



Environmental Impact

Assessment Report (EIAR)

Volume 6 of 6: Appendices

(Appendix 10.10) BPS Ground Investigations

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WSP LOT 2, BOOSTER PUMPING STATION

GROUND INVESTIGATION CONTRACT FACTUAL REPORT

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Mott MacDonald Ireland,
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Dublin 16.

	Prepared by	Approved by	Rev. Issue Date:	Revision No.
	Ronan Killeen	Declan Joyce	30 th September 2022	21_OY_102/04
<u>Signature</u>	RK	DJ		

FOREWORD

The borehole, trial pit and dynamic sampling records have been compiled from an examination of the samples by a Geotechnical Engineer and from the Drillers' descriptions.

The report presents an opinion on the configuration of the strata within the site based on the borehole trial pit and dynamic sampling results. The assumptions, though reasonable, are given for guidance only and no liability can be accepted for changes in conditions not revealed by the boreholes, trial pits and dynamic samples.

The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930, 2015 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.

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7.1 Introduction.

The Water Supply Project (WSP) – Eastern and Midlands Region is a scheme to provide water from the River Shannon and pipe it east to the Dublin Region.

The proposed scheme extends from Parteen Basin in North Tipperary to Peamount Reservoir in West Dublin with a proposal to transport water approximately 170km.

The proposed civil works will include the construction of some or all of the following:

- Raw Water Abstraction Point.
- Raw Water Intake and Pumping Station.
- Raw Water Rising Main.
- Water Treatment Plant connected to the Raw Water Rising Main.
- A pressurised pipeline extending from the WTP to a new Break Pressure Tank (BPT).
- A gravity fed pipeline from the BPT to a Terminal Point Reservoir (TPR).

The geotechnical investigation works for the overall project has been divided into three lots as follows:

Lot 1 (Contract 1):

- Raw Water Intake
- Raw Water Rising Main
- Water Treatment Plant
- Pipeline Ch.0 to Ch36,000 (36km)

Lot 2 (Contract 2):

- Break Pressure Tank
- Pipeline Ch.36,000 to Ch. 103,000 (67km)

Lot 3 (Contract 3):

- Termination Point Reservoir
- Pipeline Ch. 103,000 to 170,000 (67km)

Irish Drilling Ltd. (IDL) has been awarded Lot 2 (Contract 2) and as part of this contract IDL has been instructed by Mott Macdonald Ireland, Consulting Engineers, on behalf of Irish Water to carry out a site investigation at the location of the proposed Booster Pumping Station Site.

This site investigation was carried out to provide detailed factual geotechnical information of the underlying ground conditions at the site.

The factual report issued here for the Booster Pumping Station Site will be collated with all other factual reports generated for the WSP Project (Lots 1 to 3) to provide the client with a factual report for the overall WSP Eastern and Midlands Region Project.

The fieldwork commenced on November 23rd 2021 and was completed on February 25th 2022.

7.2 Site & Geology

The site is located at Croagh Upper, Munny, County Offaly. Access to the site is directly off the R440 National Secondary Road.

The fieldwork was carried out predominantly on agricultural lands. Weather conditions in general were quite variable with the majority of the fieldwork carried out over a typical winter period in Ireland.

A Site Plan, prepared by the client's representatives and showing approximate 'As-Built' fieldwork locations, is included with this report.

The following were the main published information sources used:

Geological Map of Ireland: 1:500,000 scale map series.

Site investigation data is available as point source data along the proposed route, and the majority of the ground in between the points can only be assumed to follow the characteristics of the nearest available data.

Overview of Subsoil Geology

Estuarine Deposits:

These comprise of estuarine sands, gravels and silts from water borne deposits.

Glacial Till:

Glacial Till is what was often referred to as Boulder Clay. It is a diverse material that is largely deposited sub-glacially and has a wide range of characteristics due to the variety of parent materials and different processes of deposition. Tills are tightly packed, unsorted, heterogeneous, unbedded, and can have a wide range of particle sizes and types, which are often but not exclusively angular or sub-angular.

The type of parent material plays a critical role in providing the particles that create different subsoil permeability with sandstones giving rise to a high proportion of sand sized grains in the till matrix.

The Quarternary sediments are Till derived from limestone (Map Reference GSI: 1:50000).

Solid Geology

The Geological Map of Ireland: (GSI 1:100,000 scale map series) indicate that the site is underlain by mudstone and limestone rock of the Dinantian Waulsortian Limestone Formation.

Ground conditions encountered during the completion of the fieldwork were typical and as expected for this region and predominantly consisted of Glacial Tills.

The Glacial Tills in general consisted of slightly gravelly sandy silt/clay with cobbles and boulders and/or silty sands and/or gravels with cobbles and boulders.

Bedrock was not encountered in any of the rotary core boreholes before borehole termination and to a depth of up to 20.40m below ground level.

7.3 Fieldwork.

7.3.1 Fieldwork Plant:

The following plant was mobilised to site by IDL to carry out fieldwork operations:

- 1nr. Zaxis LCV 12T Tracked Excavator.
- 1nr. Dando 2000 Cable Percussive Boring Rig.
- 1nr. DeltaBase 520 Rotary Core Drilling Rig.
- 1nr. LD 400 Rotary Core Drilling Rig.
- 1nr. LMSR-V(k) Geotool Dynamic Probing Rig.
- 1nr. Yanmarr All-Terrain Support Vehicle.
- 1nr. GeoboreS Drill String.
- 1nr. HQ Rotary Core Drill String.
- 1nr. Permeability Test Equipment.
- 1nr. Honda Water Supply Pump.
- 1nr. Drilling Water Recirculation Tank System.

The following plant was mobilised to site by In-Situ Site Investigations Ltd. to carry out fieldwork operations:

- 1nr. High Pressure Dilatometer (HPD) Test Equipment.

Fieldwork carried out to date has included the following:

7.3.2 Fieldwork Operations:

A general summary of fieldwork operations carried out to date includes the following:

- Ecological Survey prior to mobilisation to site.
- Completion of 2nr GeoboreS Boreholes.
- Completion of 3nr Cable Percussive Boreholes.
- Completion of 7nr Cable Percussive with Rotary Core 'follow-on' Boreholes.
- Completion of 2nr dynamic (window) sampling locations.
- Completion of 1nr 'stand-alone' Rotary Core Borehole.
- Excavation of 24nr Trial Pits.
- Completion of 7nr Dynamic Probes.
- Completion of Standard Penetration Tests in overburden at borehole locations.
- Completion of 3nr Rising Head Permeability Tests at three borehole locations.
- Completion of 1nr Soil Infiltration Test to BRE 365.
- Installation of 4nr 50mm diameter standpipes at four borehole locations.

7.3.3 Ecological Survey:

Prior to mobilisation of plant and personnel to site an ecological survey was commissioned by IDL. The survey was carried out by Moore Group, Environmental Consultants, and their scope included a study/review of any ecological and/or environmental issues on site that may have been influenced by fieldwork operations.

A record of their observations was presented as a 'stand-alone' report and presented to the client's consultants prior to mobilisation to site.

7.3.4 Archaeological Survey:

Prior to mobilisation of plant and personnel to site an archaeological desktop study was commissioned by IDL. The study was carried out by Through Time Ltd and a summary of their study concluded that the site was not deemed an area of archaeological interest and as such the completion of fieldwork operations did not require the presence of an Archaeologist.

7.3.5 Cable Percussive Boreholes:

Three cable percussion (Shell & Auger) boreholes were completed using a Dando 2000 Cable Percussive Boring Rig. The boreholes were bored to 'refusal' or to depths as instructed by the client's representatives.

The three cable percussive boreholes are identified as follows:

BPS-BH006
BPS-BH007
BPS-BH010.

The borehole depths ranged from 5.00m to 6.70m below ground level.

In-Situ testing consisting of Standard Penetration Tests were carried out at regular intervals (predominantly 1.0m intervals) or as instructed by the client's representatives.

Disturbed bulk and jar soil samples were taken at each change in strata and were returned to the laboratory and logged by a Geotechnical Engineer and presented for testing. Groundwater samples were taken where possible and returned to the laboratory for storage and analysis.

Detailed engineering logs for the cable percussive boreholes completed are included with this report in Appendix 7A.

7.3.6 Cable Percussive with Rotary Core 'Follow-On' Boreholes:

Seven cable percussion (Shell & Auger) with rotary core 'follow-on' boreholes were completed using a Dando 2000 Cable Percussive Boring Rig and an LD 400 Rotary Core Drill Rig.

The seven boreholes are identified as follows:

BPS-BH001
BPS-BH002
BPS-BH003
BPS-BH004
BPS-BH008
BPS-BH009
BPS-BH012

The borehole depths ranged from 8.00m to 20.40m below ground level. The boreholes were carried out to establish overburden conditions and rockhead and to establish the nature and integrity of the underlying rock.

The cable percussive element of the boreholes were bored to 'refusal' or to depths as instructed by the client's representatives while the rotary core boreholes were carried out as 'follow-on' rotary core boreholes at locations where the cable percussive boreholes encountered relatively 'shallow' refusals.

In-Situ testing consisting of Standard Penetration Tests were carried out at regular intervals (predominantly 1.0m intervals) or as instructed by the client's representatives.

Disturbed bulk and jar soil samples were taken at each change in strata and were returned to the laboratory and logged by a Geotechnical Engineer and presented for testing. Groundwater samples were taken where possible and returned to the laboratory for storage and analysis.

The rotary core drilling was carried out using HQ size (64mm core diameter, 96mm hole diameter) drill strings with wireline drilling techniques were used to recover the core samples.

A water based flush system was used as the drilling medium while a biodegradable polymer gel was also used where necessary to aid the drilling and soil / rock recovery process.

The samples were stored in wooden boxes and returned to the laboratory where there were logged and photographed by a Geotechnical Engineer and presented for testing.

A 50mm diameter standpipe was installed in the following boreholes and as instructed by the Client's Engineer, to allow for monitoring of groundwater levels over a prolonged period of time: BPS BH001, BPS BH004 and BPS BH012.

Groundwater readings recorded during the completion of fieldwork activities are included with this report as Appendix 7J.

Variable Head Permeability Tests were carried out at two borehole standpipe locations (BPS BH004 and BH012) and the records of same are included as Appendix 7E, Part 2.

Detailed engineering logs for the cable percussive boreholes completed are included with this report in Appendix 7A.

7.3.7 Soils/Rock Rotary Core Boreholes (GeoboreS):

Two rotary core boreholes using GeoboreS drilling techniques were carried out to establish overburden conditions and rockhead and to establish the nature and integrity of the underlying rock.

The two boreholes completed are identified as follows:

BPS-BH005
BPS-BH011

The borehole depths ranged from 16.00m to 20.00m below ground level.

The rotary core boreholes were carried out as 'stand-alone' rotary core boreholes using wireline drilling techniques to recover soil and rock core samples.

GeoboreS drill strings ((101mm core diameter, 146mm hole diameter) were used to recover soil core samples in the overburden.

A water based flush system was used as the drilling medium while a biodegradable polymer gel was also used where necessary to aid the drilling and soil / rock recovery process.

The samples were stored in wooden boxes and returned to the laboratory where there were logged and photographed by a Geotechnical Engineer and presented for testing.

In-Situ testing consisting of Standard Penetration Tests were carried out in the overburden at regular intervals.

A 50mm diameter standpipe was installed in the following boreholes and as instructed by the Client's Engineer, to allow for monitoring of groundwater levels over a prolonged period of time: BPS BH011.

Groundwater readings recorded during the completion of fieldwork activities are included with this report as Appendix 7J.

A Variable Head Permeability Test was carried out at one borehole standpipe locations(BPS BH011) and the records of same are included as Appendix 7E, Part 2.

Detailed engineering logs for the cable percussive boreholes completed are included with this report in Appendix 7A.

7.3.8 Rotary Core Borehole:

One rotary core 'stand-alone' borehole was carried out to establish overburden conditions and rockhead and to establish the nature and integrity of the underlying rock.

The borehole completed is identified as follows:

BPS-DS001

The borehole was carried out to a depth of 8.00m below ground level.

HQ size (64mm core diameter, 96mm hole diameter) drill strings with wireline drilling techniques were used to recover the core samples

A water based flush system was used as the drilling medium while a biodegradable polymer gel was also used where necessary to aid the drilling and soil / rock recovery process.

The samples were stored in wooden boxes and returned to the laboratory where there were logged and photographed by a Geotechnical Engineer and presented for testing.

In-Situ testing consisting of Standard Penetration Tests were carried out in the overburden in a number of the boreholes.

A detailed engineering log for the rotary core 'stand-alone' borehole completed is included with this report in Appendix 7A.

7.3.9 Trial Pits:

Twenty-four trial pits were excavated on site using a 12T tracked excavator.

The twenty-four trial pits completed are identified as follows:

BPS-TP001	BPS-TP007	BPS-TP014	BPS-TP020
BPS-TP002	BPS-TP008	BPS-TP015	BPS-TP025
BPS-TP003	BPS-TP009	BPS-TP016	BPS-TP026
BPS-TP004	BPS-TP010	BPS-TP017	BPS-TP027
BPS-TP005	BPS-TP011	BPS-TP018	BPS-TP028
BPS-TP006	BPS-TP012	BPS-TP019	BPS-TPINF001

The pits were logged and photographed by an Engineer with observations made on ground conditions, pit stability, water ingress and services encountered. The pits were excavated to depths ranging from 1.50m to 4.50m below ground level.

Small and bulk disturbed soil samples were recovered at each change in strata and returned to the laboratory and presented for testing.

In-Situ tests consisting of hand shear vane tests were also carried out where possible in cohesive soils and a summary of the shear vane test results are included on the engineering logs.

Detailed engineering logs for the trial pits completed are included with this report in Appendix 7C.

A soil infiltration test was carried out at one location (BPS TPINF001) in accordance with BRE 365 and the records of same are included as Appendix 7E, Part 1.

In-Situ tests consisting of plate bearing tests were carried out at four trial pit locations (BPS-TP 010, BPS-TP012, BPS-TP018 and BPS-TP020) and the records of same are included as Appendix 7E, Part 3.

7.3.10 Dynamic Probing:

Seven dynamic probes (Dynamic Probe Heavy, DPH) were carried out to 'refusal' using a LMSR-V(k) Geotool Dynamic Probing Rig.

The seven probes completed are identified as follows:

BPS-DPTP002	BPS-DPTP014	BPS-DPTP026
BPS-DPTP006	BPS-DPTP015	BPS-DS001
BPS-DS002		

The dynamic probe was carried out to depths ranging from 2.70m to 5.00m below ground level.

The Dynamic Probing Rig involves the dropping of a 50 kg hammer onto rods from a standard height (500mm) and recording the number of blows it takes to penetrate the rods (with a cone tip) to depth of 100mm increments into the soil.

The dynamic probe engineering logs then graph the number of blow counts required to penetrate each 100mm incremental depth. The probe is considered to have encountered 'refusal' when a blow count of 25 does not achieve the full 100mm incremental depth.

Detailed engineering logs for the dynamic sampling completed are included with this report in Appendix 7B.

7.3.11 Dynamic Sampling:

Two dynamic sampling probe holes were carried out to 'refusal' using a LMSR-V(k) Geotool Dynamic Probing Rig.

The two probes completed are identified as follows:

BPS-DS001
BPS-DS002

Windowless samples are retrieved by pushing the rods to depth using rig hydraulics with the sample recovered in a seamless plastic liner contained within the rods. The plastic liner is then extracted from the rods once target sample depth is reached.

The windowless sampling was carried out to depths ranging from 1.10m to 1.8m below ground level.

Detailed engineering logs for the dynamic sampling completed are included with this report in Appendix 7B.

7.3.12 General Summary:

The borehole locations were set out on site using a Trimble CU Bluetooth GPS Surveying Unit and the co-ordinates are included on the logs presented in the appendices.

All fieldwork co-ordinates are reported to Irish Transverse Mercator (ITM) with Reduced Levels recorded relative to Malin Head Datum and with an accuracy level of + or – 0.10m.

The fieldwork was carried out in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations with precedence given to IS EN 1997-2 where applicable.

7.4 Laboratory Testing

Representative samples recovered from the boreholes and trial pits were scheduled for testing in the laboratory.

The test schedules were prepared by the Client's Engineer and included the following tests on bulk disturbed soil samples and/or undisturbed soil samples:

Test Type:	Number of Tests
Moisture Content	61
Atterberg Limits	66
Particle Size Distribution	102
Hydrometer	65
BRE, Suite B	21
Moisture Condition Value	12
CBR	10
Compaction (Light/Heavy)	5
Small Direct Shearbox	5
Moisture Condition Relationship	3

The test schedules also included the following tests on rock core samples:

Test Type	Number of Tests
Uniaxial Compression Strength (UCS)	0
Point Load	0

The test schedules also included the following tests on groundwater samples:

Test Type	Number
Mott MacDonald Groundwater Suite	0
Maximum Allowable LODs	0

The test schedules were carried out predominantly at the IDL Laboratory located at Loughrea, County Galway.

A number of specialist tests not available at the IDL laboratory were carried out by designated laboratories on a subcontract basis as follows:

Laboratory chemical tests (BRE) were carried out by ALS Ltd., Hawarden, UK. These tests were carried out in accordance with Suite B of Specification and Related Documents for Ground Investigation in Ireland, 2016.

Shear Strength, Triaxial and Consolidation (Oedometer) Tests were carried out by NMTL, Carlow, County Carlow.

Groundwater samples tests (Mott MacDonald Groundwater Suite and Maximum Allowable LODs) if scheduled were also carried out by ALS Ltd., Hawarden, UK.

ALS Ltd., Hawarden, UK is accredited to ISO/IEC 17025:2017 (UKAS).

Soil samples (disturbed and undisturbed) in general were recovered from the excavation of trial pits and completion of cable percussive boreholes. Soil and/or rock core samples were recovered from the completion of rotary core boreholes and the records of the laboratory test results carried out on same are reported in Appendix 7H.

The soil and rock descriptions as noted on the borehole and trial pit logs are in general visual descriptions as observed and logged by our Engineers and are described in accordance with IS EN 1997-2 and BS5930:2015+A1:2020 Code of Practice for Site Investigations.

Soils descriptions (cohesive or otherwise) are also initially assessed based on the texture and 'feel' of the soil materials as witnessed by our Geotechnical Engineers and in accordance with IS EN 1997-2 and BS5930:2015+A1:2020.

Where laboratory classification tests have been carried out on soil and/or rock samples then these visual descriptions have been amended accordingly to take into account the results of these classification tests.

The records of all fieldwork, laboratory test results and photographs are included in the appendices of this Factual Report.

