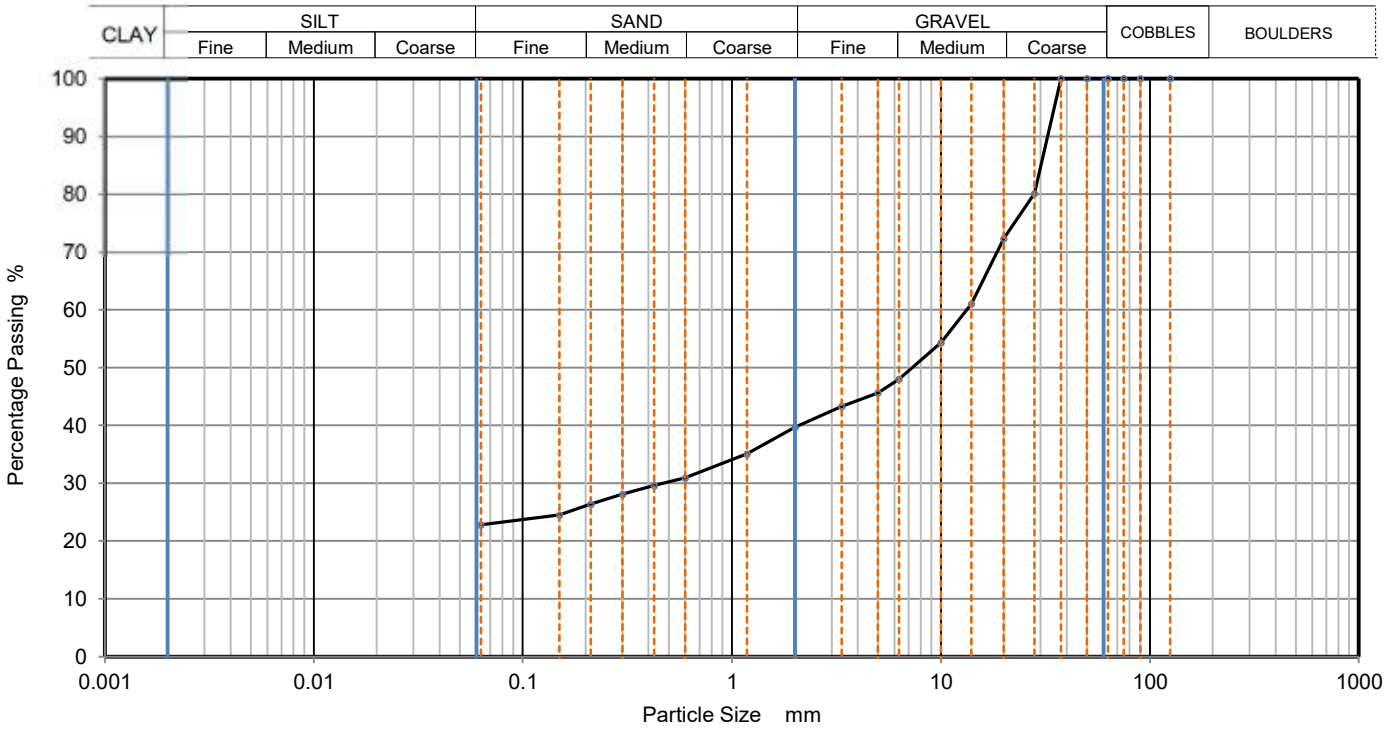
Date: 13/09/2018

UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Job Ref	24894
				Borehole/Pit No.	BHR8
Project No.	K4-	Client	Wilson Bailey	Sample No.	-
				Depth Top	2.00 m
Soil Description	Pale greyish brown very clayey sandy GRAVEL with occasional chalk deposits (gravel is fmc and sub-angular)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	01/08/2018



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	80		
20	72		
14	61		
10	54		
6.3	48		
5	46		
3.35	43		
2	40		
1.18	35		
0.6	31		
0.425	30		
0.3	28		
0.212	26		
0.15	25		
0.063	23		

Dry Mass of sample, g	1200

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	60.3
Sand	16.9
Fines <0.063mm	22.8

Grading Analysis		
D100	mm	
D60	mm	13.3
D30	mm	0.475
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

K4 Soils Laboratory

Unit 8, Olds Close, Watford, Herts, WD18 9RU

Email: james@k4soils.com

Tel: 01923 711288

Checked and Approved

Initials: **K.P**

Date: 13/09/2018

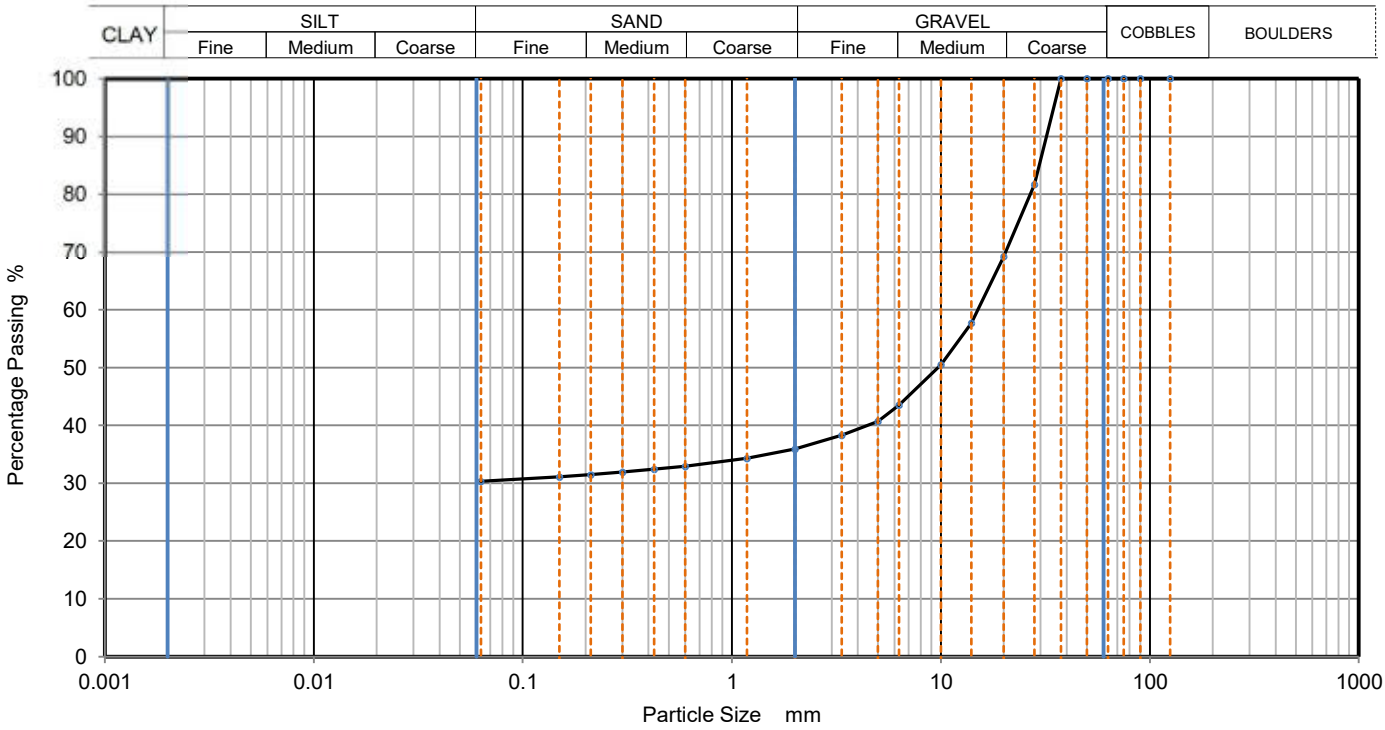
UKAS TESTING 2519

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

PARTICLE SIZE DISTRIBUTION

Site Name	Eastergate			Sample No.	-
Project No.	K4-	Client	Wilson Bailey	Depth Top	2.00 m
Soil Description	Reddish brown gravelly slightly sandy silty CLAY (gravel is fmc and sub-angular to sub-rounded)			Depth Base	- m
				Sample Type	D
				Samples received	06/07/2018
				Schedules received	20/07/2018
Test Method	BS1377:Part 2: 1990, clause 9.0			Project started	20/07/2018
				Date tested	01/08/2018

Job Ref	24894
Borehole/Pit No.	BHR9



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	82		
20	69		
14	58		
10	51		
6.3	44		
5	41		
3.35	38		
2	36		
1.18	34		
0.6	33		
0.425	32		
0.3	32		
0.212	32		
0.15	31		
0.063	30		

Dry Mass of sample, g	735

Sample Proportions	% dry mass
Very coarse	0.0
Gravel	64.1
Sand	5.6
Fines <0.063mm	30.3

Grading Analysis		
D100	mm	
D60	mm	15
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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Date: 13/09/2018

UKAS TESTING 2519

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

Sulphate Content (Gravimetric Method) for 2:1 Soil: Water Extract and pH Value - Summary of Results

Tested in accordance with BS1377 : Part 3 : 1990, clause 5.3 and clause 9

Job No.	Project Name	Programme	
24894	Eastergate	Samples received	06/07/2018
		Schedule received	20/07/2018
Project No.	Client	Project started	20/07/2018
K4-	Wilson Bailey	Testing Started	03/09/2018

Hole No.	Sample				Soil description	Dry Mass passing 2mm	SO3 Content	SO4 Content	pH	Remarks
	Ref	Top m	Base m	Type		%	g/l	g/l		
BH1	-	1.00	-	D	Brown silty very gravelly CLAY with traces of rootlets (gravel is fmc and angular to sub-angular)	48	0.11	0.13	7.62	
BH3	-	1.00	-	D	Brown slightly sandy silty CLAY with dark grey carbonaceous deposits and rare fine sub-angular fine gravel	99	0.01	0.01	7.75	
BH6	-	2.00	-	D	Reddish brown and pale greyish brown calcareous very clayey sandy GRAVEL (gravel consist of fmc sub-angular flint and fm sub-angular to sub-rounded chalk gravel)	39	0.10	0.12	7.80	
BH7	-	1.00	-	D	Reddish brown gravelly slightly sandy silty CLAY with scattered calcaeous deposits (gravel is fmc and angular to sub-angular)	42	0.09	0.10	7.81	
BH11	-	1.00	-	D	Reddsh brown slightly gravelly slightly sandy silty CLAY (gravel is fm and sub-angular)	98	0.14	0.16	7.66	
BH17	-	1.00	-	D	Reddish brown gravelly slightly sandy silty CLAY with traces of calcareous deposits (gravel is fmc and angular to sub-angular)	48	0.16	0.19	7.69	
BHR1	-	1.00	-	D	Reddish brown slightly andy silty CLAY with dark grey carbonaceous stains and occasional rootlets	100	0.11	0.14	7.80	
BHR2	-	1.00	-	D	Reddish brown slightly sandy silty CLAY with rare fine sub-angular gravel	99	0.20	0.24	7.71	
BHR4	-	1.00	-	D	Brown gravelly sandy silty CLAY with occasional roots and rootlets (gravel is fmc and angular to sub-angular)	41	0.08	0.09	7.70	
BHR8	-	1.00	-	D	Brown sandy gravelly CLAY with occasional roots and rootlets (gravel is fmc and sub-angular to sub-rounded)	50	0.11	0.13	7.60	
BHR9	-	1.00	-	D	Reddish brown slightly sandy silty CLAY with rare fine gravel	100	0.14	0.17	7.56	

Test Report by K4 SOILS LABORATORY
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Checked and Approved
Initials K.P
Date: 13/09/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R1
Site Name	Eastergate			Depth m	0.30
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	1