Ronan Killeen

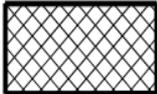
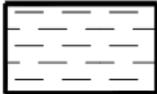
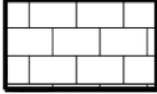
Ronan Killeen
Chartered Engineer
Irish Drilling Limited
September 30th 2022



Appendix 7A

Borehole Records

The following Key Legend Table details the symbology used in general on the engineering logs to describe ground conditions encountered:

Legend:	
	Made ground=mg
	Clay=cl
	Boulders and cobbles=b/c
	Gravel=g
	Peat=p
	Sand=s
	Silty sand=s/si
	Silt=si
	Rock=r



Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH001	
Job No 2021OY102		Date 28-01-22 15-02-22		Ground Level (m OD) 86.65		Co-Ordinates () E 615,303.2 N 707,144.8	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: Rose to (@ 20 min.): Sealed at: 1st: dry 2nd: 3rd:		Sheet 1 of 3 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-5.00	C							
0.00-1.00	B1		86.25		(0.40) 0.40	TOPSOIL: Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse of limestone.		
1.00	CPT	N = 29 (4, 3, 8, 8, 7, 6)				Brown very silty very sandy sandy subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content and low boulder content. Sand is fine to coarse. Cobbles are subrounded to rounded fine to coarse of limestone. Boulders are of limestone. 1.00m; becoming medium dense.		
1.00	D2							
1.00-1.50	B4							
1.50	D5							
2.00	CPT	N = 44 (8, 7, 10, 17, 9, 8)				2.00m: becoming dense		
2.00-2.50	B7							
2.50	D8							
3.00	CPT	N = 25 (3, 4, 4, 5, 7, 9)			(5.10)	3.00m: becoming medium dense.		
3.00-3.50	B10							
3.50	D11							
4.00	CPT	N = 26 (4, 5, 4, 6, 8, 8)						
4.00-4.50	B13							
4.50	D14							
5.00	CPT	N = 61 (7, 7, 8, 10, 10, 33)				5.00m; becoming very dense.		
5.00-6.50	C							
5.00-5.50	B16		81.15		5.50	Borehole continued as a Cored Drillhole		

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
28-01-22	14.00	5.50	5.50	203	dry	2.4 5.5	2.6 5.5	1 1			

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		DRILLHOLE No BPS-BH001
Job No 2021OY102	Date 28-01-22 15-02-22	Ground Level (m OD) 86.65	Co-Ordinates () E 615,303.2 N 707,144.8		
Engineer Mott MacDonald				Sheet 2 of 3 Rev. FINAL	

RUN DETAILS					STRATA			Geology	Instrument/ Backfill	
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
28.01	33 (-) -	NA 8.00(50/70mm)	81.15		5.50	5.50 - 15.50 m: overburden		Very dense subangular to subrounded fine to coarse rare quartz and assorted grey limestone GRAVEL.		
6.50	20 (-) -		8.00		(5.50)					
9.50	20 (-) -		9.50(50/40mm)							
11.00	20 (-) -		11.00(50/30mm)		75.65					
12.50	13 (-) -	NA			(3.00)			Very stiff light brown slightly sandy SILT. Sand is fine.		
	20 (-) -									

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations						Rotary Flush				GENERAL REMARKS		
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Strike	Water Standing	From (m)	To (m)		Type	Return (%)
28-01-22	14.00	5.50	5.50	203			dry					50mm standpipe installed. Response zone 11.50m to 15.00m bgl.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH002	
Job No 2021OY102		Date 02-02-22 16-02-22		Ground Level (m OD) 86.78		Co-Ordinates () E 615,327.6 N 707,124.6	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: Rose to (@ 20 min.): Sealed at: 1st: 6.20m 5.10m 2nd: 3rd:		Sheet 1 of 2 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-1.50 0.00-1.00	C B1		86.28	(0.50)	0.50	TOPSOIL: Grass over firm brown gravelly silty CLAY with cobbles and rootlets. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are rounded of limestone.		
1.00 1.00 1.00-1.50 1.50-2.00 1.50	CPT D2 B4 C D5	N = 54 (4, 7, 6, 11, 16, 21)	84.78	(1.50)	1.50	Brown very silty very sandy coarse GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are subrounded to rounded fine to coarse of grey limestone. 1.00m: becoming very dense.		
2.00 2.00-3.50 2.00-2.50 2.50	CPT C B7 D8	N = 32 (5, 5, 7, 8, 8, 9)	82.58	(2.20)	2.20	Dense brown silty very sandy medium and coarse GRAVEL. Sand is fine to coarse.		
3.00 3.00-3.50 3.50-5.00 3.50	CPT B10 CPT D11	N = 35 (6, 5, 8, 9, 9, 9)	80.58	(2.00)	2.00	Very dense very silty very sandy fine to coarse GRAVEL with medium cobble content. Gravel is subangular to subrounded of assorted grey limestone. Cobbles are subrounded to rounded of assorted grey limestone. 5.00m: medium dense.		
4.00 4.00-4.50 4.50	CPT B13 D14	N = 66 (3, 4, 5, 19, 18, 24)						
5.00 5.00-6.50 5.00-5.50 5.50	CPT C B16 D17	N = 28 (4, 5, 7, 7, 6, 8)						
6.00 6.00-6.30	CPT B19	50 for 135 mm (25, -, 31, 19)				Borehole continued as a Cored Drillhole		

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
02-02-22	15.00	6.30	6.00	203	5.00	1.4	1.7	1			BH backfilled.
16-02-22	13.00	8.00	1.50			4.5	4.8	1			
						6.2	6.3	1			

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH003	
Job No 2021OY102		Date 01-02-22 08-02-22		Ground Level (m OD) 86.51		Co-Ordinates () E 615,321.5 N 707,091.7	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: Rose to (@ 20 min.): Sealed at: 1st: dry 2nd: 3rd:		Sheet 1 of 3 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-4.50 0.00-1.00	C B1				(0.60)	TOPSOIL: Grass over firm brown slightly gravelly silty CLAY with cobbles. Gravel is subrounded to rounded fine to coarse of sandstone and assorted grey limestone limestone. Cobbles are subrounded to rounded of sandstone and limestone.		
1.00 1.00-1.50 1.50	CPT D2 B4 D5	N = 39 (8, 9, 8, 10, 10, 11)	85.91		(1.20)	Brown silty very sandy subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content and low boulder content. Sand is fine to medium. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. 1.00m: becoming dense.		
2.00 2.00-2.50 2.50	CPT B7 D8	N = 31 (5, 8, 9, 8, 7, 7)	84.71		(1.10)	Dense brown very gravelly very silty fine to medium SAND with cobbles. Cobbles are rounded of grey limestone. Gravel is subangular to rounded fine to coarse of assorted grey limestone.		
3.00 3.00-3.50 3.50	CPT B10 D11	N = 21 (4, 3, 5, 5, 5, 6)	83.61		(2.90)	Medium dense brown silty very sandy fine to coarse GRAVEL. Sand is fine to medium. Gravel is subangular to rounded of assorted grey limestone.		
4.00 4.00-4.50 4.50-6.10 4.50	CPT B13 C D14	52 for 241 mm (6, 5, 10, 16, 18, 8)			(2.55)	4.00m; becoming very dense.		
5.00 5.00-5.50	CPT B16	50 for 225 mm (8, 9, 9, 17, 24)	81.06		5.45			
Borehole continued as a Cored Drillhole								

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL.TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
01-02-22	14.00	5.60	5.50	203	dry	1.6	1.9	1			BH backfilled.
						4.4	4.7	1			
						5.45	5.6	1			

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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Irish drilling LTD

DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		DRILLHOLE No BPS-BH003	
Job No 2021OY102	Date 01-02-22 08-02-22	Ground Level (m OD) 86.51	Co-Ordinates () E 615,321.5 N 707,091.7				Sheet 2 of 3
Engineer Mott MacDonald						Rev. FINAL	

RUN DETAILS					STRATA			Geology	Instrument/ Backfill	
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
01.02 01.02			81.06		5.45	5.45 - 15.00 m: overburden				
6.10						7.20m: becoming very dense.				
7.20	36 (-) -	7.20(50/150mm)								
8.50	46 (-) -	8.50(50/214mm)								
08.02 08.02			76.51		10.00	Very dense brown silty fine SAND.				
10.10		10.10(50/226mm)								
11.50	28 (-) -									
13.10	13 (-) -	13.10(50/161mm)			(5.00)					

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
01-02-22	14.00	5.60	5.50	203			dry					BH backfilled.
08-02-22	16.30	10.00	4.50									

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH004	
Job No 2021OY102		Date 31-01-22 09-02-22		Ground Level (m OD) 86.97		Co-Ordinates () E 615,344.2 N 707,103.1	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: 1st: 5.20m 2nd: 3rd: Rose to (@ 20 min.): 4.00m Sealed at:		Sheet 1 of 2 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-6.00 0.00-1.00	C B1		86.47	(0.50)	0.50	TOPSOIL: Grass over firm brown slightly gravelly silty CLAY with cobbles. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subrounded to rounded limestone.		
1.00 1.00-1.50 1.50	CPT D2 B4 D5	N = 51 (8, 5, 10, 15, 16, 10)			(3.60)	Grey brown very silty very sandy subrounded to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content and medium boulder content. Sand is fine to coarse. Cobbles are subrounded to rounded of assorted grey limestone. Boulders are subrounded to rounded of limestone. 1.00m: becoming very dense.		
2.00 2.00-2.50 2.50	CPT B7 D8	N = 37 (6, 6, 8, 9, 9, 11)				2.00m: becoming dense.		
3.00 3.00-3.50 3.50	CPT B10 D11	N = 38 (5, 5, 4, 7, 9, 18)						
4.00 4.00-4.50 4.50	CPT B13 D14	N = 14 (3, 2, 3, 4, 4, 3)	82.87		(1.10)	Firm damp brown slightly gravelly sandy SILT. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of assorted grey limestone.		
5.00 5.00-5.50 5.50	CPT B16 D17	N = 41 (4, 3, 8, 8, 11, 14)	81.77		(1.50)	Dense grey silty very sandy subrounded to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are angular of limestone.		
6.00 6.00-7.20 6.00-6.50 6.50	CPT C B19 D20	N = 46 (8, 7, 10, 10, 11, 15)	80.27		6.70			
Borehole continued as a Cored Drillhole								

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
31-01-22	16.00	6.80	6.70	203	5.10	3.45 6.7	3.7 6.8	1 1			Falling head test expedited in BH. 50mm standpipe installed. Response zone 11.00m to 14.40m.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		DRILLHOLE No BPS-BH005
Job No 2021OY102	Date 22-02-22 23-02-22	Ground Level (m OD) 86.69	Co-Ordinates () E 615,322.2 N 707,144.0		
Engineer Mott MacDonald				Sheet 1 of 3 Rev. FINAL	

RUN DETAILS						STRATA			Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
0.00	0 (-) -	NA			(1.00)	0.00 - 20.00 m: overburden				
1.00			85.69		1.00					
2.00	10 (-) -				(5.50)	Subangular to subrounded fine to coarse brown sandstone, brown dolomitised limestone and assorted grey limestone GRAVEL with medium cobble content and some brown slightly sandy gravelly silt. Sand is coarse. Cobbles are of assorted grey limestone. 2.50m: becoming very dense.				
3.50	7 (-) -	2.50(50/150mm)								
5.00	13 (-) -	4.00(50/150mm)								
6.50	13 (-) -	6.50(50/75mm)	80.19							
8.00	7 (-) -					Very dense brown speckled black slightly gravelly fine and medium SAND. Gravel is subangular to subrounded fine to coarse of assorted grey limestone.				

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)		
							0	20.00	polymer	100	10 litres polydrill used. BH backfilled.	

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Hydreq	Bit Design	Driller DK	Logged By EAT
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DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		DRILLHOLE No BPS-BH005
Job No 2021OY102	Date 22-02-22 23-02-22	Ground Level (m OD) 86.69	Co-Ordinates () E 615,322.2 N 707,144.0		
Engineer Mott MacDonald				Sheet 2 of 3 Rev. FINAL	

RUN DETAILS					STRATA			Geology	Instrument/ Backfill	
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
9.50	13 (-)	8.00 (50/0mm)		o	(6.00)			Very dense brown speckled black slightly gravelly fine and medium SAND. Gravel is subangular to subrounded fine to coarse of assorted grey limestone. <i>(continued)</i>		
11.00	13 (-)	9.5(50/150mm)		o						
12.50	13 (-)	NA		o						
12.50		12.50 (50/0mm)	74.19	o	12.50					
13.10			73.59	o	(0.60)			Very stiff orangish brown CLAY.		
14.00	60 (-)			x	(0.90)			Orangish brown silty fine SAND.		
14.20			72.69	x	14.00					
14.20			72.49	x	14.20			Orangish brown CLAY.		
15.50	53 (-)			x	(2.80)			Stiff light orangish brown slightly gravelly sandy SILT. Sand is fine. Gravel is subangular fine to coarse of assorted grey limestone.		
		15.50 (52)		x				15.50m: becoming very stiff.		

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
22-02-22	17.30	12.50	3.00	150	102							10 litres polydrill used. BH backfilled.
23-02-22	08.30	12.50	3.00	150	102							

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Hydreq	Bit Design	Driller DK	Logged By EAT
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH006	
Job No 2021OY102		Date 04-02-22 04-02-22		Ground Level (m OD) 87.38		Co-Ordinates () E 615,323.9 N 707,172.0	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: 1st: 5.00m Rose to (@ 20 min.): 4.70m 2nd: 3rd:		Sheet 1 of 1 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-1.00	B1		86.88	(0.50)	0.50	TOPSOIL: Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse of assorted grey limestone.		
1.00	CPT	N = 65 (4, 5, 19, 20, 16, 10)				Dense brown silty very sandy coarse GRAVEL with high cobble content and low boulder content. Sand is fine to medium. Gravel is subangular to rounded of assorted grey limestone. Cobbles are subrounded to rounded limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of grey limestone. 1.00m: becoming very dense.		
1.00	D2							
1.00-1.50	B4							
1.50	D5							
2.00	CPT	N = 30 (5, 6, 5, 8, 8, 9)			(4.40)	2.00m: becoming dense.		
2.00-2.50	B7							
2.50	D8							
3.00	CPT	N = 37 (9, 8, 7, 9, 10, 11)						
3.00-3.50	B10							
3.50	D11							
4.00	CPT	N = 36 (4, 5, 10, 8, 8, 10)						
4.00-4.50	B13							
4.50	D14							
4.90	CPT	50 for 0 mm (25, -, 50)	82.48 82.38		4.90 5.00	Obstruction as probable limestone BOULDER. BH terminated at 5.00m bgl. Obstruction as probable boulder.		

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
04-02-22	14.00	5.00	5.00	203	4.30	1.6 4.9	1.9 5	1 1			BH backfilled.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Dando 2000	Bit Design	Driller BT	Logged By EAT
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BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH007	
Job No 2021OY102		Date 03-02-22 03-02-22		Ground Level (m OD) 86.90		Co-Ordinates () E 615,346.1 N 707,145.9	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: 1st: 6.00m 2nd: 5.00m 3rd: 5.00m		Rose to (@ 20 min.): 5.00m Sealed at: Sheet 1 of 1 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-1.00	B1				(0.60)	TOPSOIL: Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse of limestone.		
1.00	CPT	N = 72 (4, 5, 8, 15, 24, 25)			0.60	Brown very sandy very silty subrounded to rounded fine to coarse assorted grey limestone GRAVEL with high cobble content. Sand is fine to coarse. Cobbles are subrounded to rounded of assorted grey limestone. 1.00m: becoming very dense.		
1.00-1.50	D2 B4 D5							
2.00	CPT	N = 28 (3, 5, 5, 6, 8, 9)				2.00m: becoming medium dense.		
2.00-2.50	B7							
2.50	D8							
3.00	CPT	N = 30 (5, 7, 6, 6, 9, 9)			(5.40)	3.00m: becoming dense.		
3.00-3.50	B10							
3.50	D11							
4.00	CPT	N = 33 (4, 45, 7, 7, 9, 10)				4.00m: becoming medium dense.		
4.00-4.50	B13							
4.50	D14							
5.00	CPT	N = 35 (8, 9, 6, 8, 10, 11)				5.00m: becoming dense.		
5.00-5.50	B16							
5.50	D17							
6.00	CPT	50 for 0 mm (25, -, 50)			6.00	Obstruction as probable limestone BOULDER. BH terminated at 6.10m bgl. Obstruction as probable boulder.		
					80.90			
					80.80			

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
03-02-22	15.00	6.10	6.00	203	5.10	1.45	1.7	1			BH backfilled.
						6	6.1	1			

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Dando 2000	Bit Design	Driller BT	Logged By EAT
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH008	
Job No 2021OY102		Date 26-01-22 10-02-22		Ground Level (m OD) 87.21		Co-Ordinates () E 615,353.3 N 707,129.2	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: Rose to (@ 20 min.): Sealed at: 1st: dry 2nd: 3rd:		Sheet 1 of 3 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-4.50 0.00-1.00	C B1					TOPSOIL: Grass over firm brown silty CLAY with cobbles. Cobbles are subangular to rounded limestone.		
1.00	CPT	N = 61 (4, 8, 17, 18, 24, 2)	86.61		(0.60) 0.60	Grey brown silty very sandy subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. 1.00m: becoming very dense.		
1.00-1.50	D2 B4 D5					2.00m; becoming medium dense.		
2.00	CPT	N = 26 (5, 5, 6, 7, 5, 8)				3.00m: becoming dense.		
2.00-2.50	B7					4.00m; becoming medium dense.		
2.50	D8					5.00m; becoming dense.		
3.00	CPT	N = 31 (4, 5, 7, 7, 8, 9)			(5.40)	Very dense greyish brown wet subrounded to rounded limestone COBBLES.		
3.00-3.50	B10					Borehole continued as a Cored Drillhole		
3.50	D11							
4.00	CPT	N = 24 (4, 6, 5, 6, 7, 6)						
4.00-4.50	B13							
4.50-5.40	C D14							
4.50	D14							
5.00	CPT	N = 36 (6, 8, 7, 10, 9, 10)						
5.00-5.50	B16							
5.40-7.00	C							
5.50	D17							
6.00	CPT	61 for 235 mm (5, 9, 7, 18, 21, 15)	81.21		(0.40) 6.40			
6.00-6.50	B19		80.81					

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
26-01-22	15.00	6.50	6.50	203	5.90	0.6	0.9	1			BH backfilled.
						1.4	1.7	1			

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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Irish drilling LTD

DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		DRILLHOLE No BPS-BH008
Job No 2021OY102	Date 26-01-22 10-02-22	Ground Level (m OD) 87.21	Co-Ordinates () E 615,353.3 N 707,129.2		
Engineer Mott MacDonald				Sheet 2 of 3 Rev. FINAL	

RUN DETAILS					STRATA			Geology	Instrument/ Backfill		
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION					
						Discontinuities	Detail	Main			
26.01 26.01			80.81		6.40	6.40 - 20.40 m: overburden		Subrounded to subangular fine to coarse assorted grey limestone GRAVEL with low cobble content and some stiff dark brown slightly sandy slightly gravelly silt. Sand is fine to coarse. Gravel is subangular fine of assorted grey limestone.			
7.00											
8.40	57 (-) -								8.40m: very dense.		
10.00	44 (-) -	8.40(50/30mm)				(5.00)					
11.40	14 (-) -	10.00(50/40mm)									
13.00	63 (-) -		75.81					Very stiff orangish brown slightly sandy SILT. Sand is fine.			
14.40	78 (-) -	11.40(75/120mm)				(4.80)					

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
26-01-22	15.00	6.50	6.50	203			5.90					BH backfilled.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH009	
Job No 2021OY102		Date 25-01-22 11-02-22		Ground Level (m OD) 87.24		Co-Ordinates () E 615,359.4 N 707,163.7	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: Rose to (@ 20 min.): Sealed at: 1st: dry 2nd: 3rd:		Sheet 1 of 3 Rev. FINAL	

SAMPLES & TESTS			STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend (Thickness)	DESCRIPTION		
0.00-3.00 0.00-1.00	C B1			86.84	(0.40) 0.40	TOPSOIL: Grass over firm brown silty CLAY with rootlets.		
1.00 1.00-1.50 1.50	CPT D2 B4 D5	50 for 0 mm (25, -, 50)		85.54	(1.30) 1.70	Brown grey very silty very sandy subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content and low boulder content. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. 1.00m; becoming very dense.		
2.00 2.00-2.50 2.50	CPT B7 D8	N = 31 (4, 8, 6, 8, 8, 9)			(2.30)	Damp brown very silty very sandy subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content. Cobbles are subrounded to rounded of grey limestone. 2.00m: becoming dense.		
3.00 3.00-4.00 3.00-3.50 3.50	C B10 D11	N = 30 (3, 5, 7, 7, 6, 10)		83.24	4.00	Borehole continued as a Cored Drillhole		

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
25-01-22	13.00	4.00	4.00	203	3.80	1.1	1.5	1			BH backfilled.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22



Irish drilling LTD

DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		DRILLHOLE No BPS-BH009
Job No 2021OY102	Date 25-01-22 11-02-22	Ground Level (m OD) 87.24	Co-Ordinates () E 615,359.4 N 707,163.7		
Engineer Mott MacDonald				Sheet 3 of 3 Rev. FINAL	

RUN DETAILS					STRATA			Geology	Instrument/ Backfill	
Depth Date	TCR (SCR) ROD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
12.90	20 (-) -	NA	74.54		12.70					
14.40	33 (-) -	14.40(50/15mm)			(2.30)			Very stiff orangish brown slightly sandy SILT. Sand is fine.		
15.00	33 (-) -		72.24			15.00			BH terminated at 15.00m bgl on REs instruction.	

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
11-02-22	16.00	15.00	3.00									BH backfilled.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH010	
Job No 2021OY102		Date 24-01-22 24-01-22		Ground Level (m OD) 87.46		Co-Ordinates () E 615,341.9 N 707,173.4	
Engineer Mott MacDonald				GROUNDWATER STRIKES		Water strikes: Rose to (@ 20 min.): Sealed at: 1st: 5.20m 4.00m 2nd: 3rd:	
						Sheet 1 of 1 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-1.00	B1		87.06		(0.40) 0.40	TOPSOIL: Grass over firm brown silty CLAY.		
1.00	CPT	N = 38 (5, 8, 6, 8, 7, 17)				Brown slightly sandy very silty subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content and low boulder content. Cobbles are subrounded to rounded of grey limestone. Boulders are of grey limestone. 1.00m; becoming dense.		
1.00	D2							
1.00-1.50	B4							
1.50	D5							
2.00	CPT	N = 22 (4, 4, 5, 4, 6, 7)			(4.60)	2.00m: becoming medium dense.		
2.00-2.50	B7							
2.50	D8							
3.00	CPT	N = 29 (5, 10, 8, 7, 6, 8)						
3.00-3.50	B10							
3.50	D11							
4.00	CPT	N = 32 (8, 8, 7, 6, 10, 9)				4.00m; becoming dense.		
4.00-4.50	B13							
4.50	D14							
5.00	CPT	N = 30 (3, 5, 5, 8, 9, 8)	82.46		5.00			
5.00-5.50	B16		82.26		5.20	Stiff brown slightly sandy slightly gravelly SILT with medium cobble content. Gravel is subangular to rounded fine to coarse assorted grey limestone. Cobbles are subrounded to rounded of grey limestone.		
5.50	D17		81.76		(0.50) 5.70	Dense brown slightly silty sandy subangular to subrounded fine to coarse assorted grey limestone GRAVEL. Sand is fine to coarse.		
6.00	CPT	52 for 235 mm (6, 7, 5, 10, 18, 19)			(0.90)	Very stiff brown slightly sandy gravelly SILT with high cobble content. Cobbles are subangular to subrounded assorted grey limestone. Sand is fine to coarse.		
6.00-6.50	B19					Gravel is subangular to rounded fine to coarse of assorted grey limestone.		
6.50	D20		80.86		6.60			
6.60	CPT	50 for 0 mm (25, -, 50)	80.76		6.70	Obstruction as probable limestone BOULDER. BH terminated at 6.70m bgl. Obstruction as probable boulder.		

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
24-01-22	16.00	6.70	6.50	203	4.70	1.4	1.7	1			BH backfilled.
						4.6	4.9	1			
						6.6	6.7	1			

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used	Dando 2000/DB520	Bit Design	Driller BT	Logged By EAT
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DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		DRILLHOLE No BPS-BH011
Job No 2021OY102	Date 24-02-22 25-02-22	Ground Level (m OD) 88.17	Co-Ordinates () E 615,340.3 N 707,190.3		
Engineer Mott MacDonald				Sheet 1 of 3 Rev. FINAL	

RUN DETAILS						STRATA			Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
0.00	0 (-)	NA			(2.50)	0.00 - 16.00 m: overburden				
2.50			85.67		2.50	Very stiff orangish brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subrounded to subangular fine to coarse of assorted grey limestone. Cobbles are of assorted grey limestone.				
4.00	53 (-)	2.50 (52)								
5.50	73 (-)	4.00(50/75mm)								
7.00	67 (-)	5.50(50/75mm)								
	67 (-)	7.00 (50/0mm)			(9.00)					

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia	Core Dia mm	Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
								0	16.00	polymer	100	10 litres polydrill used. 50mm standpipe installed. Response zone 2.50m to 6.50m bgl. Rising head permeability test carried out in standpipe.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Hydreq	Bit Design	Driller DK	Logged By EAT
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Irish drilling LTD

DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		DRILLHOLE No BPS-BH011	
Job No 2021OY102		Date 24-02-22 25-02-22		Ground Level (m OD) 88.17		Co-Ordinates () E 615,340.3 N 707,190.3	
Engineer Mott MacDonald						Sheet 2 of 3 Rev. FINAL	

RUN DETAILS					STRATA			Geology	Instrument/ Backfill		
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION					
						Discontinuities	Detail	Main			
8.50		8.50(50/75mm)						Very stiff orangish brown sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subrounded to subangular fine to coarse of assorted grey limestone. Cobbles are of assorted grey limestone. <i>(continued)</i>			
	100 (-)	NA									
10.00		10.00 (50/0mm)									
	87 (-)										
11.50		11.50 (50/0mm)	76.67		11.50						
	73 0			(1.50)				Very stiff orangish brown slightly gravelly sandy CLAY. Sand is fine. Gravel is subrounded to subangular fine to coarse of assorted grey limestone.			
13.00		13.00 (50/0mm)	75.17	13.00							
	73 0			(3.00)				Very dense light orangish brown silty fine and medium SAND.			
14.50											
	80 0										
16.00			72.17	16.00							

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia	Core Dia mm	Water Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
24-02-22	17.30	11.50	2.50	150	102							10 litres polydrill used. 50mm standpipe installed. Response zone 2.50m to 6.50m bgl. Rising head permeability test carried out in standpipe.
25-02-22	08.30	11.50	2.50	150	102							
25-02-22	14.00	16.00	2.50	150	102							

All dimensions in metres Scale 1:50		Client: Irish Water		Method/ Plant Used Hydreq			Bit Design		Driller DK		Logged By EAT	
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Irish drilling LTD

BOREHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		BOREHOLE No BPS-BH012	
Job No 2021OY102		Date 27-01-22 14-02-22		Ground Level (m OD) 88.92		Co-Ordinates () E 615,367.9 N 707,200.5	
Engineer Mott MacDonald				GROUNDWATER STRIKES Water strikes: Rose to (@ 20 min.): Sealed at: 1st: dry 2nd: 3rd:		Sheet 1 of 3 Rev. FINAL	

SAMPLES & TESTS			Water	STRATA			Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		
0.00-4.50 0.00-1.00	C B1						TOPSOIL: Grass over firm brown silty CLAY.	
			88.42		(0.50) 0.50			
1.00 1.00-1.50 1.50	CPT D2 B4 D5	N = 29 (4, 7, 5, 10, 7, 7)					Brown very silty fine to coarse SAND and subrounded to rounded fine to coarse assorted grey limestone GRAVEL with high cobble content. Cobbles are subrounded to rounded of limestone. 1.00m: becoming medium dense.	
2.00 2.00-2.50 2.50	CPT B7 D8	N = 17 (3, 2, 3, 4, 4, 6)			(4.70)			
3.00 3.00-3.50 3.50	CPT B10 D11	N = 30 (13, 5, 5, 8, 9, 8)					3.00m; becoming dense.	
4.00 4.00-4.50 4.50-5.00 4.50	CPT B13 C D14	N = 31 (5, 4, 7, 6, 9, 9)						
5.00 5.00-6.60 5.00-5.50 5.50	CPT C B16 D17	N = 45 (6, 6, 7, 9, 10, 19)	83.72		5.20		Dense brown sandy very silty subangular to rounded fine to coarse assorted grey limestone GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone.	
			82.92		(0.80) 6.00			
Borehole continued as a Cored Drillhole								

IDL AGS3 UK BH WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water (bgl) Depth, m	From	To	Hours	From	To	
27-01-22	16.00	6.10	6.00	203		2.6 5.6 6	2.9 5.8 6.1	1 1 1			Falling head test expedited in BH. 50mm standpipe installed. Response zone 8.50m to 12.00m.

All dimensions in metres Scale 1:50	Client: Irish Water	Method/ Plant Used Dando 2000/DB520	Bit Design	Driller BT/IP	Logged By EAT
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DRILLHOLE LOG

Project WSP Lot 2 - Booster Pumping Station				Location Lot 2, County Offaly		DRILLHOLE No BPS-DS001	
Job No 2021OY102		Date 16-02-22 16-02-22		Ground Level (m OD) 85.52			
Engineer Mott MacDonald						Sheet 1 of 2 Rev. FINAL	

RUN DETAILS						STRATA			Geology	Instrument/ Backfill
Depth Date	TCR (SCR) RQD	(SPT) Fracture Spacing	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION				
						Discontinuities	Detail	Main		
0.00	0 (-)	NA			(1.50)	0.00 - 8.00 m: overburden			Open hole drilling. No recovery.	
1.50			84.02		1.50					
2.00	40 (-)	2.00 (14)			(2.00)	Very stiff light brown slightly sandy gravelly SILT with low cobble content. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of assorted grey limestone. Cobbles are subrounded to angular of limestone. 2.00m: becoming firm.				
3.50	33 (-)		82.02		3.50					
5.00	27 (-)	3.50 (17)				Medium dense greyish brown subangular to subrounded fine to coarse brown sandstone and assorted grey limestone GRAVEL with medium cobble content. Cobbles are of light grey limestone.				
6.50	13 (-)	5.00 (38)			(4.50)	5.00m; becoming dense.				
8.00	20 (-)	6.50(50/30mm)			8.00	6.50m: becoming very dense.				
6.02			77.52							

IDL AGS UK DH (SPTS) WSP OFFALY LOT2 S&A ALL FILE MARCH 21 2022.GPJ IDL TP TEMPLATE.GDT 10/8/22

Drilling Progress and Water Observations								Rotary Flush				GENERAL REMARKS
Date	Time	Depth	Depth	Casing Dia	Core Dia mm	Strike	Water Standing	From (m)	To (m)	Type	Return (%)	
16-02-22	14.00	8.00	1.50					0	8.00	water	100	BH backfilled.

All dimensions in metres Scale 1:50		Client: Irish Water		Method/ Plant Used Hydreq			Bit Design	Driller IP	Logged By EAT	
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Appendix 7B

Part 1 Dynamic Sampling Records



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DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDPTP002
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 86.19	Co-Ordinates () E 615,240.8 N 707,113.1		
Engineer Mott MacDonald				Sheet 1 of 1 Rev. FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	1 2 3								
2	2 3 3 4								
3	4 5 4 6 5								
4	6 8 7 3 3								
5	3 3 2 3 2								
6	4 8 5 7 7								
7	6 5 6 9 8								
8	10 16 11 17 25								Refusal. 25 blows for 50mm.
9									

AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022 GPJ AGS 3.1.GDT 10/8/22

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 3.90m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type		
Damper		

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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Irish drilling LTD

DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDPTP006
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 86.69	Co-Ordinates () E 615,303.6 N 707,105.1		
Engineer Mott MacDonald				Sheet 1 of 1 Rev. FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	2								
2	3								
3	4								
4	5								
5	6								
6	7								
7	8								
8	9								
9	10								
10	11								
11	12								
12	13								
13	14								
14	15								
15	16								
16	17								
17	18								
18	19								
19	20								
20	21								
21	22								
22	23								
23	24								
24	25								
25	26								
26	27								
27	28								
28	29								
29	30								
30	31								
31	32								
32	33								
33	34								
34	35								
35	36								
36	37								
37	38								
38	39								
39	40								
40	41								
41	42								
42	43								
43	44								
44	45								
45	46								
46	47								
47	48								
48	49								
49	50								

Refusal. 25 blows for 0mm.

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 2.70m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type		
Damper		

AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022 GPJ AGS 3 1.GDT 10/8/22

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDPTP014
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 86.90	Co-Ordinates () E 615,355.6 N 707,144.4		Sheet 1 of 1 Rev. FINAL
Engineer Mott MacDonald					

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
	2								
	4								
1	5								
	4								
	4								
	5								
	6								
	8								
2	8								
	9								
	10								
	11								
	3								
	2								
	3								
	4								
3	4								
	5								
	5								
	6								
	7								
	8								
	7								
	8								
	10								
4	10								
	11								
	7								
	6								
	19								
	25								Refusal. 25 blows for 50mm.
5									
6									
7									
8									
9									

AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022 GPJ AGS 3 1.GDT 10/8/22

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 4.40m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type		
Damper		

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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Irish drilling LTD

DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDPTP015
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 87.63	Co-Ordinates () E 615,296.5 N 707,175.8		
Engineer Mott MacDonald				Sheet 1 of 1 Rev. FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1 2 2 3								
1	0 1 1 2								
6	6 6 7 7								
8	7 9 10 10								
10	11 10 11 9								
14	9 6 7 7								
16	8 9 9 10 10								
13	16 13 14 15 19								
25									Refusal. 25 blows for 50mm.

AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022 GPJ AGS 3 1.GDT 10/8/22

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 4.00m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type		
Damper		

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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Irish drilling LTD

DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDPTP026
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 89.81	Co-Ordinates () E 615,349.0 N 707,226.6		Sheet 1 of 1 Rev. FINAL
Engineer Mott MacDonald					

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	1								
1	1 2 3 4 5								
2	2 3 4 5								
3	2 2 3 2 1 3 2 2 6 8 8 9 10 20 25 24 20 8 8 7 9 25 25								Refusal. 25 blows for 50mm.
4									
5									
6									
7									
8									
9									

AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022 GPJ AGS 3 1.GDT 10/8/22

Hammer Wt (kg)		GENERAL REMARKS DP terminated at 3.90m bgl.
Hammer Drop (mm)		
Cone Dia (mm)		
Cone Type		
Damper		

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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Irish drilling LTD

DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDS001
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 85.52	Co-Ordinates () E 615,229.3 N 707,099.8		
Engineer Mott MacDonald				Sheet 1 of 1 Rev. FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	4								
	5								
	7								
	8								
6	5								
	5								
	4								
3	3								
	3								
	2								
	4								
10	6								
	3								
	3								
	2								
2	2								
	2								
	1								
	1								
	2								
1	3								
	8								
	6								
3	5								
	4								
	3								
	5								
2	5								
	5								
	4								
4	6								
	6								
	7								
	6								
	8								
	10								
	16								
	18								
5	25								Refusal. 25 blows for 50mm.

AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022.GPJ AGS 3.1.GDT 10/8/22

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 5.00m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type		
Damper		

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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Irish drilling LTD

DYNAMIC PROBE LOG

Project WSP Lot 2 - Booster Pumping Station			Location Lot 2, County Offaly		PROBE No BPSDS002
Job No 2021OY102	Date 07-02-22 07-02-22	Ground Level (m OD) 86.32	Co-Ordinates () E 615,335.8 N 707,078.9		
Engineer Mott MacDonald				Sheet 1 of 1 Rev. FINAL	

Depth (m)	Readings (blows/100mm)	Diagram (N100 Values)						Torque (Nm)	Remarks
		5	10	15	20	25	30		
0	2								
	3								
	3								
4	6								
	4								
	3								
1	2								
	3								
	8								
	7								
	7								
5	5								
	4								
	6								
2	11								
	7								
	7								
	9								
	7								
8	3								
	3								
	6								
3	13								
	17								
	25								Refusal. 25 blows for 0mm.
4									
5									
6									
7									
8									
9									

Hammer Wt (kg)	50	GENERAL REMARKS DP terminated at 3.20m bgl.
Hammer Drop (mm)	500	
Cone Dia (mm)	40	
Cone Type		
Damper		

All dimensions in metres Scale 1:62.5	Client: Irish Water	Method/ Plant Used DPH Rig	Bit Design	Driller BT	Logged By BT
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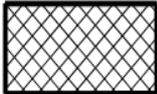
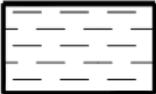
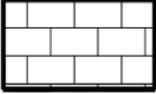
AGS3 DYNAMIC PROBE WSP DPS ALL FILE NEW MAR 1 2022 GPJ AGS 3 1.GDT 10/8/22



Appendix 7B

Part 2 Windowless Sampling Records

The following Key Legend Table details the symbology used in general on the engineering logs to describe ground conditions encountered:

Legend:	
	Made ground=mg
	Clay=cl
	Boulders and cobbles=b/c
	Gravel=g
	Peat=p
	Silty sand=s/si
	Sand=s
	Rock=r
	Silt=si

PROJECT: WSP Lot 2 - Booster Pumping Station
LOCATION: County Offaly
CLIENT: Irish Water
ENGINEER: Mott MacDonald
Co-ordinates: N 707,099.8 E 615,229.3
WS: BPS DS001
Sheet 1 of 1
Rig: DPH Rig
Ground level: 85.52m O.D.
DATE: 7.2.22

GROUNDWATER
 Water strikes:
 1st: dry
 2nd:
 3rd:
LOGGED BY: BT

Depth (m)	Date	Samples	Depth (m)	SPT (N)	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0		WS	0.00-1.00					Brown silty sandy subangular to rounded fine to coarse assorted grey limestone GRAV Sand is fine to coarse.	
1		WS	1.00-1.10			84.42	1.10	WS terminated at 1.10m bgl - refusal.	
2					END				
3									
4									
5									
6									
7									
8									
9									
10									

Remarks: WS terminated at 1.10m bgl.
Scale: 1:50

WINDOWLESS SAMPLER WINDOW SAMPLES.GPJ IRISHDRLL.GDT 10/8/22

PROJECT: WSP Lot 2 - Booster Pumping Station
LOCATION: County Offaly
CLIENT: Irish Water
ENGINEER: Mott MacDonald

WS: BPS DS002
Sheet 1 of 1
Co-ordinates: N 707,078.9 E 615,335.8
Rig: DPH Rig
DATE: 7.2.22

Ground level: 86.32m O.D.
GROUNDWATER
 Water strikes:
 1st: dry
 2nd:
 3rd:

LOGGED BY: BT

Depth (m)	Date	Samples	Depth (m)	SPT (N)	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	Instrument/ Backfill
0		WS	0.00-1.00					Brown silty very sandy subangular to rounded fine to coarse assorted grey limestone GRAVEL. Sand is fine to medium.	
1		WS	1.00-1.80			84.52	1.80		
2					END			WS terminated at 1.80m bgl - refusal.	
3									
4									
5									
6									
7									
8									
9									
10									

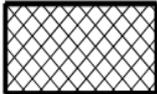
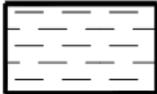
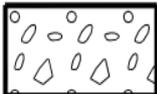
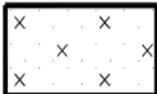
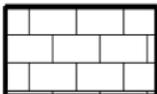
Remarks: WS terminated at 1.80m bgl.

Scale:
1:50



Appendix 7C Trial Pit Records

The following Key Legend Table details the symbology used in general on the engineering logs to describe ground conditions encountered:

Legend:	
	Made ground=mg
	Clay=cl
	Boulders and cobbles=b/c
	Gravel=g
	Peat=p
	Silty sand=s/si
	Sand=s
	Rock=r
	Silt=si

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP001
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,227.1 N 707,121.2	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.17m O.D.		DATE: 25.11.21

GROUNDWATER	PIT DIRECTION: 300-120		Shoring/Support: N/A Stability: Pit stable.
Water strikes: Rose to after:	PIT DIMENSION: 0.50 * 4.00m		
1st: dry	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 1	0.40-0.70			85.77	0.40	
			D 2	0.70					Greyish brown silty fine to coarse SAND and GRAVEL with low cobble content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 3	0.90-1.20			85.27	0.90	
1			D 4	1.20					Greyish brown silty very sandy GRAVEL with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.
							84.67	1.50	
			B 5	2.00-2.30					Light greyish brown silty very sandy GRAVEL with medium cobble content and medium boulder content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			D 6	2.30					
							83.37	2.80	
2			B 7	3.00-3.30				Stiff light greyish brown slightly sandy slightly gravelly SILT with medium cobble content and medium boulder content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 500mm in length.	
			D 8	3.30			82.87	3.30	
						END			TP terminated at 3.30m bgl. Obstruction as boulders and stiff strata.

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP002
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,240.8 N 707,113.1	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.19m O.D.		DATE: 25.11.21

GROUNDWATER
 Water strikes: 1st: dry 2nd: 3rd:
 Rose to after:
PIT DIRECTION: 350-170
PIT DIMENSION: 1.00 * 4.00m
LOGGED BY: PC

Shoring/Support: N/A
 Stability: Pit unstable. Sidewall collapse from 0.40m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown gravelly silty CLAY with low cobble content and some rootlets. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are rounded of limestone.
			B 1	0.40-0.70			85.79	0.40	Bluish grey mottled brown silty sandy subangular to rounded fine to coarse limestone GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone.
			D 2	0.70			85.39	0.80	
1									Damp greyish brown very silty very sandy GRAVEL with medium cobble content and low boulder content. Sand is fine. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 300mm in length.
			B 3	1.50-1.80					
			D 4	1.80					
2									Damp greyish brown silty very sandy GRAVEL with medium cobble content and medium boulder content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 500mm in length.
			B 5	2.80-3.10					
			D 6	3.10			82.89	3.30	
						END			TP terminated at 3.30m bgl. Obstruction as boulders.

Remarks: TP dry on excavation. TP backfilled with arisings. **Scale:**
1:25

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP003
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,259.9 N 707,097.5	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.21m O.D.		DATE: 24.11.21

GROUNDWATER	PIT DIRECTION: 320-140		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 0.30m bgl.
Water strikes: 1st: dry	PIT DIMENSION: 0.50 * 4.00m		
2nd: dry	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY with low cobble content. Gravel is subrounded to rounded fine to coarse of limestone and sandstone. Cobbles are subrounded to rounded of limestone and sandstone.
			B 1	0.30-0.60			85.91	0.30	Mottled light greyish brown silty very sandy GRAVEL with medium cobble content. Gravel is subrounded to rounded fine to coarse of limestone and sandstone. Sand is fine. Cobbles are subrounded to rounded of limestone and sandstone.
			D 2	0.60					
1							85.21	1.00	Light brown slightly gravelly fine to medium SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 3	1.20-1.50					
			D 4	1.50					
2							84.31	1.90	Damp light greyish brown very sandy very silty GRAVEL with medium cobble content and low boulder content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			B 5	2.40-2.70					
			D 6	2.70			83.51	2.70	TP terminated at 2.70m bgl. Unable to progress TP - sidewall collapse.
3						END			
4									
5									

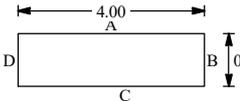
Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP004
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,301.2 N 707,089.5	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.49m O.D.		DATE: 23.11.21

GROUNDWATER
 Water strikes: Rose to after:
 1st: dry
 2nd:
 3rd:

PIT DIRECTION: 280-100
PIT DIMENSION: 0.50 * 4.00m
LOGGED BY: PC



Shoring/Support: N/A
 Stability: Pit unstable. Sidewall collapse from 0.60m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over brown slightly gravelly very silty SAND. Gravel is subangular to subrounded fine to coarse of limestone.
			B 1	0.30-0.60			86.19	0.30	
			ANE	0.50	19mm vane				
			D 2	0.50	17 kN/m ²		85.89	0.60	Orangish brown very gravelly very silty fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of limestone.
			B 3	0.60-0.90	14 kN/m ²				
			D 4	0.80			85.59	0.90	Brownish grey silty sandy subangular to rounded fine to coarse limestone GRAVEL with medium cobble content and low boulder content. Sand is fine. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 250mm in length.
1									Bluish grey silty sandy subrounded to rounded fine to coarse limestone GRAVEL with high cobble content and medium boulder content. Sand is coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 350mm in length.
			B 5	1.50-1.80					
2							83.99	2.50	
						END			TP terminated at 2.50m bgl. Unable to progress TP - sidewall collapse.
3									
4									
5									

Remarks: TP dry on excavation. TP backfilled with arisings.