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

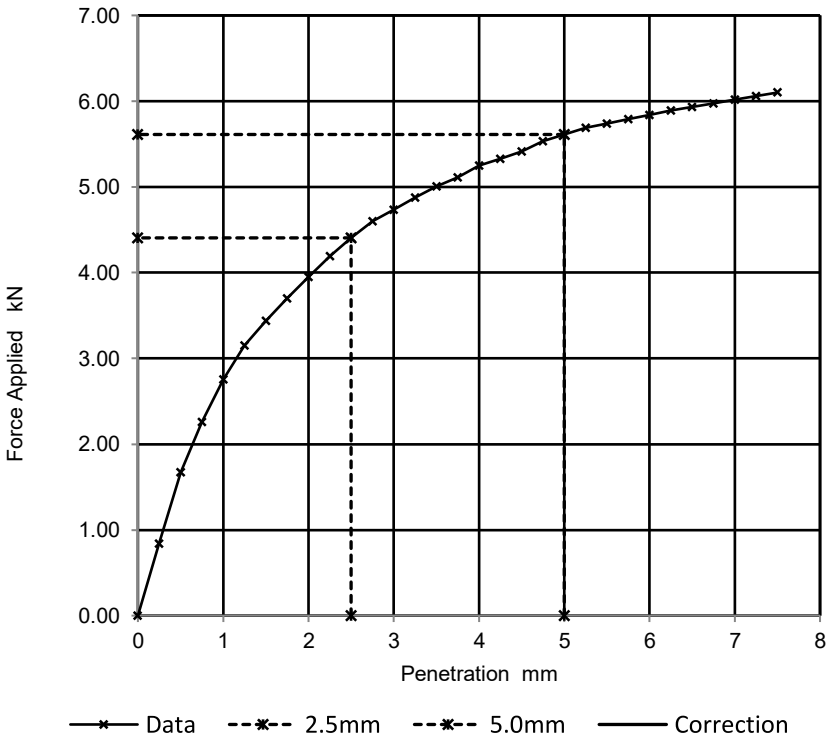
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	28	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	118	0.84
0.50	235	1.68
0.75	317	2.26
1.00	386	2.75
1.25	442	3.15
1.50	482	3.44
1.75	519	3.70
2.00	554	3.95
2.25	588	4.19
2.50	618	4.41
2.75	645	4.60
3.00	664	4.73
3.25	684	4.88
3.50	702	5.01
3.75	717	5.11
4.00	736	5.25
4.25	747	5.33
4.50	759	5.41
4.75	776	5.53
5.00	787	5.61
5.25	798	5.69
5.50	805	5.74
5.75	812	5.79
6.00	819	5.84
6.25	826	5.89
6.50	832	5.93
6.75	838	5.97
7.00	844	6.02
7.25	850	6.06
7.50	856	6.10

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	33	28	**33**	11

Test Report by K4 SOILS LABORATORY
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Initials: **J.P**

Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R2
Site Name	Eastergate			Depth m	0.20
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	2

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

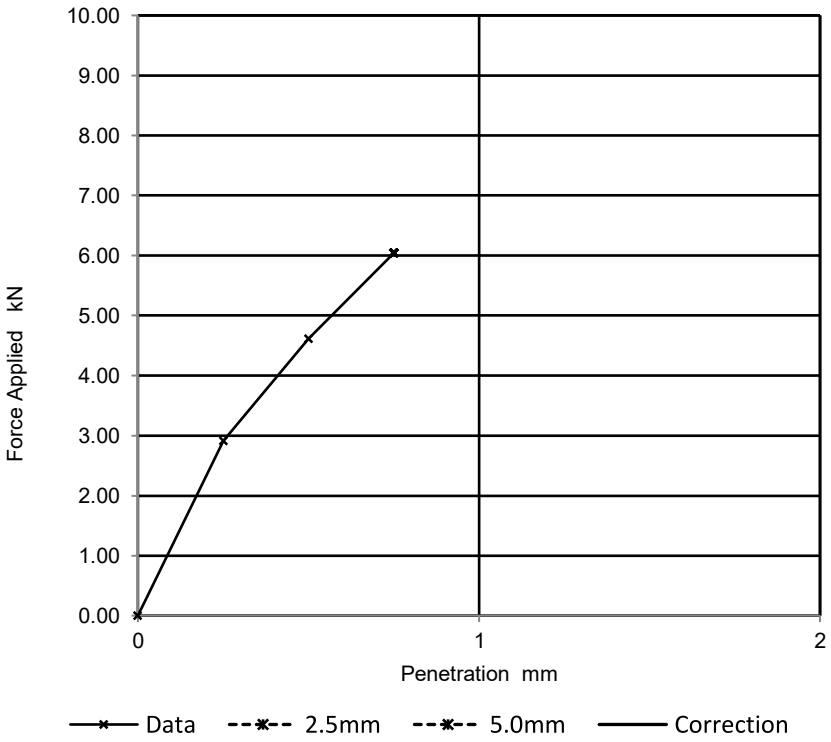
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	28	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	409	2.92
0.50	647	4.61
0.75	847	6.04
1.00		
1.25		
1.50		
1.75		
2.00		
2.25		
2.50		
2.75		
3.00		
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	-	-	**>30**	10

Test Report by K4 SOILS LABORATORY
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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R3
Site Name	Eastergate			Depth m	0.30
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	3

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

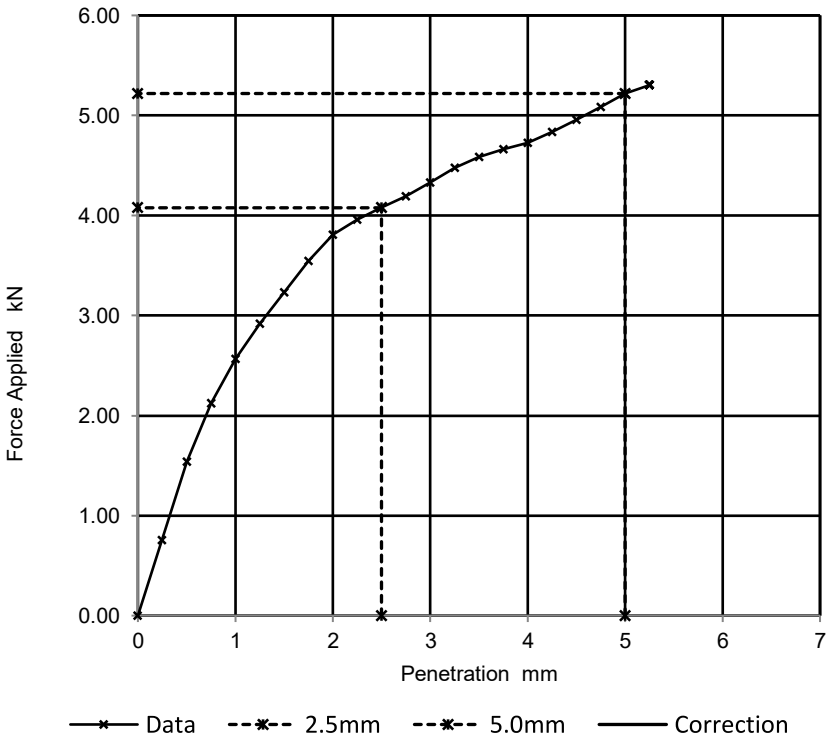
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	28	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	106	0.76
0.50	216	1.54
0.75	298	2.12
1.00	360	2.57
1.25	409	2.92
1.50	453	3.23
1.75	497	3.54
2.00	534	3.81
2.25	555	3.96
2.50	572	4.08
2.75	588	4.19
3.00	607	4.33
3.25	628	4.48
3.50	643	4.58
3.75	654	4.66
4.00	663	4.73
4.25	678	4.83
4.50	695	4.96
4.75	713	5.08
5.00	732	5.22
5.25	744	5.30
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	31	26	**31**	9.8

Test Report by K4 SOILS LABORATORY
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Initials: **J.P**

Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R4
Site Name	Eastergate			Depth m	0.30
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	4

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

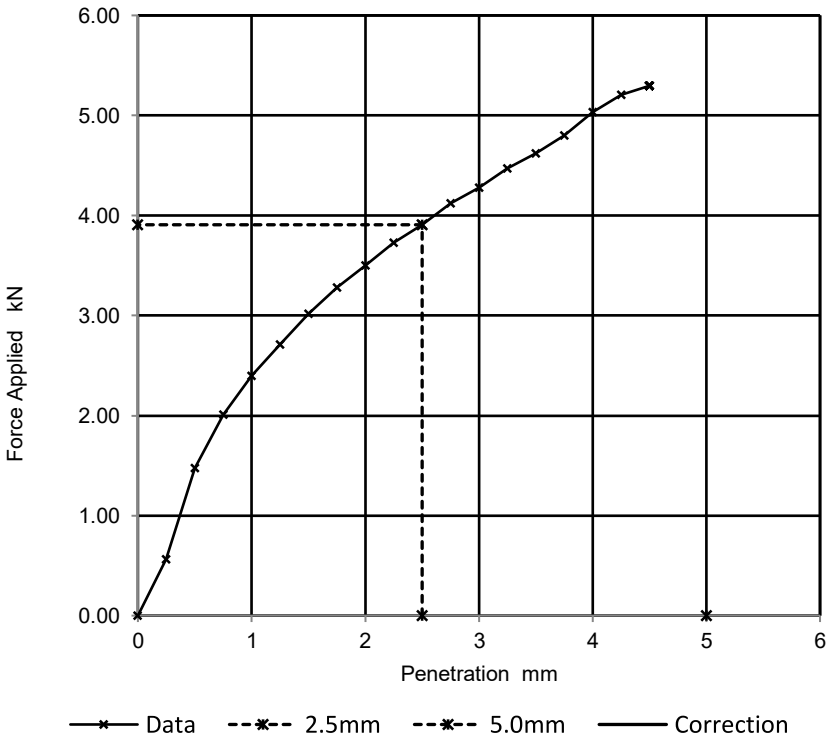
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	28	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	79	0.56
0.50	207	1.48
0.75	282	2.01
1.00	336	2.40
1.25	380	2.71
1.50	423	3.02
1.75	460	3.28
2.00	491	3.50
2.25	523	3.73
2.50	548	3.91
2.75	578	4.12
3.00	600	4.28
3.25	627	4.47
3.50	648	4.62
3.75	673	4.80
4.00	706	5.03
4.25	730	5.20
4.50	743	5.30
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	30	-	**30**	10

Test Report by K4 SOILS LABORATORY
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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R5
Site Name	Eastergate			Depth m	0.20
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	5

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

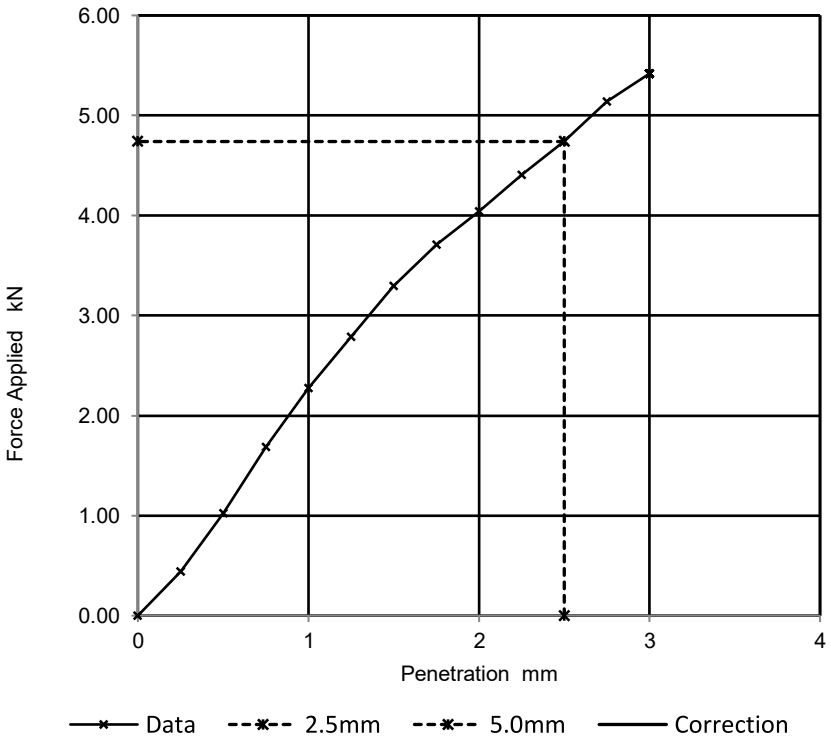
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	62	0.44
0.50	144	1.03
0.75	237	1.69
1.00	319	2.27
1.25	391	2.79
1.50	462	3.29
1.75	520	3.71
2.00	567	4.04
2.25	618	4.41
2.50	665	4.74
2.75	721	5.14
3.00	760	5.42
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	36	-	**36**	8.1

Test Report by K4 SOILS LABORATORY
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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R6
Site Name	Eastergate			Depth m	0.25
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	6