Scale: 1:25

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP006
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,303.6 N 707,105.1	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.69m O.D.		DATE: 23.11.21

GROUNDWATER	PIT DIRECTION: 280-100		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 0.60m bgl.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 0.50 * 4.00m		
Rose to after:	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse of limestone.
			B 1	0.30-0.60			86.39	0.30	Orangish brown gravelly very silty SAND. Sand is fine. Gravel is subrounded to rounded fine to coarse of limestone.
			ANE	0.50	19mm vane		86.09	0.60	
			D 2	0.50	17 kN/m ²				0.50m: orange brown slightly sandy gravelly SILT.
			B 3	0.60-0.90	14 kN/m ²				Light brown gravelly silty fine to medium SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			D 4	0.90			85.49	1.20	
1									Light greyish brown fine to medium SAND.
			B 5	1.50-1.80					
			D 6	1.80			84.49	2.20	Brownish grey silty very gravelly fine to medium SAND with low cobble content and low boulder content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			B 7	2.70-3.00			83.69	3.00	
3			D 8	3.00		END			TP terminated at 3.00m bgl. Unable to progress TP - sidewall collapse.
4									
5									

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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PROJECT: WSP Lot 2 - Booster Pumping Station
LOCATION: County Offaly
CLIENT: Irish Water
ENGINEER: Mott MacDonald
Co-ordinates: E 615,279.3 N 707,123.2
TRIALPIT: BPS-TP007
Sheet 1 of 1
Rig: Hitachi Zaxis 130 LCN
Rev: FINAL
Ground level: 86.28m O.D.
DATE: 24.11.21

GROUNDWATER
 Water strikes: 1st: dry 2nd: 3rd:
 Rose to after:
PIT DIRECTION: 290-110
PIT DIMENSION: 0.50 * 4.00m
LOGGED BY: PC
 Shoring/Support: N/A
 Stability: Pit unstable. Sidewall collapse from 0.30m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown gravelly silty CLAY with low cobble content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 1	0.30-0.60			85.98	0.30	Bluish grey mottled brown silty very sandy subrounded to rounded fine to coarse limestone GRAVEL with high cobble content and low boulder content. Sand is medium to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			D 2	0.60					
			B 3	1.50-1.80					
			D 4	1.80			84.38	1.90	Soft damp light greyish brown slightly gravelly sandy SILT with medium cobble content and medium boulder content. Sand is fine. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 450mm in length.
			B 5	2.50-2.80					
			D 6	2.80			83.48	2.80	TP terminated at 2.80m bgl. Unable to progress TP - sidewall collapse.
3						END			
4									
5									

Remarks: TP dry on excavation. TP backfilled with arisings.
Scale: 1:25

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP008
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,266.0 N 707,140.3	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.34m O.D.		DATE: 25.11.21

GROUNDWATER	PIT DIRECTION: 120-300		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 0.40m bgl.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 0.50 * 4.00m		
Rose to after:	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse of limestone.
			B 1 ANE	0.40-0.70	19mm vane 17 kN/m ² 18 kN/m ²		85.94	0.40	Orangish brown very silty SAND and GRAVEL with low cobble content and low boulder content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 300mm in length.
			D 2	0.70			85.34	1.00	
1			B 3 D 4	1.50-1.80 1.80					
2							83.94	2.40	Light brown very silty very sandy GRAVEL with medium cobble content and medium boulder content. Sand is fine. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 500mm in length.
3			B 5 D 6	3.00-3.30 3.30			83.04	3.30	TP terminated at 3.30m bgl. Unable to progress TP - sidewall collapse.
4						END			
5									

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP009
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,257.0 N 707,163.8	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 87.11m O.D.		DATE: 25.11.21

GROUNDWATER	PIT DIRECTION: 020-200		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 2.00m bgl.
Water strikes: 1st: dry	PIT DIMENSION: 1.00 * 4.00m		
2nd: dry	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown silty CLAY with some rootlets.
			B 1 ANE	0.40-0.70	19mm vane 8 kN/m ² 9 kN/m ²		86.71	0.40	Soft light brown slightly gravelly sandy SILT. Gravel is subangular to rounded fine to coarse.
			D 2	0.70			86.31	0.80	
1			B 3	1.20-1.50			85.11	2.00	Light brown silty very sandy GRAVEL with medium cobble content and low boulder content. Sand is fine. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			D 4	1.50					
2			B 5	2.50-2.80					Light brown very silty very sandy subangular to rounded fine to coarse limestone GRAVEL with high cobble content and medium boulder content. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 800mm in length.
3						END	83.91	3.20	TP terminated at 3.20m bgl. Obstruction as boulders.
4									
5									

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
--	-----------------------

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP010
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,283.1 N 707,144.5	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.35m O.D.		DATE: 24.11.21

GROUNDWATER	PIT DIRECTION: 120-300		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 0.40m bgl.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 0.50 * 4.00m		
Rose to after:	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 1 ANE D 2	0.40-0.70 0.50 0.70	19mm vane 15 kN/m ² 17 kN/m ² 16 kN/m ²		85.95	0.40	Firm brown slightly gravelly sandy SILT with medium cobble content and low boulder content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 500mm in length.
1							85.15	1.20	Soft damp greyish brown slightly gravelly sandy SILT with medium cobble content and medium boulder content. Sand is fine to medium. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 500mm in length.
2			B 3 D 4	1.70-2.00 2.00			83.85	2.50	TP terminated at 2.50m bgl. Unable to progress TP - sidewall collapse.
3						END			
4									
5									

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
--	-----------------------

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP011
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,305.5 N 707,130.4	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.29m O.D.		DATE: 24.11.21

GROUNDWATER	PIT DIRECTION: 130-310		Shoring/Support: N/A Stability: Pit stable.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 1.00 * 4.00m		
Rose to after:	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	
0									Grass over firm brown slightly gravelly silty CLAY with low cobble content and low boulder content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 250mm in length.	
			B 1	0.40-0.70			85.89	0.40	Damp greyish orangish brown silty very sandy GRAVEL with medium cobble content and medium boulder content. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.	
			D 2	0.70			85.39	0.90	Damp light greyish brown silty very sandy GRAVEL with medium cobble content and medium boulder content. Gravel is subrounded to rounded fine to coarse of limestone. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.	
1			B 3	1.30-1.60						
			D 4	1.60						
2			B 5	2.30-2.60						
			D 6	2.60			83.59	2.70		Light brownish grey very sandy very silty GRAVEL with medium cobble content and medium boulder content. Gravel is subangular to rounded fine to coarse of limestone. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 500mm in length.
3			B 7	3.30-3.60						
			D 8	3.60			82.69	3.60		TP terminated at 3.60m bgl. Obstruction as boulders.
4						END				
5										

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP012
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,328.2 N 707,114.5	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 86.86m O.D.		DATE: 23.11.21

GROUNDWATER	PIT DIRECTION: 280-100		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 0.50m bgl.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 0.50 * 4.00m		
Rose to after:	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	
0										
			B 1	0.20-0.50			86.66	0.20	Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of limestone.	
			ANE	0.40	19mm vane 15 kN/m ² 16 kN/m ²		86.36	0.50	Firm orangish brown slightly gravelly silty CLAY. Gravel is subrounded to rounded fine to coarse of limestone.	
			D 2	0.40						Damp greyish brown silty very sandy GRAVEL with medium cobble content and low boulder content. Gravel is subrounded to rounded fine to coarse of limestone. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 300mm in length.
			B 3	1.20-1.50						
			D 4	1.50						
								84.36	2.50	
			B 5	2.60-2.90						Firm light greyish brown slightly gravelly sandy SILT. Sand is fine.
			D 6	2.90				83.66	3.20	
			B 7	4.00-4.30					Brownish grey silty very gravelly medium to coarse SAND with low cobble content. Gravel is subangular to rounded fine to medium of limestone. Cobbles are subrounded to rounded of limestone.	
			D 8	4.30			82.36	4.50		
						END			TP terminated at 4.50m bgl.	

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022 GP.J IRISHDR.L.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP015
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,296.5 N 707,175.8	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 87.63m O.D.		DATE: 25.11.21

GROUNDWATER	PIT DIRECTION: 020-200		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 3.70m bgl.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 1.00 * 4.00m		
Rose to after:	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown silty CLAY with some rootlets.
			B 1	0.30-0.60			87.33	0.30	Damp orangish brown very silty very sandy GRAVEL with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Sand is medium to coarse. Cobbles are subrounded to rounded of limestone.
			ANE	0.50	19mm vane				
			D 2	0.60	12 kN/m ² 16 kN/m ² 14 kN/m ²		86.93	0.70	Brown mottled grey slightly silty gravelly coarse SAND. Gravel is angular to subangular fine to coarse of limestone.
1			B 3	1.00-1.30			86.13	1.50	
2			B 4	2.00-2.30					Brown mottled grey slightly gravelly silty fine to medium SAND. Gravel is angular to subangular fine to coarse of limestone.
							84.73	2.90	
3			B 5	3.00-3.30					Light greyish brown slightly gravelly silty fine to medium SAND. Gravel is angular to subangular fine to coarse of limestone.
			D 6	3.30			83.93	3.70	
4			B 7	3.70-4.00			83.63	4.00	Grey silty very gravelly medium to coarse SAND with medium cobble content and low boulder content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are up to 300mm in length.
4						END			TP terminated at 4.00m bgl. Unable to progress TP - sidewall collapse.

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP016
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,292.9 N 707,199.6	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 88.63m O.D.		DATE: 25.11.21

GROUNDWATER
 Water strikes: 1st: dry 2nd: 3rd:
 Rose to after:
PIT DIRECTION: 300-120
PIT DIMENSION: 1.00 * 4.00m
LOGGED BY: PC

Shoring/Support: N/A
 Stability: Pit unstable. Sidewall collapse from 1.70m to 2.80m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of limestone.
			B 1 ANE D 2	0.40-0.70 0.50 0.50	19mm vane 9 kN/m ² 10 kN/m ²		88.23	0.40	Soft damp orangish brown slightly gravelly sandy SILT with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 3 D 4	1.20-1.50 1.50			87.93	0.70	Light brown very sandy very silty GRAVEL with medium cobble content and low boulder content. Sand is fine. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 300mm in length.
			B 5 D 6	2.20-2.50 2.50			86.93	1.70	Light bluish grey mottled brown silty very sandy GRAVEL with medium cobble content and low boulder content. Sand is fine to medium. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 300mm in length.
			B 7 D 8	3.80-4.10 4.10			85.83	2.80	Light brown sandy very silty GRAVEL with medium cobble content and medium boulder content. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subangular to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 450mm in length.
						END	84.53	4.10	TP terminated at 4.10m bgl. Obstruction as stiff strata and boulders.

Remarks: TP dry on excavation. TP backfilled with arisings. **Scale: 1:25**

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022 GP.J IRISHDR.L.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP017
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,319.4 N 707,182.4	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 87.71m O.D.		DATE: 25.11.21

GROUNDWATER
 Water strikes: 1st: dry 2nd: 3rd:
 Rose to after:
PIT DIRECTION: 280-100
PIT DIMENSION: 1.00 * 4.00m
LOGGED BY: PC

Shoring/Support: N/A
 Stability: Pit stable.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to rounded fine to coarse of limestone.
			B 1 D 2	0.30-0.60 0.50 0.50	19mm vane 12 kN/m ² 11 kN/m ²		87.41	0.30	Orangish brown silty very gravelly medium SAND with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subangular to rounded of limestone.
			B 3 D 4	0.80-1.10 1.10					Light brown very sandy very silty GRAVEL with high cobble content and low boulder content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subangular to rounded of limestone. Boulders are subangular to rounded of limestone. Boulders are up to 300mm in length.
							86.51	1.20	Brown mottled grey very silty very sandy subrounded to rounded fine to coarse limestone GRAVEL with high cobble content and medium boulder content. Sand is fine to coarse. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			B 5 D 6	2.30-2.60 2.60			84.91	2.80	Stiff light brown slightly gravelly sandy SILT with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subangular to rounded of limestone. Boulders are up to 400mm in length.
			B 7 D 8	3.50-3.80 3.80			83.61	4.10	TP terminated at 4.10m bgl. Obstruction as stiff strata and boulders.
						END			

Remarks: TP dry on excavation. TP backfilled with arisings. **Scale: 1:25**

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP018
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,325.0 N 707,203.5	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 88.84m O.D.		DATE: 26.11.21

GROUNDWATER	PIT DIRECTION: 020-200		Shoring/Support: N/A Stability: Pit stable.
Water strikes: Rose to after:	PIT DIMENSION: 1.00 * 4.00m		
1st: dry	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of limestone.
			B 1	0.30-0.60			88.54	0.30	
			ANE	0.50	19mm vane 10 kN/m ²				Soft orangish brown slightly gravelly sandy SILT with low cobble content. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subangular to rounded of limestone.
			D 2	0.60	7 kN/m ²		88.24	0.60	
			B 3	0.70-1.00					Damp light brown sandy very silty GRAVEL with medium cobble content and medium boulder content. Sand is fine. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subangular to rounded of limestone. Boulders are up to 700mm in length.
1			D 4	1.00					
			B 5	2.40-2.70					
			D 6	2.70			86.04	2.80	
3			B 7	3.50-3.80					Stiff light brown slightly sandy gravelly SILT with medium cobble content and medium boulder content. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subangular to rounded of limestone. Boulders are up to 500mm in length.
			D 8	3.80			85.04	3.80	
4						END			TP terminated at 3.80m bgl. Obstruction as stiff strata and boulders.
5									

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP019
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,344.1 N 707,210.0	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 89.10m O.D.		DATE: 26.11.21

GROUNDWATER	PIT DIRECTION: 020-200		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse from 1.90m bgl.
Water strikes: Rose to after:	PIT DIMENSION: 1.00 * 4.00m		
1st: dry	LOGGED BY: PC		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	
0									Grass over firm brown slightly gravelly silty CLAY with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded of limestone.	
			B 1	0.30-0.60			88.80	0.30	Firm orangish brown slightly gravelly sandy SILT with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.	
			ANE	0.50	19mm vane					
			D 2	0.60	15 kN/m ²			88.30	0.80	Firm greyish brown sandy very gravelly SILT with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are up to 400mm in length.
			B 3	1.30-1.60	12 kN/m ²					
			D 4	1.60				87.20	1.90	Damp greyish brown sandy very silty GRAVEL with medium boulder content. Gravel is subrounded to rounded fine to coarse of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 4050mm in length.
			B 5	2.20-2.50				86.60	2.50	
			D 6	2.50		END			TP terminated at 2.50m bgl. Unable to progress TP - sidewall collapse.	
3										
4										
5										

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP025
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,370.5 N 707,216.2	Rig: Hitachi 130
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 89.33m O.D.		DATE: 28.1.22

GROUNDWATER	PIT DIRECTION: 000-180		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse.
Water strikes: Rose to after:	PIT DIMENSION: 1.00 * 3.00m		
1st: dry 2nd: 3rd:	LOGGED BY: DOR		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0						x x x x	88.83	0.50	Soft dark brown gravelly SILT.
1			B 1 D 2	1.00-1.50 1.00-1.50		x x x x o o o o			Stiff grey slightly gravelly sandy SILT with medium cobble content and low boulder content. Cobbles are subangular to subrounded of siltstone. Boulders are subangular to subrounded of siltstone.
2			B 3 D 4	2.50-3.00 2.50-3.00		x x x x o o o o	87.23	2.10	Damp grey brown very sandy very silty medium GRAVEL with medium cobble content and low boulder content. Cobbles are subangular to subrounded of siltstone. Boulders are subangular to subrounded of siltstone.
3						x x x x o o o o	85.73	3.60	
4						END			TP terminated at 3.60m bgl. Unable to progress TP - sidewall collapse.
5									

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022 GP.J IRISHDR.L.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP026
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,349.0 N 707,226.6	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 89.81m O.D.		DATE: 26.11.21

GROUNDWATER	PIT DIRECTION: 020-200	
Water strikes: Rose to after:	PIT DIMENSION: 1.00 * 4.00m	
1st: dry	LOGGED BY: PC	

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION	
0									Grass over firm brown slightly gravelly silty CLAY with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.	
			B 1	0.30-0.60			89.51	0.30	Damp orangish brown gravelly very silty medium SAND with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.	
			ANE	0.50	19mm vane					
			D 2	0.60	9 kN/m ²			89.11	0.70	
					8 kN/m ²					Damp brownish grey sandy very silty coarse GRAVEL with medium cobble content and low boulder content. Sand is fine to coarse. Gravel is subrounded to rounded of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded of limestone. Boulders are up to 400mm in length.
			B 3	1.20-1.50						
			D 4	1.50						
			B 5	2.80-3.10						
			D 6	3.10			86.61	3.20		
						END			TP terminated at 3.20m bgl. Unable to progress TP - sidewall collapse.	

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP027
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,330.6 N 707,240.7	Rig: Hitachi Zaxis 130 LCN
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 90.63m O.D.		DATE: 26.11.21

GROUNDWATER
 Water strikes: Rose to after:
 1st: dry
 2nd:
 3rd:

PIT DIRECTION: 200-020
PIT DIMENSION: 1.00 * 4.00m
LOGGED BY: PC

Shoring/Support: N/A
 Stability: Pit stable.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse of limestone.
			B 1 ANE D 2	0.30-0.60 0.50 0.60	19mm vane 6 kN/m ² 9 kN/m ² 8 kN/m ²		90.33	0.30	Soft damp orangish brown very gravelly very silty SAND with low cobble content. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
1			B 3 D 4	1.30-1.60 1.60			89.83	0.80	Damp greyish brown sandy very silty GRAVEL with medium cobble content and low boulder content. Sand is fine. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 1000mm in length.
2			B 5 D 6	2.30-2.60 2.60			87.83	2.80	
3			B 7	3.30-3.60			87.03	3.60	Stiff light greyish brown slightly sandy slightly gravelly SILT with medium cobble content and medium boulder content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone. Boulders are subrounded to rounded of limestone. Boulders are up to 450mm in length.
4			D 8	3.60		END			TP terminated at 3.60m bgl. Obstruction as stiff strata and boulders.

Remarks: TP dry on excavation. TP backfilled with arisings.

Scale: 1:25

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station		TRIALPIT: BPS-TP028
LOCATION: County Offaly		Sheet 1 of 1
CLIENT: Irish Water	Co-ordinates: E 615,378.9 N 707,255.9	Rig: Hitachi 130
ENGINEER: Mott MacDonald		Rev: FINAL
Ground level: 91.21m O.D.		DATE: 28.1.22

GROUNDWATER	PIT DIRECTION: 000-180		Shoring/Support: N/A Stability: Pit unstable. Sidewall collapse.
Water strikes: 1st: dry 2nd: 3rd:	PIT DIMENSION: 1.00 * 3.00m		
Rose to after:	LOGGED BY: DOR		

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0						x x x x	90.81	0.40	Soft dark brown gravelly SILT.
1			B 1 D 2	0.70-1.20 0.70-1.20		x x x x o o o o			Firm grey brown slightly sandy gravelly SILT with medium cobble content. Sand is fine to coarse. Gravel is subangular to rounded fine to coarse of limestone. Cobbles are subangular to subrounded of siltstone.
2			B 3 D 4	2.00-2.50 2.00-2.50		x x x x o o o o	89.41	1.80	Brown grey very silty very sandy coarse GRAVEL with medium cobble content and low boulder content. Cobbles are subangular to subrounded of siltstone. Boulders are subangular to subrounded of siltstone.
3						x x x x o o o o			
4			B 5 D 6	3.50-4.00 3.50-4.00		x x x x o o o o			
4						x x x x o o o o	87.01	4.20	
						END			TP terminated at 4.20m bgl. Unable to progress TP - sidewall collapse.