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

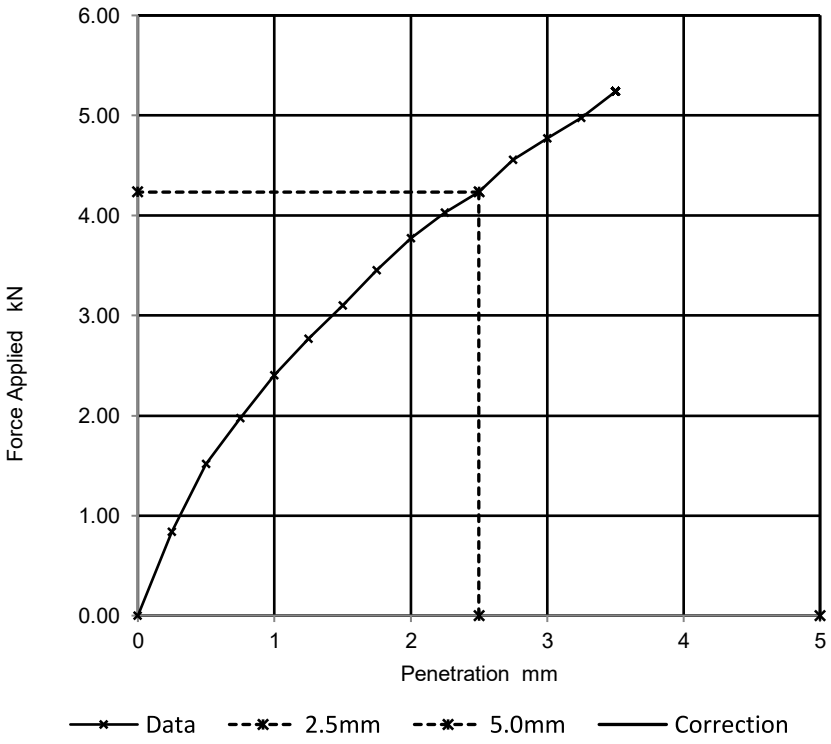
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	118	0.84
0.50	213	1.52
0.75	277	1.98
1.00	337	2.40
1.25	388	2.77
1.50	435	3.10
1.75	484	3.45
2.00	529	3.77
2.25	565	4.03
2.50	594	4.24
2.75	639	4.56
3.00	669	4.77
3.25	698	4.98
3.50	735	5.24
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	32	-	**32**	7.7

Test Report by K4 SOILS LABORATORY
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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R7
Site Name	Eastergate			Depth m	0.40
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	7

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

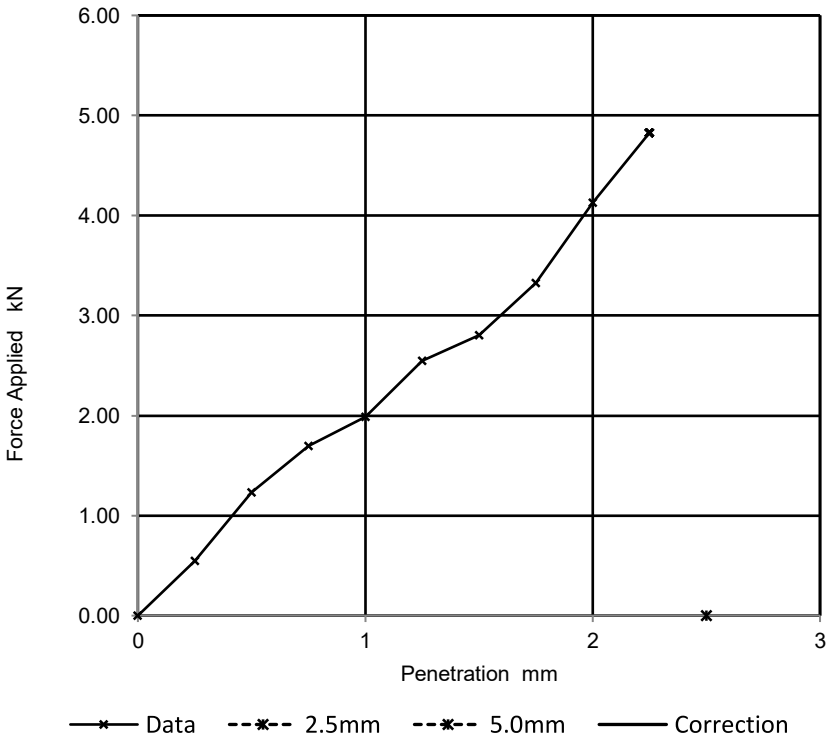
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	77	0.55
0.50	173	1.23
0.75	238	1.70
1.00	279	1.99
1.25	357	2.55
1.50	393	2.80
1.75	466	3.32
2.00	579	4.13
2.25	677	4.83
2.50		
2.75		
3.00		
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	-	-	**>30**	5.2

Test Report by K4 SOILS LABORATORY
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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR R8
Site Name	Eastergate			Depth m	0.30
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	8

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

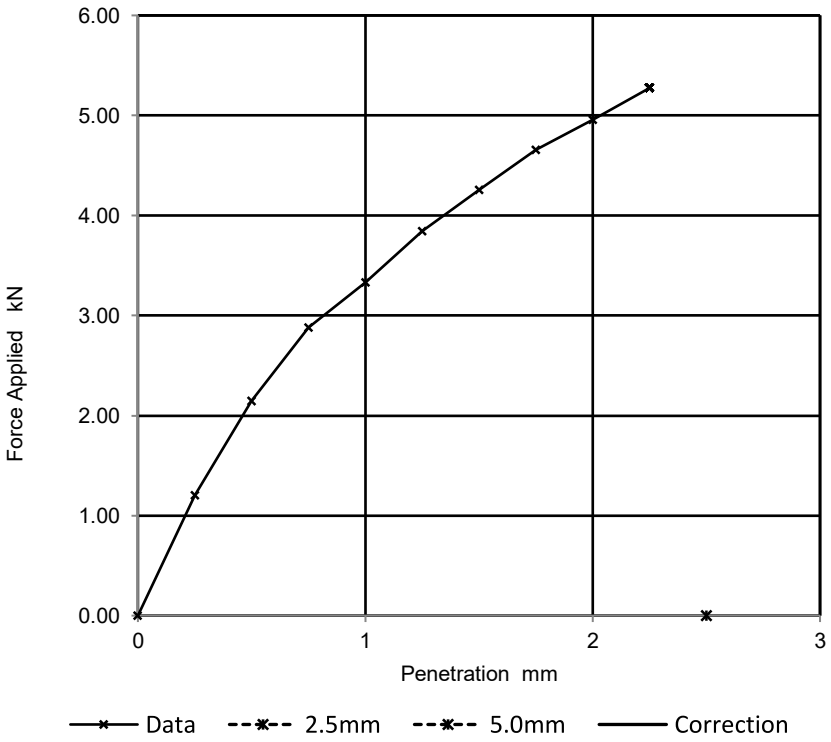
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	28	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	169	1.20
0.50	301	2.15
0.75	404	2.88
1.00	467	3.33
1.25	539	3.84
1.50	597	4.26
1.75	653	4.66
2.00	695	4.96
2.25	740	5.28
2.50		
2.75		
3.00		
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	-	-	**>30**	9.0

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

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials: **J.P**

Date: 10/07/2018

	In Situ California Bearing Ratio (CBR)			Job Ref	24814
				CBR No.	CBR R9
Site Name	Eastergate			Depth m	0.20
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	9