Remarks: TP dry on excavation. TP backfilled with arisings.	Scale: 1:25
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TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

PROJECT: WSP Lot 2 - Booster Pumping Station
LOCATION: County Offaly
CLIENT: Irish Water
ENGINEER: Mott MacDonald
Co-ordinates: E 615,272.0 N 707,103.1
TRIALPIT: BPS-TPINF001
Sheet 1 of 1
Rig: Hitachi Zaxis 130 LCN
Rev: FINAL
Ground level: 86.38m O.D.
DATE: 24.11.21

GROUNDWATER
 Water strikes: 1st: dry 2nd: 3rd:
 Rose to after:
PIT DIRECTION: 320-140
PIT DIMENSION: 0.90 * 3.50m
LOGGED BY: PC
 Shoring/Support: N/A
 Stability: Pit unstable. Sidewall collapse from 0.30m bgl.

Depth (m)	Date	Water	Samples	Depth (m)	In-situ Vane Tests	LEGEND	Elevation m O.D.	Depth (m)	DESCRIPTION
0									Grass over firm brown slightly gravelly silty CLAY with low coble content and some rootlets. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
			B 1	0.30-0.60			86.08	0.30	
			D 2	0.50			85.78	0.60	Mottled light greyish brown silty very gravelly fine SAND with medium cobble content. Gravel is subrounded to rounded fine to coarse of limestone. Cobbles are subrounded to rounded of limestone.
									Light brown slightly silty fine to medium SAND.
			B 3	1.20-1.50					
			D 4	1.50			84.88	1.50	
						END			TP terminated at 1.50m bgl on REs instruction.

Remarks: Infiltration test expedited in TP. TP dry on excavation. TP backfilled with arisings.
Scale: 1:25

TRIAL PIT VANE & WL RISES WSP OFFALY LOT2 TPS ALL FILE MAR 25 2022.GPJ IRISHDRIL.GDT 10/6/22

Appendix 7D

Peat probe & Russian Core Records

N/A



Appendix 7E In-Situ Test Records

Part 1 Soil Infiltration Test Records

IRISH DRILLING LTD.
Loughrea Co. Galway



Tel: (091) 841274 info@irishdrilling.ie

Contract: WSP Lot 2 BPS SITE

Client: Irish Water

Engineer: Mott Macdonald

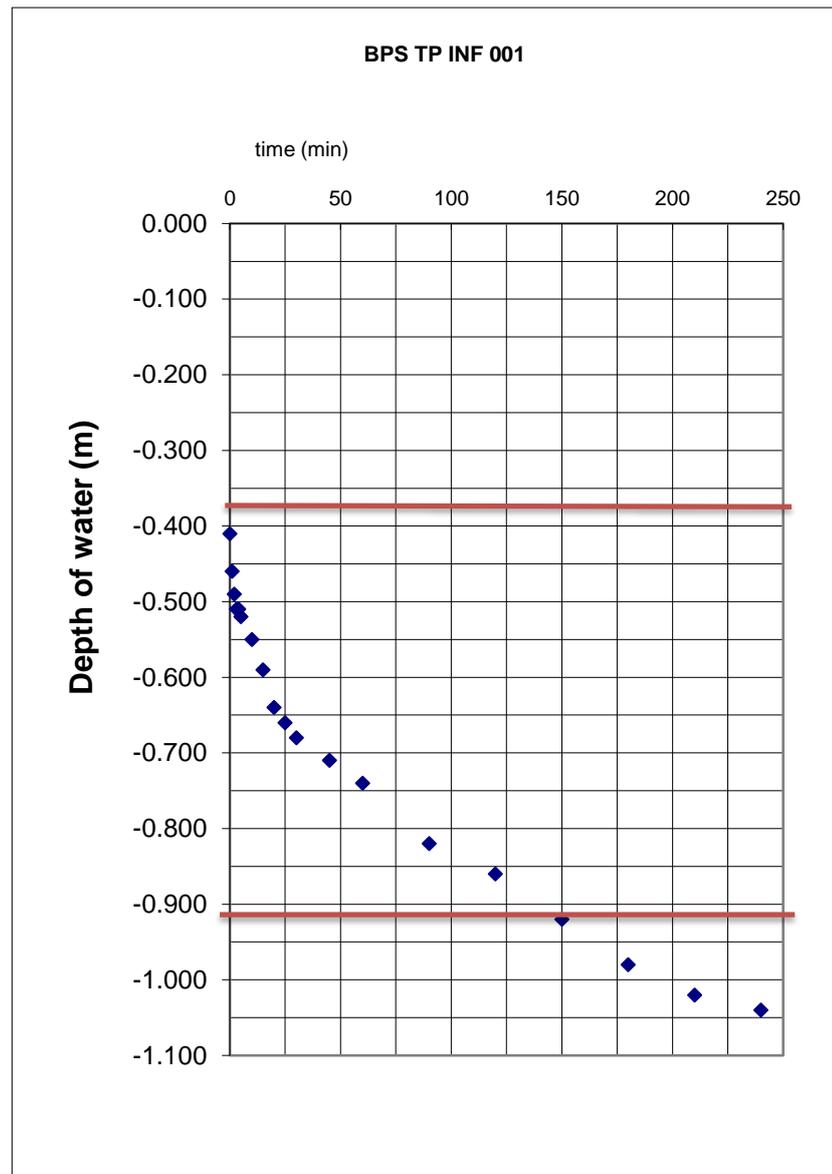
Date: 24/11/2021

Tested by: DK

INFILTRATION TEST - to BRE 365

BPS TP INF 001 Top of water level: 0.41 m
1st FILL Base of trial pit: 1.50 m
Dims. of trial pit: 3.5 x 0.9

time min	WL m
0	-0.410
1	-0.460
2	-0.490
3	-0.510
4	-0.510
5	-0.520
10	-0.550
15	-0.590
20	-0.640
25	-0.660
30	-0.680
45	-0.710
60	-0.740
90	-0.820
120	-0.860
150	-0.920
180	-0.980
210	-1.020
240	-1.040



Result:

Soil Infiltration Rate = 2.36×10^{-5} m/s
T75 interpolated.

Co-Ordinates:

Easting: 615272
Northing: 707103.1
R.L. 86.38mOD

IRISH DRILLING LTD.
Loughrea Co. Galway



Tel: (091) 841274 info@irishdrilling.ie

Contract: WSP Lot 2 BPS SITE

Client: Irish Water

Engineer: Mott Macdonald

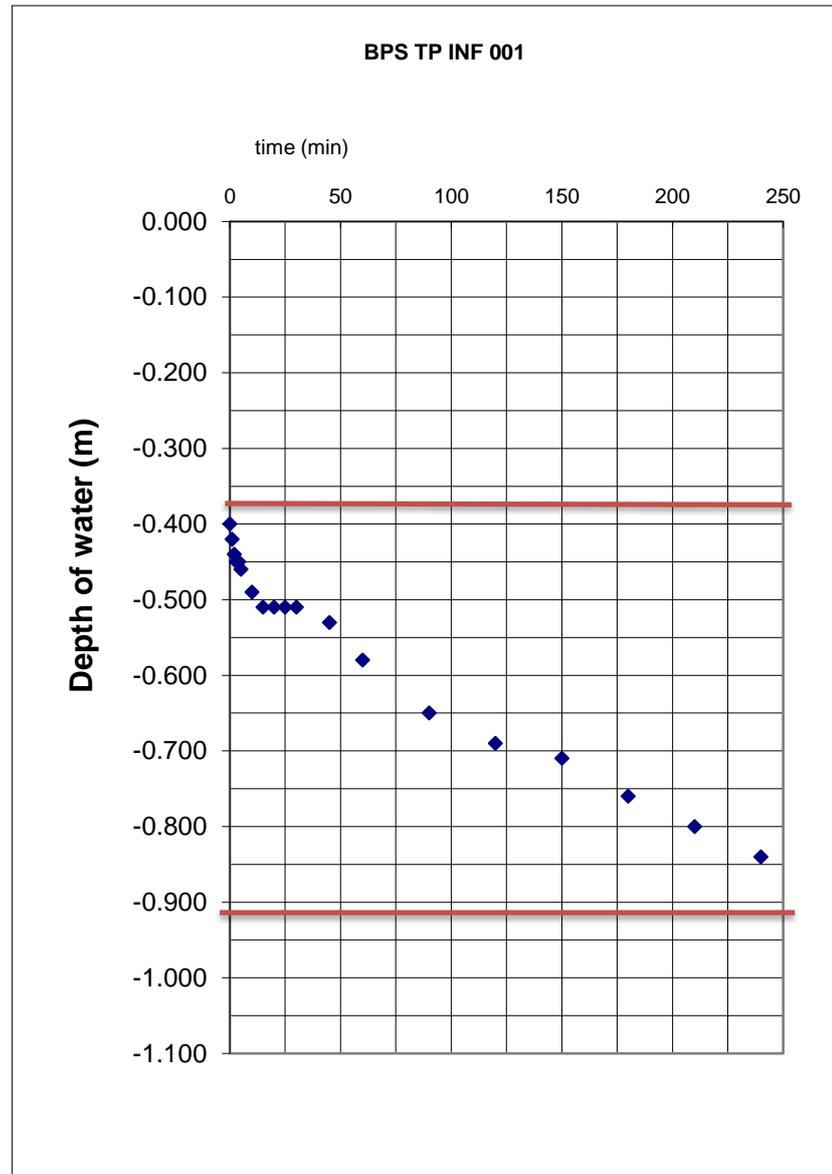
Date: 24/11/2021

Tested by: DK

INFILTRATION TEST - to BRE 365

BPS TP INF 001 Top of water level: 0.40 m
2nd FILL Base of trial pit: 1.50 m
Dims. of trial pit: 3.5 x 0.9

time min	WL m
0	-0.400
1	-0.420
2	-0.440
3	-0.450
4	-0.450
5	-0.460
10	-0.490
15	-0.510
20	-0.510
25	-0.510
30	-0.510
45	-0.530
60	-0.580
90	-0.650
120	-0.690
150	-0.710
180	-0.760
210	-0.800
240	-0.840



Result:

Soil Infiltration Rate = 2.50×10^{-5} m/s
T75 interpolated.

Co-Ordinates:

Easting: 615272
Northing: 707103.1
R.L. 86.38mOD

Appendix 7E In-Situ Test Records

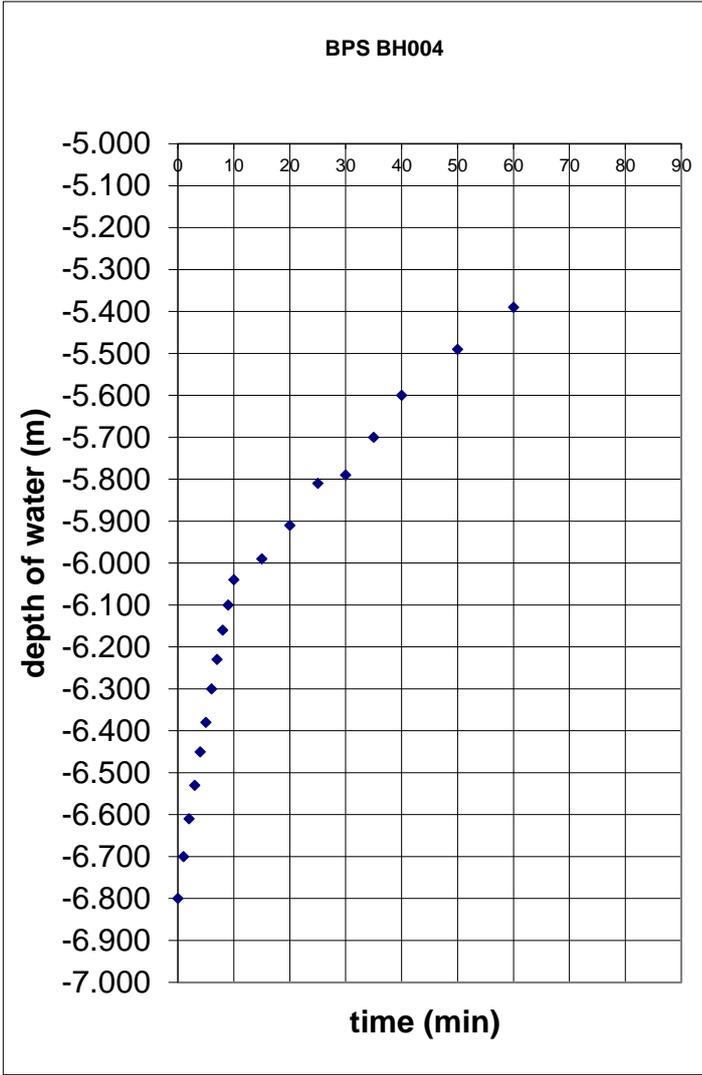
Part 2 Permeability Test Records

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 880 861	Contract: BPS SITE Client: Irish Water Engineer: Mott MacDonald Date: 31.01.2022 Tested by: BT
--	--

Rising Head Permeability Test

Bottom of Borehole (below ground level): 6.80m	Borehole No. BPS BH004
Bottom of Casing (below ground level): 5.50Mm	Ground Level (mOD): 86.97
Diameter of Borehole: 200mm	Co-ordinates:
Diameter of Standpipe: N/A	615344.2E
Response Zone: 5.50m -6.80m BGL	707103.1N
Initial ground water level: -6.80m	

time min	WL m
0	-6.800
1	-6.700
2	-6.610
3	-6.530
4	-6.450
5	-6.380
6	-6.300
7	-6.230
8	-6.160
9	-6.100
10	-6.040
15	-5.990
20	-5.910
25	-5.810
30	-5.790
35	-5.700
40	-5.600
50	-5.490
60	-5.390



Remarks:

Test carried out in borehole.
Water readings recorded from ground level.
Water pumped out of borehole before test commencement.

Response Zone Ground Conditions:

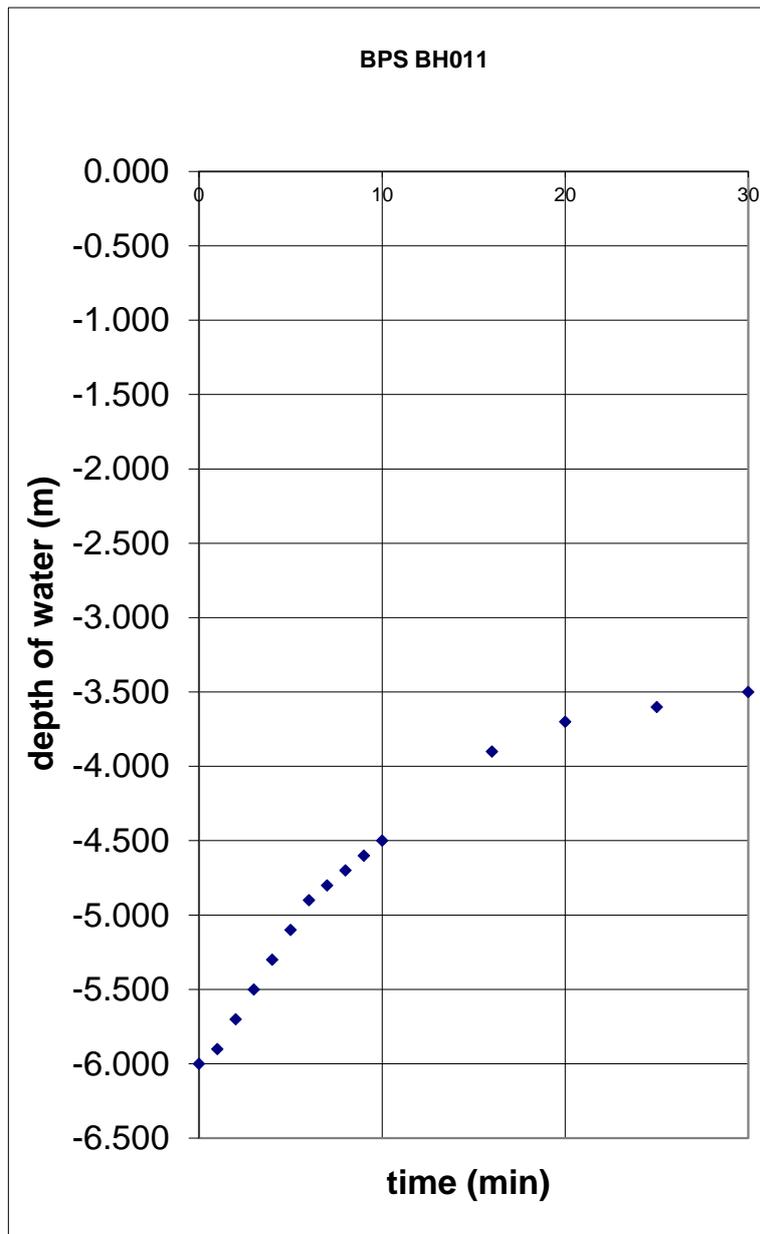
5.50-6.80m: Overburden (recovered as Brown GRAVEL with cobbles).

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 880 861	Contract: WSP Lot 1, Parteen Client: Irish Water Engineer: Mott MacDonald Date: 13/01/2022 Tested by: AG
--	--

Rising Head Permeability Test

Bottom of Borehole (below ground level): 4.00m	Borehole No. BPS BH011
Bottom of Casing (below ground level): N/A	Ground Level (mOD): 88.17
Diameter of Borehole: 96mm	Co-ordinates:
Diameter of Standpipe: 50mm	615340.3E
Response Zone: 2.50-6.50m BGL	707190.3N
Initial ground water level: -1.30m	

time min	WL m
0	-6.000
1	-5.900
2	-5.700
3	-5.500
4	-5.300
5	-5.100
6	-4.900
7	-4.800
8	-4.700
9	-4.600
10	-4.500
16	-3.900
20	-3.700
25	-3.600
30	-3.500
35	-3.400
40	-3.300
45	-3.200
50	-3.100
55	-2.900
60	-2.800



Remarks:

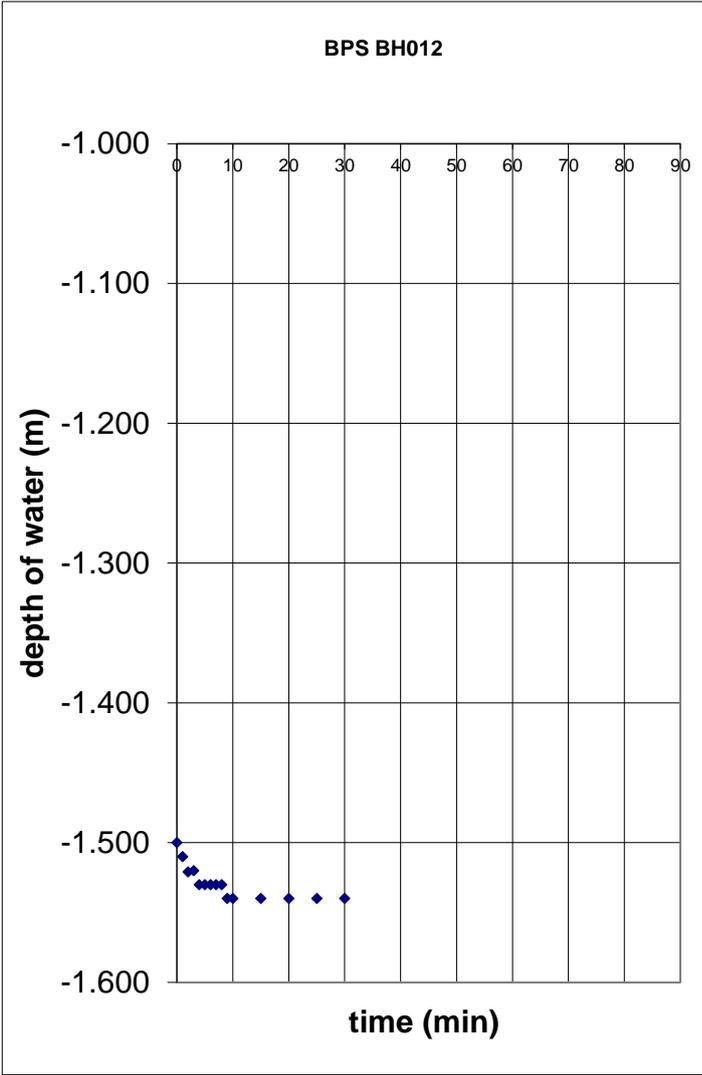
Borehole pumped out prior to commencing test.
 Test carried out in 50mm diameter standpipe.
 Water readings recorded from ground level.

IRISH DRILLING LTD. Loughrea Co. Galway Tel: (091) 841274 Fax: (091) 880 861	Contract: BPS SITE Client: Irish Water Engineer: Mott MacDonald Date: 27.01.2022 Tested by: BT
--	--

Falling Head Permeability Test

Bottom of Borehole (below ground level): 6.10m	Borehole No. BPS BH012
Bottom of Casing (below ground level): 4.00m	Ground Level (mOD): 88.92
Diameter of Borehole: 200mm	Co-ordinates:
Diameter of Standpipe: N/A	615367.9E
Response Zone: 4.00m -6.10m BGL	707200.5N
Initial ground water level: -1.50m	

time min	WL m
0	-1.500
1	-1.510
2	-1.521
3	-1.520
4	-1.530
5	-1.530
6	-1.530
7	-1.530
8	-1.530
9	-1.540
10	-1.540
15	-1.540
20	-1.540
25	-1.540
30	-1.540



Remarks:

Test carried out in borehole.
Water readings recorded from ground level.
Borehole filled with water to 1.50m bgl before test commencement.

Response Zone Ground Conditions:

4.00-5.20m: Overburden (recovered as brown slightly gravelly sandy silty CLAY with cobbles).
5.20-6.10m: Overburden (recovered as grey silty very sandy GRAVEL with cobbles).

Appendix 7E In-Situ Test Records

Part 3 Plate Bearing Test Records

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: WSP Eastern & Midlands Region, Lot 2

21OY102

Client: Irish Water

Engineer: Mott MacDonald

Date: 31/01/2022

Tested by: PC Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump D

Test Location Number:

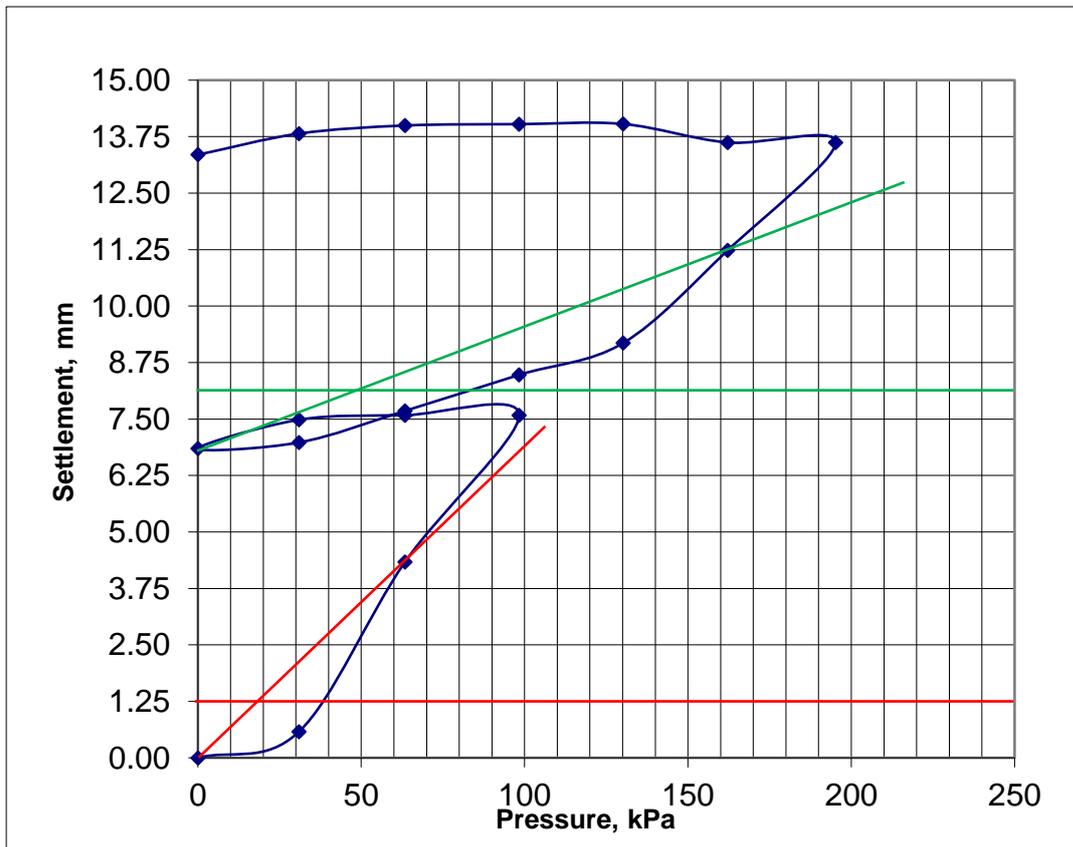
BPS TP010

Depth / Level:

0.6m

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
30.9	0.58
63.4	4.34
98.3	7.58
63.4	7.58
30.9	7.48
0	6.84
30.9	6.98
63.4	7.68
98.3	8.48
130.2	9.18
162.2	11.24
195.2	13.62
162.2	13.62
130.2	14.03
98.3	14.03
63.4	14.00
30.9	13.82
0	13.35



Pressures to give 1.25mm settlement

Cycle 1

1.25

(y) Settlement mm

Cycle 2

1.25

20

(p) Pressure kN/m²

50

16.00

Gradient (p/y)

40.00

0.829

Correction factor (to 762mm plate)

0.829

13.26

(k_s) Modulus of subgrade
reaction kPa/mm

33.16

0.9

Approximate CBR (%)
Approximation of CBR from HD 25/94
Design Manual for Roads and Bridges.

4.2

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: WSP Eastern & Midlands Region, Lot 2

21OY102

Client: Irish Water

Engineer: Mott MacDonald

Date: 31/01/2022

Tested by: PC

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump D

Test Location Number:
(Pump Station)

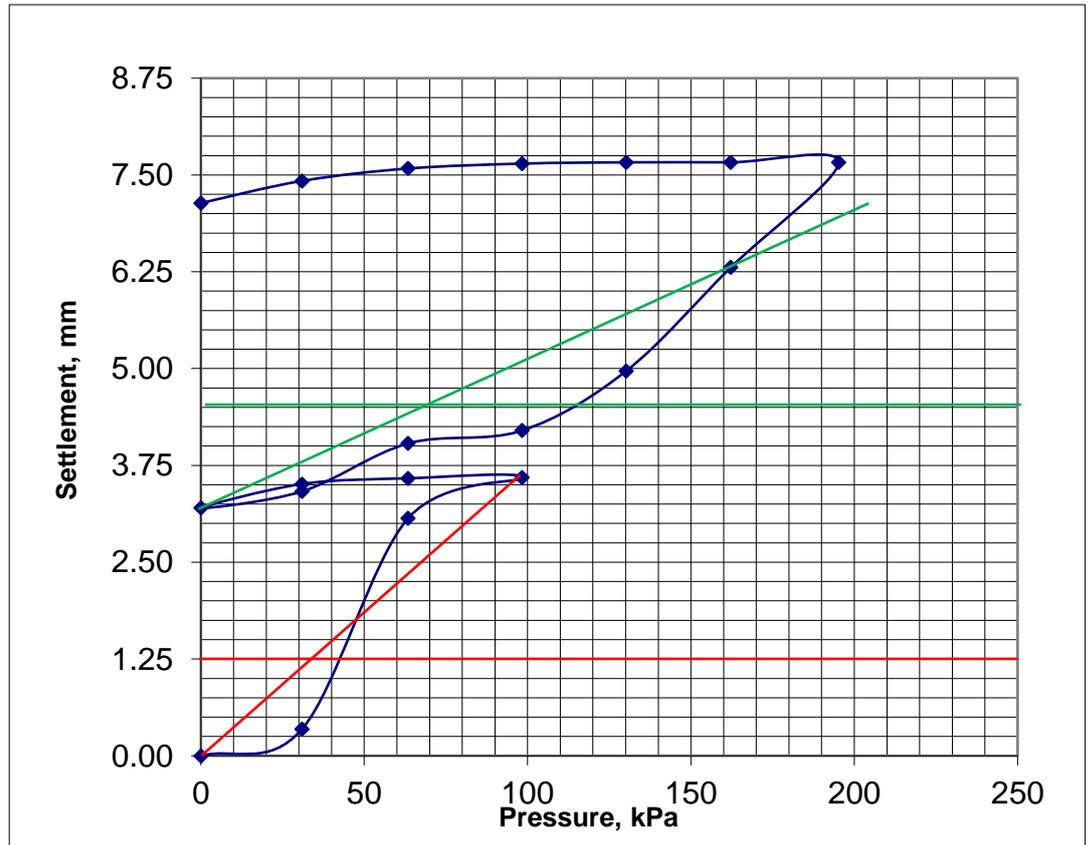
BPS TP012

Depth / Level:

0.6m

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
30.9	0.34
63.4	3.07
98.3	3.59
63.4	3.58
30.9	3.51
0	3.20
30.9	3.41
63.4	4.03
98.3	4.20
130.2	4.97
162.2	6.31
195.2	7.66
162.2	7.66
130.2	7.66
98.3	7.65
63.4	7.58
30.9	7.42
0	7.14



Pressures to give 1.25mm settlement

Cycle 1

(y) Settlement mm

Cycle 2(p) Pressure kN/m²

Gradient (p/y)

Correction factor (to 762mm plate)

**(k_s) Modulus of subgrade
reaction kPa/mm**

Approximate CBR (%)

Approximation of CBR from HD 25/94
Design Manual for Roads and Bridges.

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: WSP Eastern & Midlands Region, Lot 2

21OY102

Client: Irish Water

Engineer: Mott MacDonald

Date: 31/01/2022

Tested by: PC

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump D

Test Location Number:
(Pump Station)

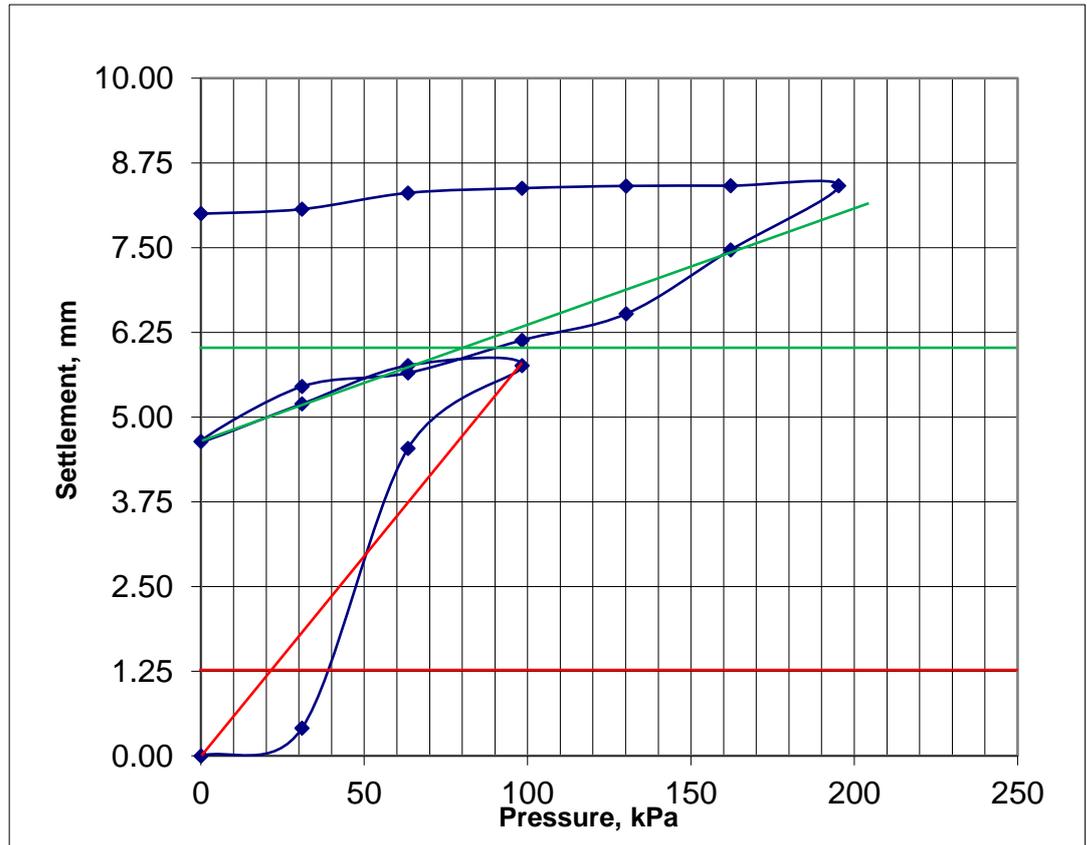
BPS TP018

Depth / Level:

0.7m

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
30.9	0.41
63.4	4.54
98.3	5.76
63.4	5.76
30.9	5.19
0	4.64
30.9	5.45
63.4	5.65
98.3	6.13
130.2	6.52
162.2	7.47
195.2	8.41
162.2	8.41
130.2	8.41
98.3	8.38
63.4	8.31
30.9	8.07
0	8.00



Pressures to give 1.25mm settlement

Cycle 1

(y) Settlement mm

Cycle 2(p) Pressure kN/m²

Gradient (p/y)

Correction factor (to 762mm plate)

**(k_s) Modulus of subgrade
reaction kPa/mm**Approximate CBR (%)
Approximation of CBR from HD 25/94
Design Manual for Roads and Bridges.

IRISH DRILLING LTD.

Loughrea Co. Galway

Tel: (091) 841274

Lab@IrishDrilling.ie

Contract: WSP Eastern & Midlands Region, Lot 2

21OY102

Client: Irish Water

Engineer: Mott MacDonald

Date: 31/01/2022

Tested by: PC

Checked: DCD

Plate Bearing Test: BS 1377:Part 9: 1990

Plate diameter (mm)

600

Pump D

Test Location Number:
(Pump Station)

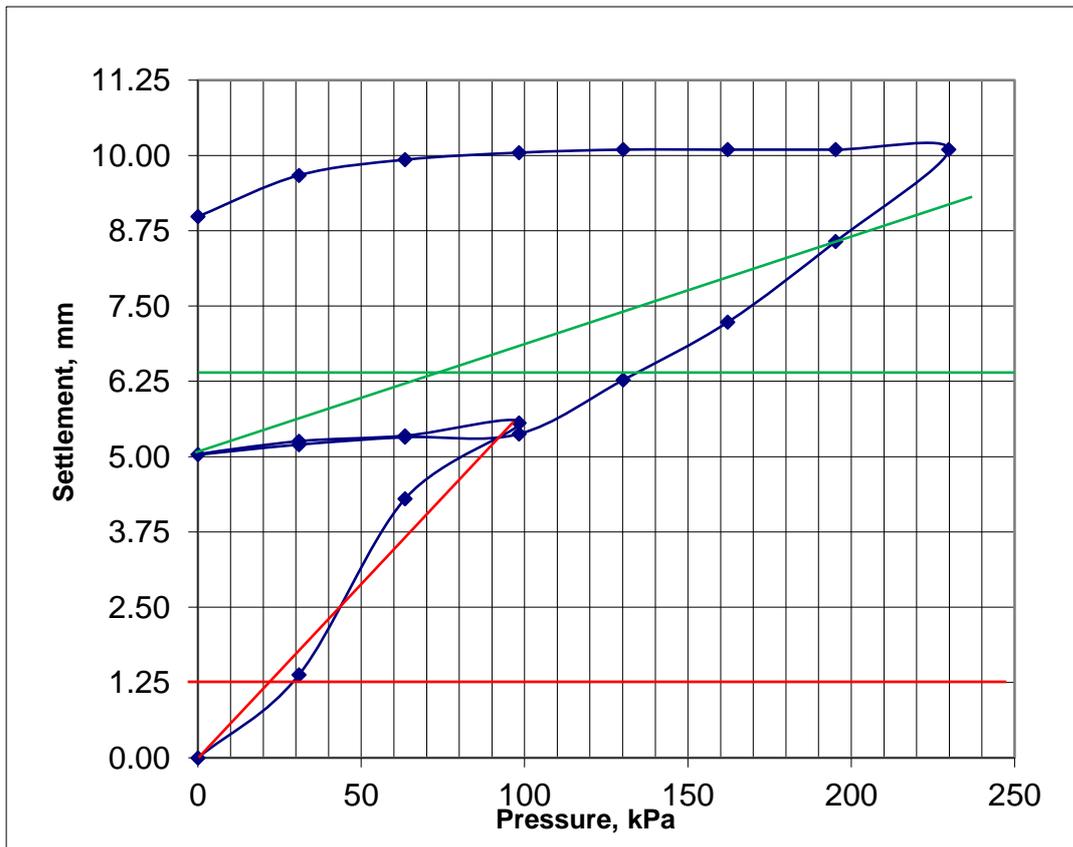
BPS TP020

Depth / Level:

0.5m

PLATE TEST

Pressure kN/m ²	Settlement mm
0	0.00
30.9	1.38
63.4	4.30
98.3	5.56
63.4	5.35
30.9	5.26
0	5.04
30.9	5.20
63.4	5.32
98.3	5.38
130.2	6.27
162.2	7.23
195.2	8.57
229.8	10.10
195.2	10.10
162.2	10.10
130.2	10.10
98.3	10.05
63.4	9.93
30.9	9.67
0	8.99



Pressures to give 1.25mm settlement

Cycle 1

1.25

(y) Settlement mm

Cycle 2

1.25

20

(p) Pressure kN/m²

75

16.00

Gradient (p/y)

60.00

0.829

Correction factor (to 762mm plate)

0.829

13.26

(k_s) Modulus of subgrade
reaction kPa/mm

49.74

0.9

Approximate CBR (%)
Approximation of CBR from HD 25/94
Design Manual for Roads and Bridges.

8.4



Appendix 7F Specialist In-Situ Test Records

N/A

Appendix 7G Geophysics Report

N/A



Appendix 7H

Laboratory Test Results



Plasticity (A-Line) Chart

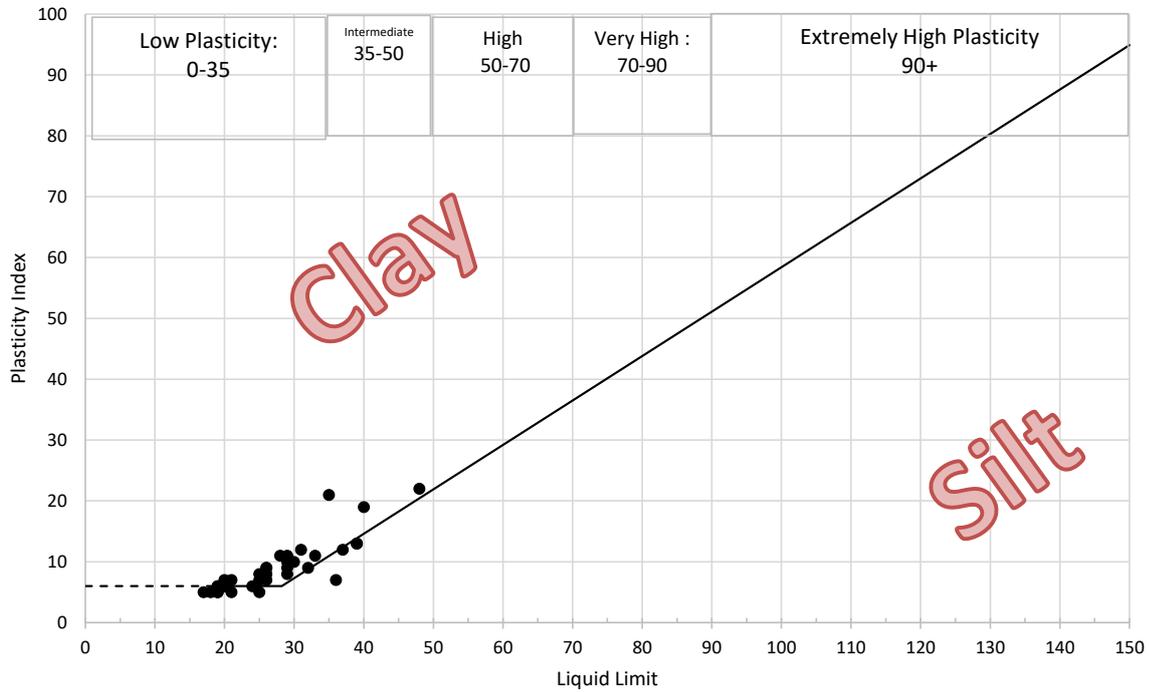
Project Number

Project Name:

WSP Eastern & Midlands Region

Location:

2021OY102



Abbreviations in the remarks column of the Classification Summary Sheet: C = Clay, M = Silt

Plasticity abbreviations: L = Low, I = Intermediate, H = High, V = Very High, E = Extremely High.