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

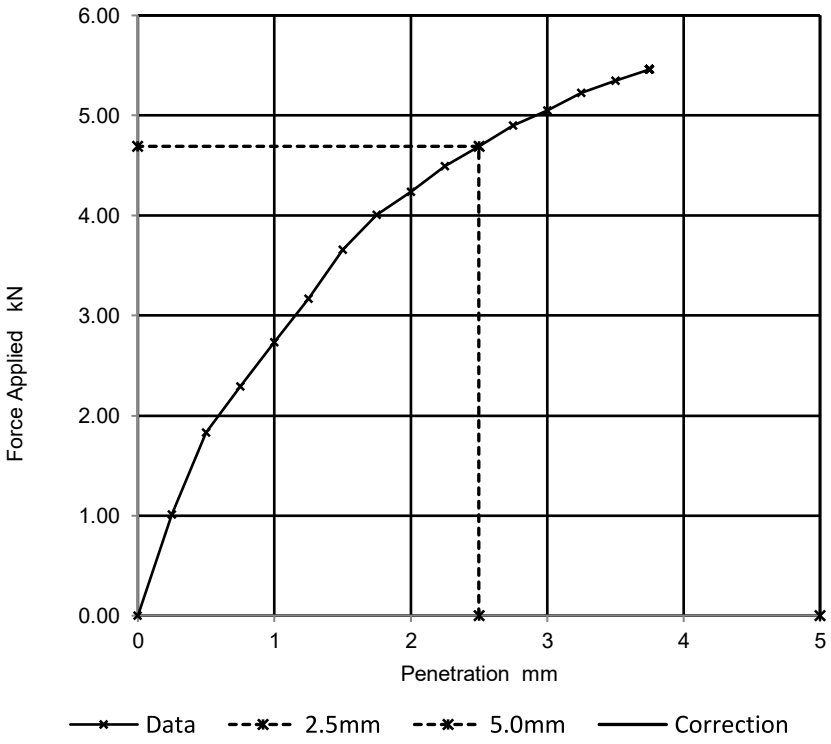
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	28	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	142	1.01
0.50	257	1.83
0.75	321	2.29
1.00	383	2.73
1.25	444	3.17
1.50	513	3.66
1.75	562	4.01
2.00	594	4.24
2.25	630	4.49
2.50	658	4.69
2.75	687	4.90
3.00	708	5.05
3.25	733	5.23
3.50	750	5.35
3.75	766	5.46
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	36	-	**36**	11

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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR S1
Site Name	Eastergate			Depth m	0.25
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	10

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

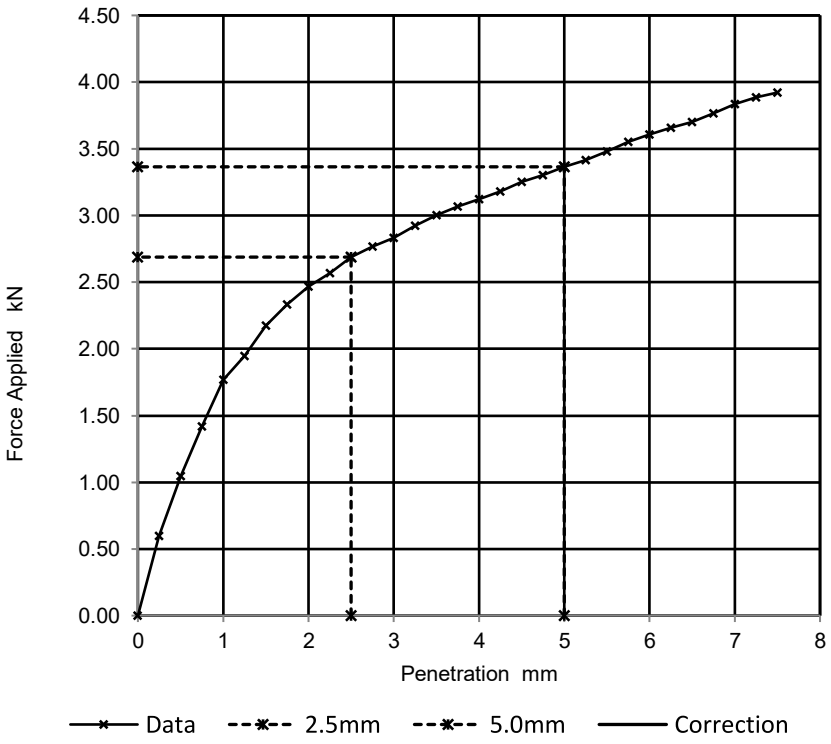
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	84	0.60
0.50	147	1.05
0.75	199	1.42
1.00	248	1.77
1.25	273	1.95
1.50	305	2.17
1.75	327	2.33
2.00	346	2.47
2.25	360	2.57
2.50	377	2.69
2.75	388	2.77
3.00	397	2.83
3.25	410	2.92
3.50	421	3.00
3.75	430	3.07
4.00	438	3.12
4.25	446	3.18
4.50	456	3.25
4.75	463	3.30
5.00	472	3.37
5.25	479	3.42
5.50	488	3.48
5.75	498	3.55
6.00	506	3.61
6.25	513	3.66
6.50	519	3.70
6.75	528	3.76
7.00	538	3.84
7.25	545	3.89
7.50	550	3.92

Force versus Penetration Plot



Remarks

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	20	17	**20**	11

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Initials: **J.P**

Date: 10/07/2018

	In Situ California Bearing Ratio (CBR)			Job Ref	24814
				CBR No.	CBR S2
Site Name	Eastergate			Depth m	0.20
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	11