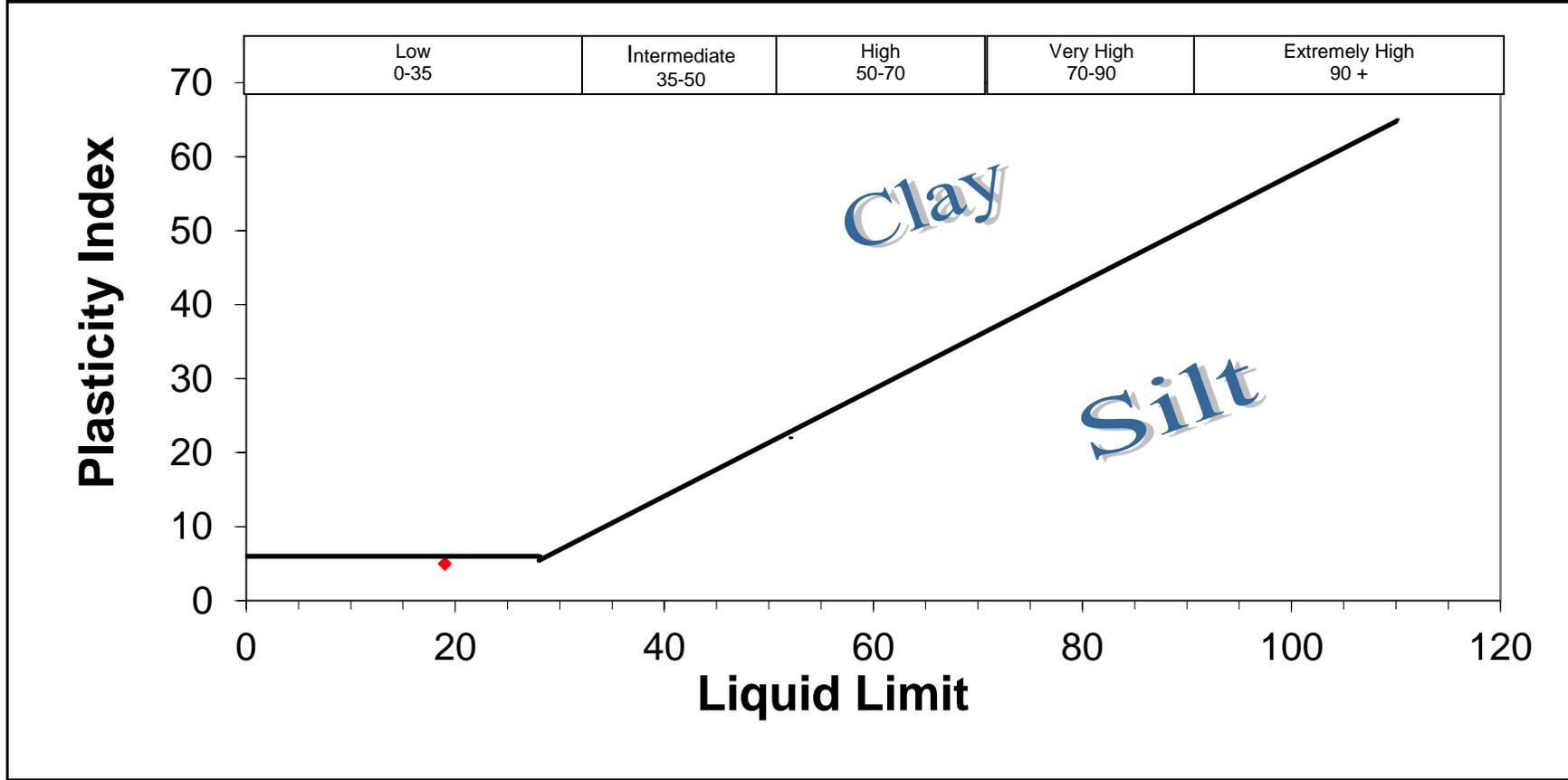
The letter O is added to the symbol of any material containing a significant proportion of organic material.

Chart taken from BS5930: 2010

BCB

QC Form: R1

NMTL LTD Unit 18c, Tullow Industrial Estate Tullow County Carlow Tel: 00353 59 9180822 Mob: 00353 872575508 billa@nmtl.ie	Contract: WSP Eastern and Midlands Region
	Client: Irish Drilling Limited
	Engineer:
	GII Project ID 20210Y201
	Date: 21/07/2022
	Tested By: Sb Checked: Bc
Job ref No. NMTL 3550	

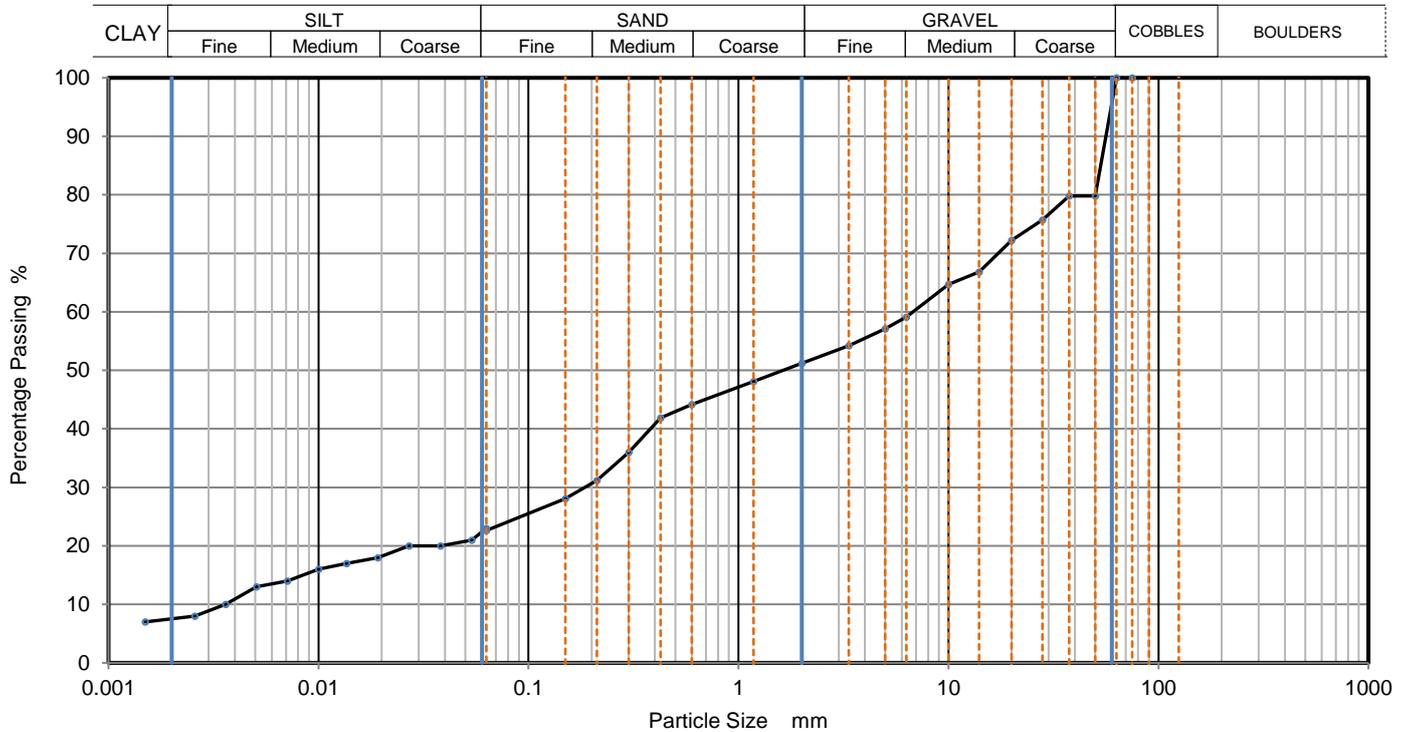




PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH001
Sample No.	10
Depth, m	3.00
Sample Type	B
KeyLAB ID	IDL1202202039

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	23
		0.0536	21
75	100	0.0381	20
63	100	0.0270	20
50	80	0.0192	18
37.5	80	0.0136	17
28	76	0.0100	16
20	72	0.0071	14
14	67	0.0051	13
10	65	0.0036	10
6.3	59	0.0026	8
5	57	0.0015	7
3.35	54		
2	51		
1.18	48		
0.6	44	Particle density (assumed) 2.65 Mg/m ³	
0.425	42		
0.3	36		
0.212	31		
0.15	28		
0.063	23		

Dry Mass of sample, g 1066

Sample Proportions	% dry mass
Very coarse	0
Gravel	49
Sand	29
Silt	15
Clay	8

Grading Analysis	
D100	mm
D60	mm 6.8
D30	mm 0.185
D10	mm 0.00367
Uniformity Coefficient	1900
Curvature Coefficient	1.4

Remarks
Preparation and testing in accordance with BS1377 unless noted below

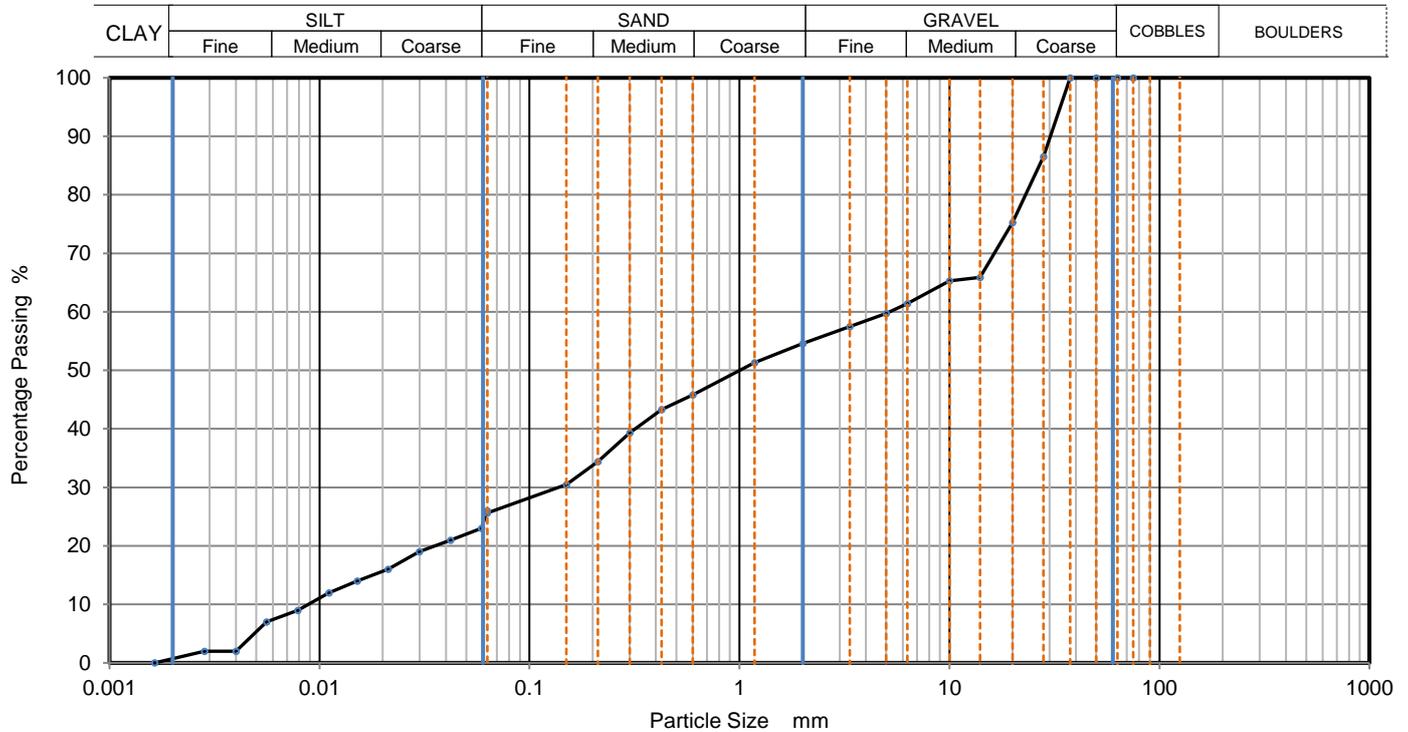
Operator	Checked	Approved	Sheet printed	1
		Dympna Darcy B.Sc.	26/07/2022 17:42	
				QC From No:R2



PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH002
Sample No.	4
Depth, m	1.00
Sample Type	B
KeyLAB ID	IDL120220218144

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown very silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	26
		0.0591	23
75	100	0.0420	21
63	100	0.0299	19
50	100	0.0212	16
37.5	100	0.0151	14
28	87	0.0111	12
20	75	0.0079	9
14	66	0.0056	7
10	65	0.0040	2
6.3	61	0.0028	2
5	60	0.0016	0
3.35	58		
2	55		
1.18	51		
0.6	46		
0.425	43	Particle density (assumed)	
0.3	39	2.65	Mg/m3
0.212	34		
0.15	31		
0.063	26		

Dry Mass of sample, g 842

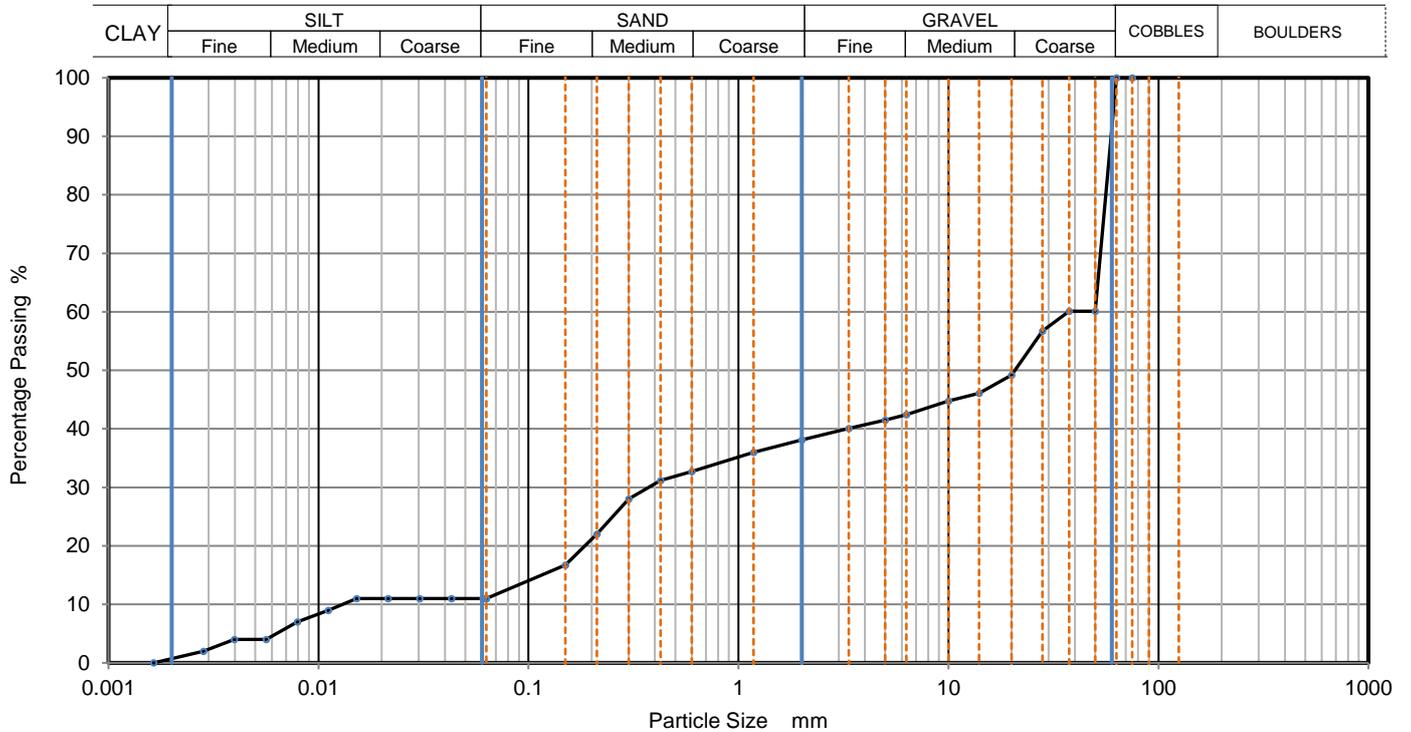
Sample Proportions	% dry mass
Very coarse	0
Gravel	45
Sand	29
Silt	25
Clay	1

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

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	1
		Dympna Darcy B.Sc.	26/07/2022 17:42	
				QC From No:R2

	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH002	
Site Name	WSP Eastern & Midlands Region		Sample No.	10	
Soil Description	Greyish-brown silty very sandy coarse GRAVEL.		Depth, m	3.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220218150	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	11
		0.0607	11
75	100	0.0429	11
63	100	0.0304	11
50	60	0.0215	11
37.5	60	0.0152	11
28	57	0.0111	9
20	49	0.0079	7
14	46	0.0056	4
10	45	0.0040	4
6.3	42	0.0028	2
5	42	0.0016	0
3.35	40		
2	38		
1.18	36		
0.6	33	Particle density (assumed)	
0.425	31	2.65	Mg/m ³
0.3	28		
0.212	22		
0.15	17		
0.063	11		

Dry Mass of sample, g 1071

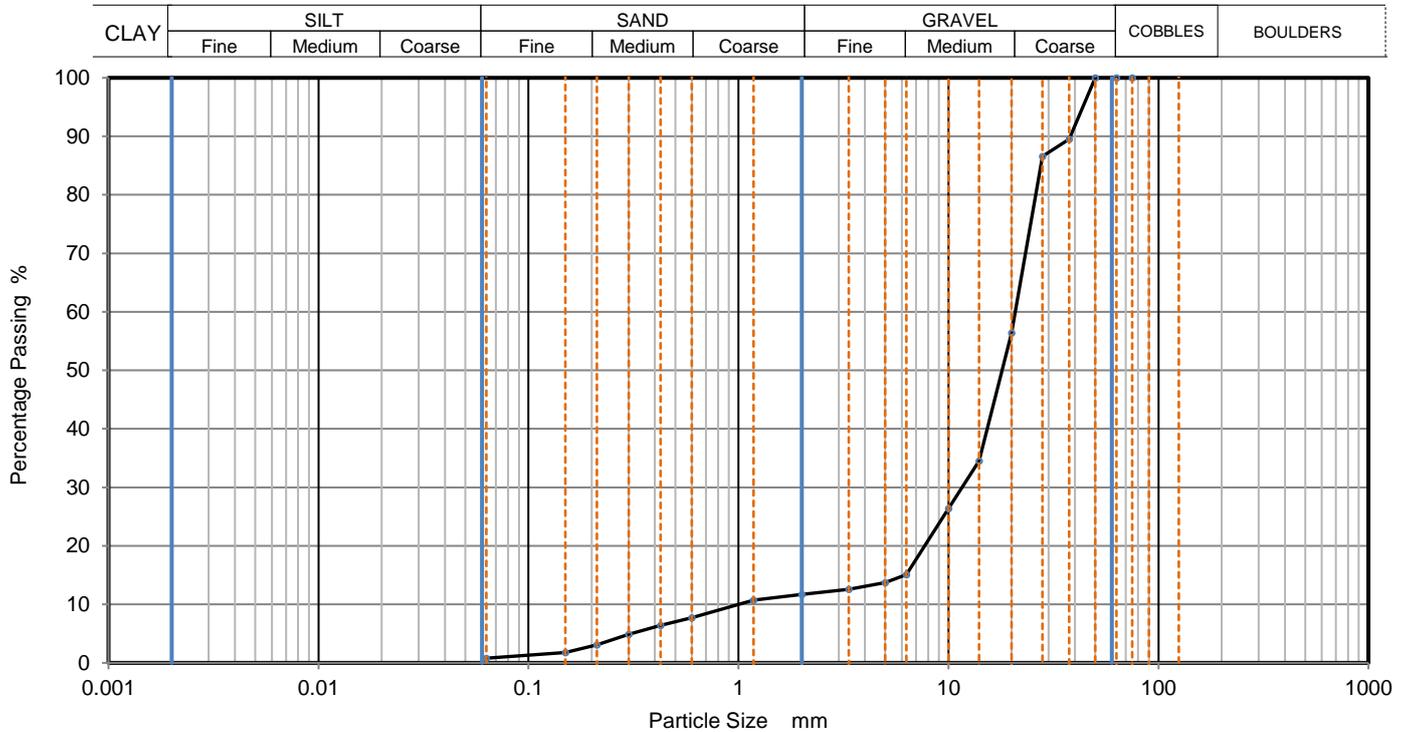
Sample Proportions	% dry mass
Very coarse	0
Gravel	62
Sand	27
Silt	10
Clay	1

Grading Analysis		
D100	mm	
D60	mm	37.3
D30	mm	0.373
D10	mm	0.0132
Uniformity Coefficient		2800
Curvature Coefficient		0.28

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	Approved	Sheet printed	1
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				QC From No:R2

	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH002	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Light grey slightly silty sandy medium and coarse GRAVEL.		Depth, m	3.50	
Specimen Reference		Specimen Depth	m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL12022040627	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	90		
28	87		
20	56		
14	35		
10	26		
6.3	15		
5	14		
3.35	13		
2	12		
1.18	11		
0.6	8		
0.425	6		
0.3	5		
0.212	3		
0.15	2		
0.063	1		

Dry Mass of sample, g 1395

Sample Proportions	% dry mass
Very coarse	0
Gravel	88
Sand	11
Fines <0.063mm	1

Grading Analysis		
D100	mm	
D60	mm	20.8
D30	mm	11.6
D10	mm	1.01
Uniformity Coefficient		21
Curvature Coefficient		6.4