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

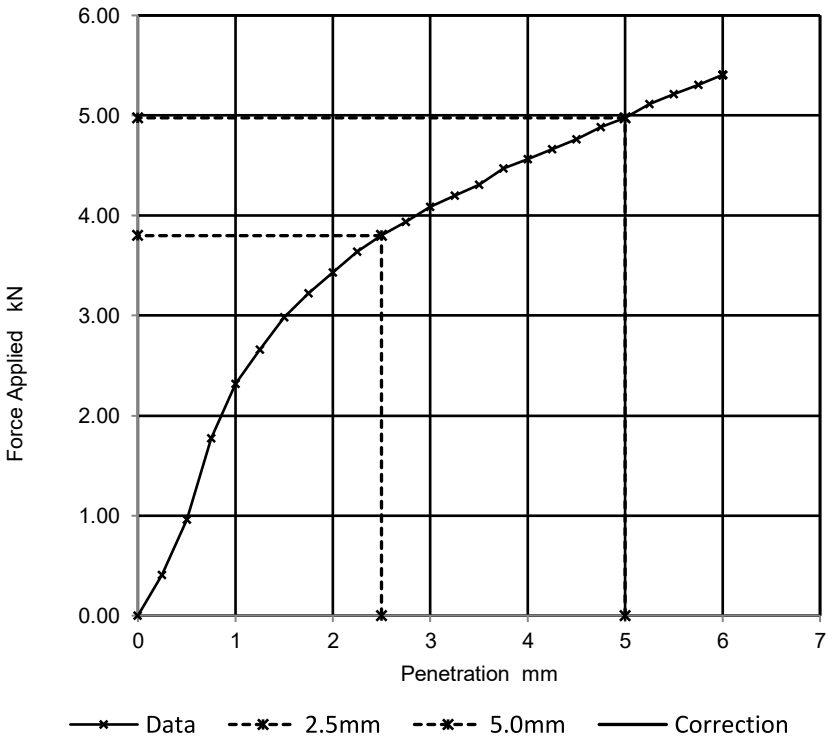
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	57	0.41
0.50	135	0.96
0.75	249	1.78
1.00	325	2.32
1.25	373	2.66
1.50	418	2.98
1.75	452	3.22
2.00	481	3.43
2.25	510	3.64
2.50	533	3.80
2.75	552	3.94
3.00	573	4.09
3.25	589	4.20
3.50	604	4.31
3.75	627	4.47
4.00	640	4.56
4.25	654	4.66
4.50	668	4.76
4.75	685	4.88
5.00	698	4.98
5.25	717	5.11
5.50	731	5.21
5.75	744	5.30
6.00	758	5.40
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	29	25	**29**	9.8

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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR S3
Site Name	Eastergate			Depth m	0.25
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	12

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

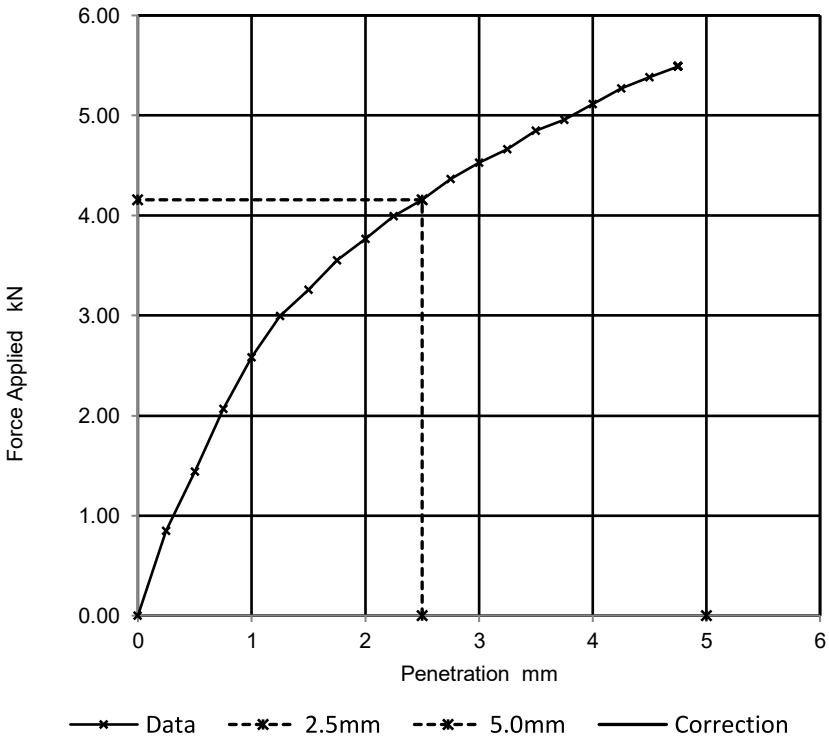
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	119	0.85
0.50	202	1.44
0.75	290	2.07
1.00	362	2.58
1.25	420	2.99
1.50	457	3.26
1.75	498	3.55
2.00	528	3.76
2.25	560	3.99
2.50	583	4.16
2.75	612	4.36
3.00	635	4.53
3.25	654	4.66
3.50	680	4.85
3.75	695	4.96
4.00	717	5.11
4.25	739	5.27
4.50	755	5.38
4.75	770	5.49
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	31	-	**31**	8.4

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Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR S4
Site Name	Eastergate			Depth m	0.20
Project No.	-	Client	Wilson Bailey	Date of Test	05/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	13

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

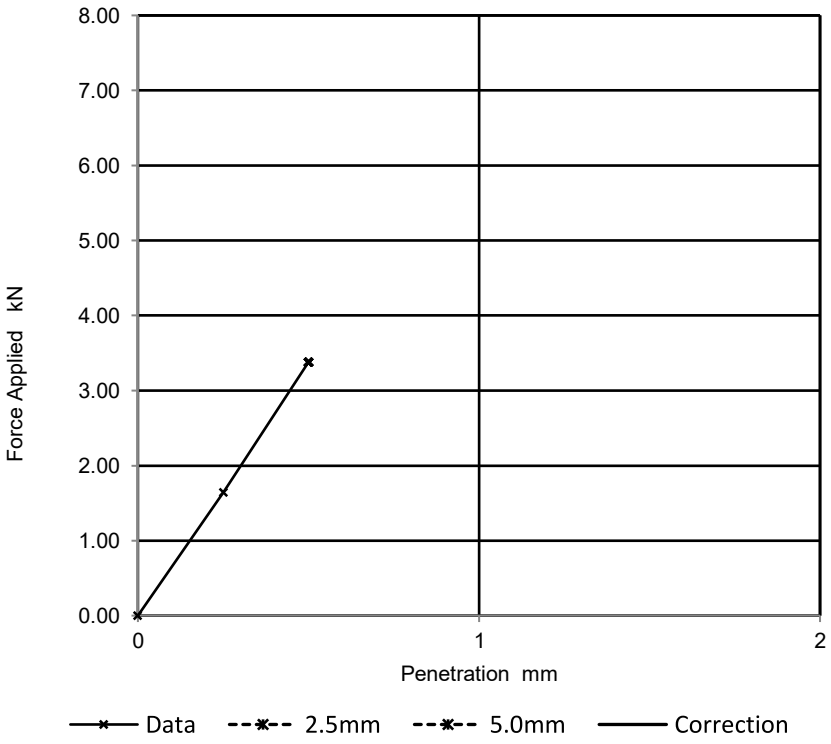
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	231	1.65
0.50	474	3.38
0.75		
1.00		
1.25		
1.50		
1.75		
2.00		
2.25		
2.50		
2.75		
3.00		
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	-	-	**>30**	7.0

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Initials: **J.P**

Date: 10/07/2018

In Situ California Bearing Ratio (CBR)

				Job Ref	24814
				CBR No.	CBR S5
Site Name	Eastergate			Depth m	0.20
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	14

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

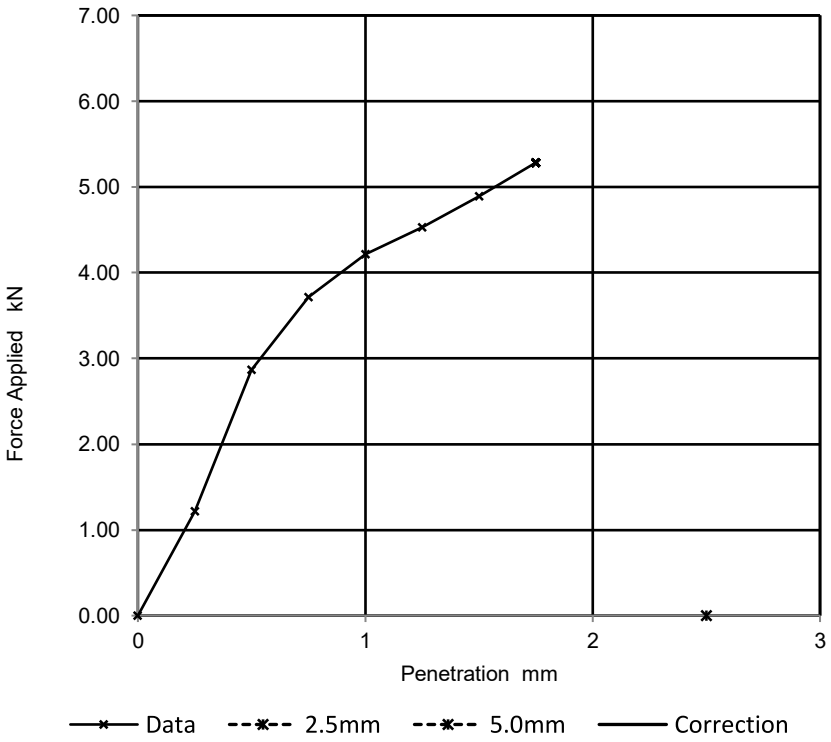
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	171	1.22
0.50	402	2.87
0.75	521	3.71
1.00	591	4.21
1.25	635	4.53
1.50	686	4.89
1.75	741	5.28
2.00		
2.25		
2.50		
2.75		
3.00		
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	-	-	**>30**	8.6

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Date: 10/07/2018

	In Situ California Bearing Ratio (CBR)			Job Ref	24814
				CBR No.	CBR S6
Site Name	Eastergate			Depth m	0.25
Project No.	-	Client	Wilson Bailey	Date of Test	04/07/2018
Soil Description	Brown gravelly clayey silty SAND with occasional rootlets (gravel is fmc and sub-angular to sub-rounded)				
Test Method	BS1377 : Part 9 : 1990, clause 4.3			CBR Test Number	15

Note: Test only applicable when maximum particle size beneath the plunger does not exceed 20mm

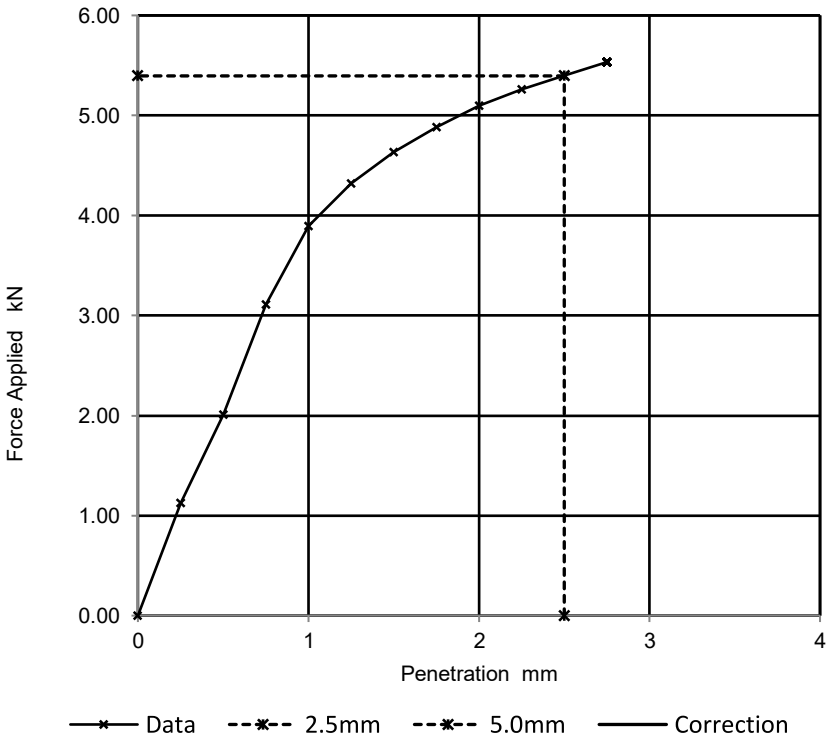
Rate if Strain	1.00	mm/min
Mass of Surcharge	4.6	kg
Proving Ring Factor	7.13	N/div

Temperature	26	0C
Environmental Conditions	Clear	

Readings

Penetration of Plunger mm	Force on Plunger: Dial Reading	Force on Plunger: Load kN
0.00	0	0.00
0.25	158	1.13
0.50	282	2.01
0.75	436	3.11
1.00	546	3.89
1.25	606	4.32
1.50	650	4.63
1.75	685	4.88
2.00	715	5.10
2.25	738	5.26
2.50	757	5.40
2.75	776	5.53
3.00		
3.25		
3.50		
3.75		
4.00		
4.25		
4.50		
4.75		
5.00		
5.25		
5.50		
5.75		
6.00		
6.25		
6.50		
6.75		
7.00		
7.25		
7.50		

Force versus Penetration Plot



Remarks

Maximum Kentledge Reached

Results

Curve correction applied	CBR Values, % Penetration 2.5mm	CBR Values, % Penetration 5mm	CBR Value	Moisture Content %
No	41	-	**41**	9.9

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