Remarks
Preparation and testing in accordance with BS1377 unless noted below

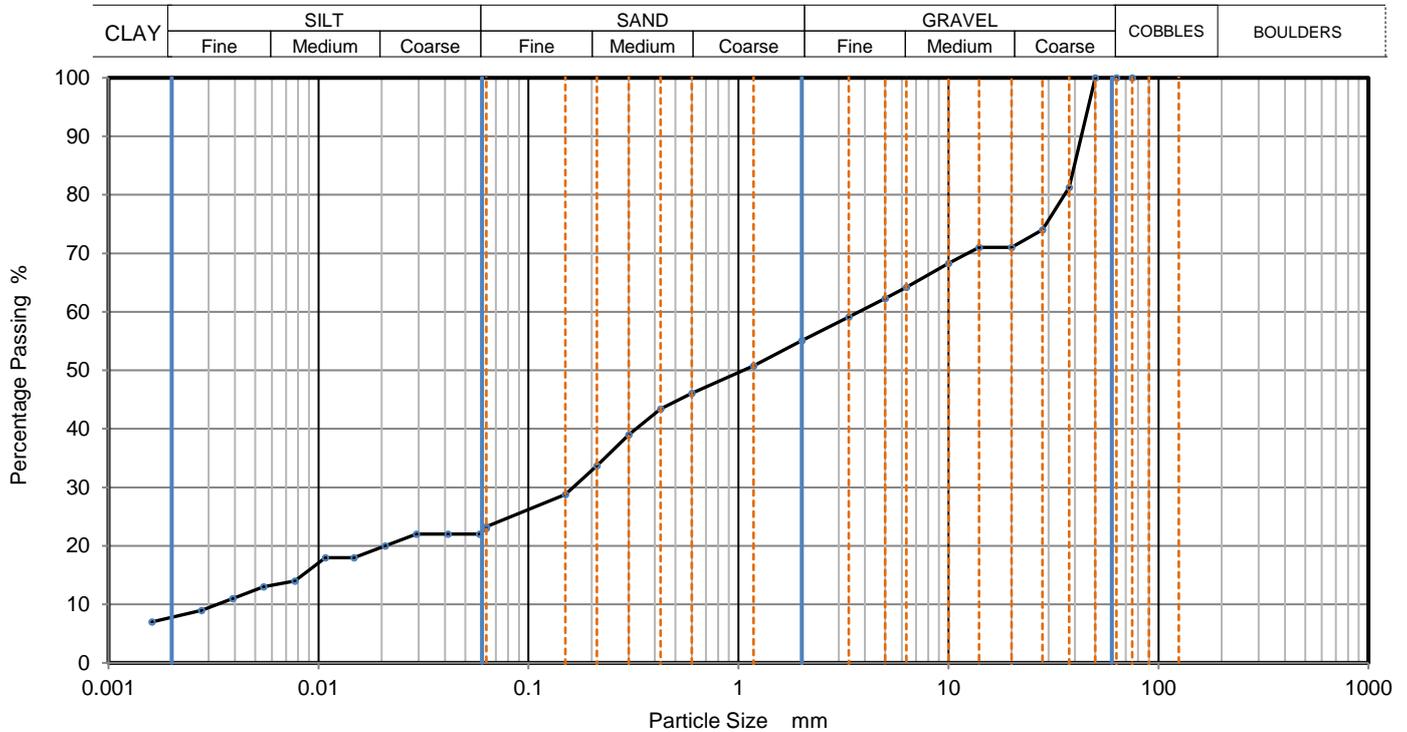
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				QC From No:R2



PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH002
Sample No.	16
Depth, m	5.00
Sample Type	B
KeyLAB ID	IDL120220218156

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brownish-grey very silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	

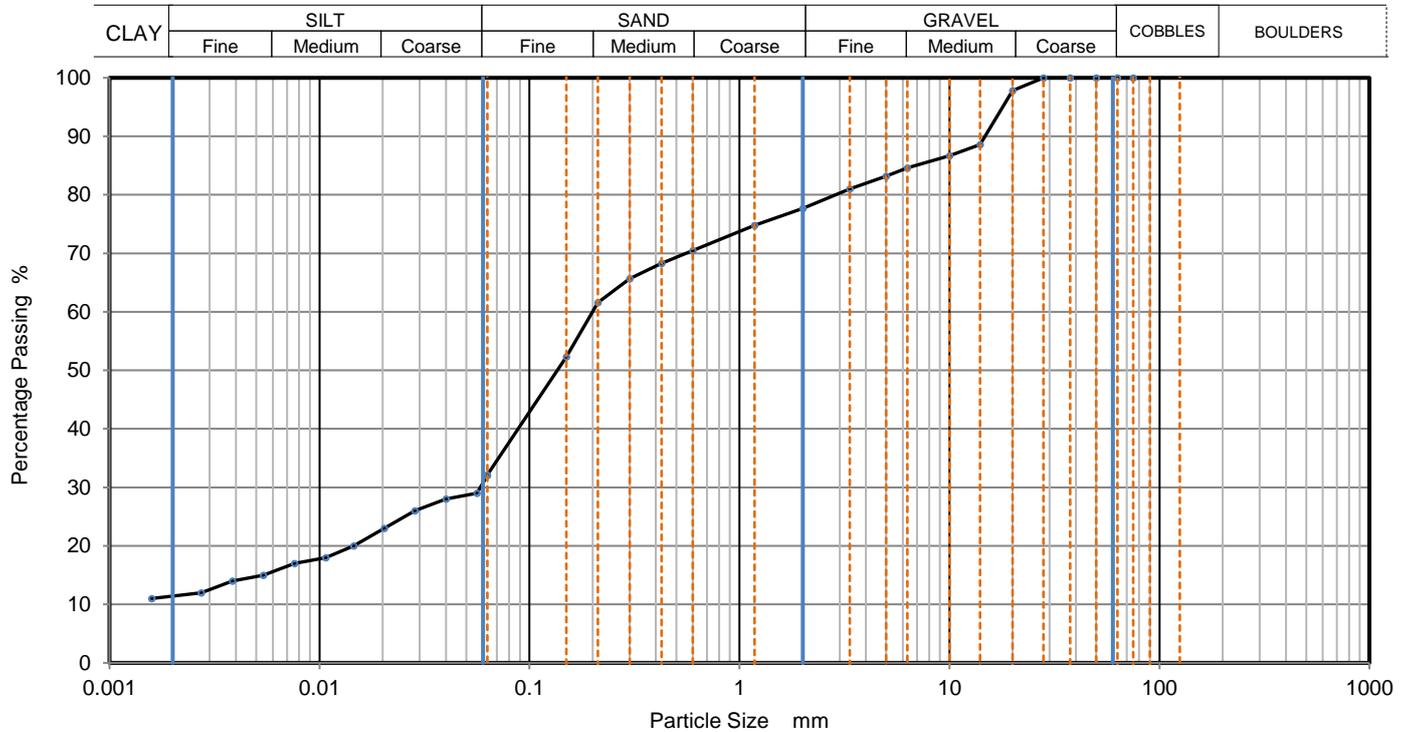




PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH003
Sample No.	7
Depth, m	2.00
Sample Type	B
KeyLAB ID	IDL120220218167

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown very gravelly very silty fine SAND.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	32
		0.0562	29
75	100	0.0400	28
63	100	0.0285	26
50	100	0.0204	23
37.5	100	0.0146	20
28	100	0.0107	18
20	98	0.0076	17
14	89	0.0054	15
10	87	0.0038	14
6.3	85	0.0027	12
5	83	0.0016	11
3.35	81		
2	78		
1.18	75		
0.6	71	Particle density (assumed) 2.65 Mg/m ³	
0.425	68		
0.3	66		
0.212	62		
0.15	52		
0.063	32		

Dry Mass of sample, g 895

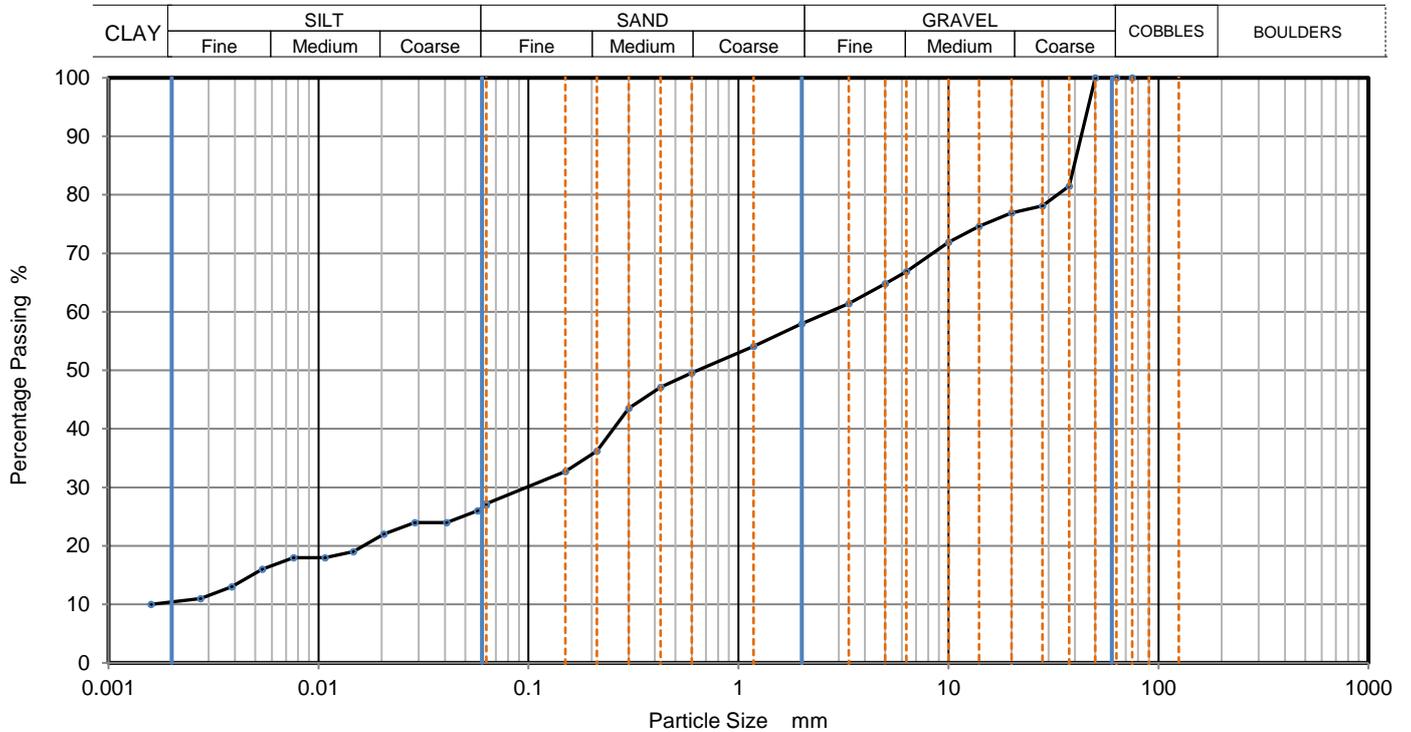
Sample Proportions	% dry mass
Very coarse	0
Gravel	22
Sand	46
Silt	21
Clay	11

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

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH003	
Site Name	WSP Eastern & Midlands Region		Sample No.	13	
Soil Description	Brownish-grey very silty very sandy coarse GRAVEL.		Depth, m	4.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220218173	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	27
		0.0573	26
75	100	0.0407	24
63	100	0.0288	24
50	100	0.0205	22
37.5	82	0.0146	19
28	78	0.0108	18
20	77	0.0076	18
14	75	0.0054	16
10	72	0.0039	13
6.3	67	0.0027	11
5	65	0.0016	10
3.35	61		
2	58		
1.18	54		
0.6	50	Particle density (assumed)	
0.425	47	2.65	Mg/m3
0.3	44		
0.212	36		
0.15	33		
0.063	27		

Dry Mass of sample, g 1038

Sample Proportions	% dry mass
Very coarse	0
Gravel	42
Sand	31
Silt	17
Clay	10

Grading Analysis		
D100	mm	
D60	mm	2.71
D30	mm	0.0976
D10	mm	0.00183
Uniformity Coefficient		1500
Curvature Coefficient		1.9

Remarks
Preparation and testing in accordance with BS1377 unless noted below

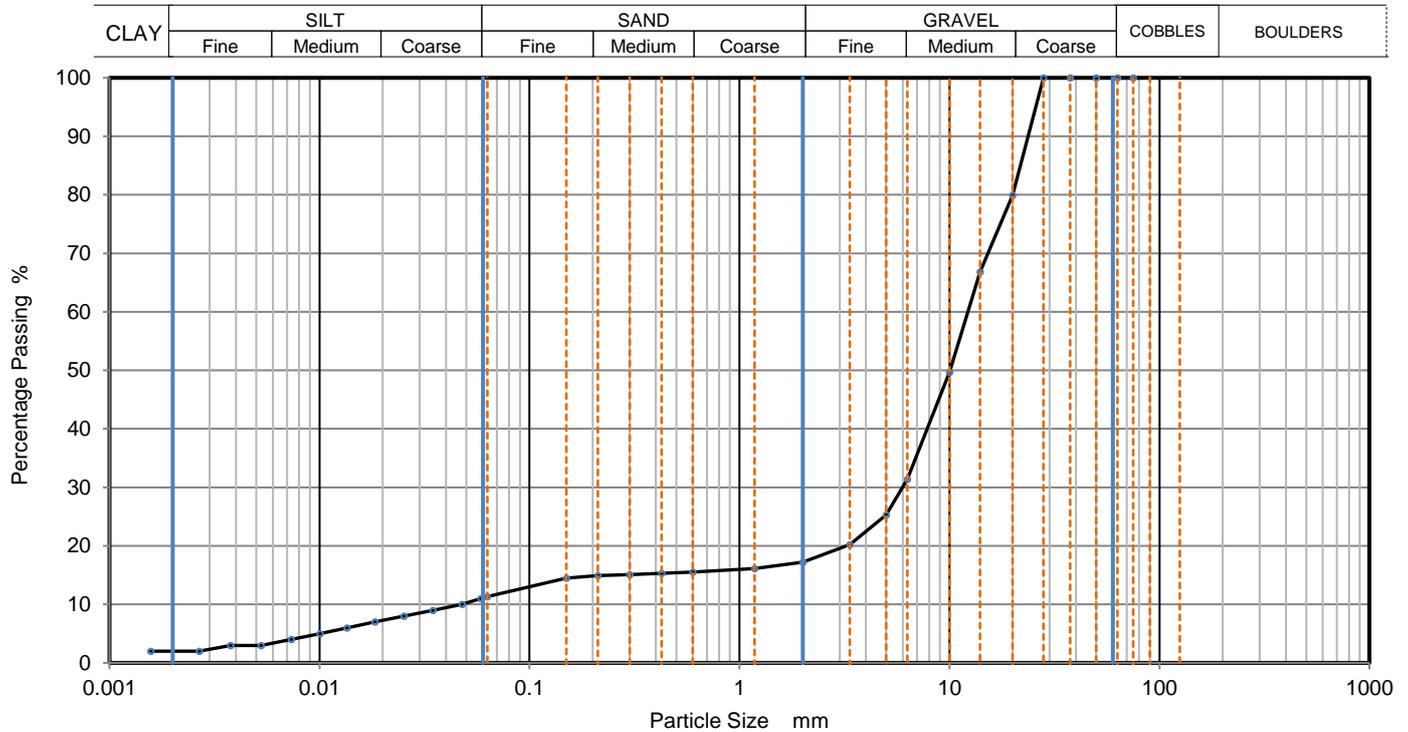
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH003
Sample No.	
Depth, m	8.50
Sample Type	C
KeyLAB ID	IDL120220511105

Site Name	WSP Eastern & Midlands Region		
Soil Description	Cream sandy silty medium GRAVEL.		
Specimen Reference	Specimen Depth	10	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0586	11
		0.0478	10
75	100	0.0346	9
63	100	0.0253	8
50	100	0.0184	7
37.5	100	0.0135	6
28	100	0.0101	5
20	80	0.0073	4
14	67	0.0053	3
10	50	0.0038	3
6.3	31	0.0027	2
5	25	0.0016	2
3.35	20		
2	17		
1.18	16		
0.6	16	Particle density (assumed) 2.65 Mg/m ³	
0.425	15		
0.3	15		
0.212	15		
0.15	15		
0.063	11		

Dry Mass of sample, g 419

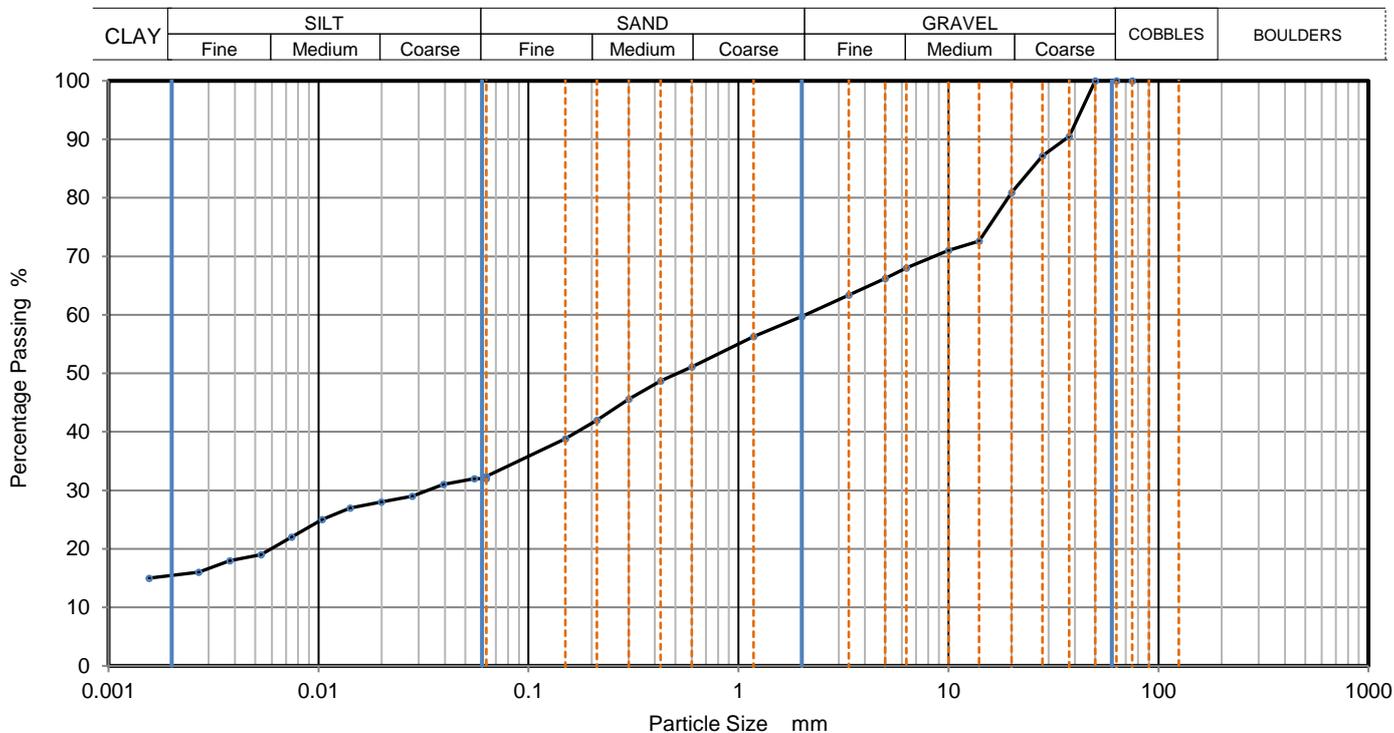
Sample Proportions	% dry mass
Very coarse	0
Gravel	83
Sand	6
Silt	9
Clay	2

Grading Analysis		
D100	mm	
D60	mm	12.2
D30	mm	5.97
D10	mm	0.0464
Uniformity Coefficient		260
Curvature Coefficient		63

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH004	
Site Name	WSP Eastern & Midlands Region		Sample No.	4	
Soil Description	Brownish-grey very sandy very silty coarse GRAVEL.		Depth, m	1.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220218181	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	32
		0.0552	32
75	100	0.0393	31
63	100	0.0280	29
50	100	0.0199	28
37.5	91	0.0141	27
28	87	0.0104	25
20	81	0.0074	22
14	73	0.0053	19
10	71	0.0038	18
6.3	68	0.0027	16
5	66	0.0016	15
3.35	63		
2	60		
1.18	56		
0.6	51	Particle density (assumed)	
0.425	49	2.65	Mg/m3
0.3	46		
0.212	42		
0.15	39		
0.063	32		

Dry Mass of sample, g

992

Sample Proportions	% dry mass
Very coarse	0
Gravel	40
Sand	27
Silt	17
Clay	15

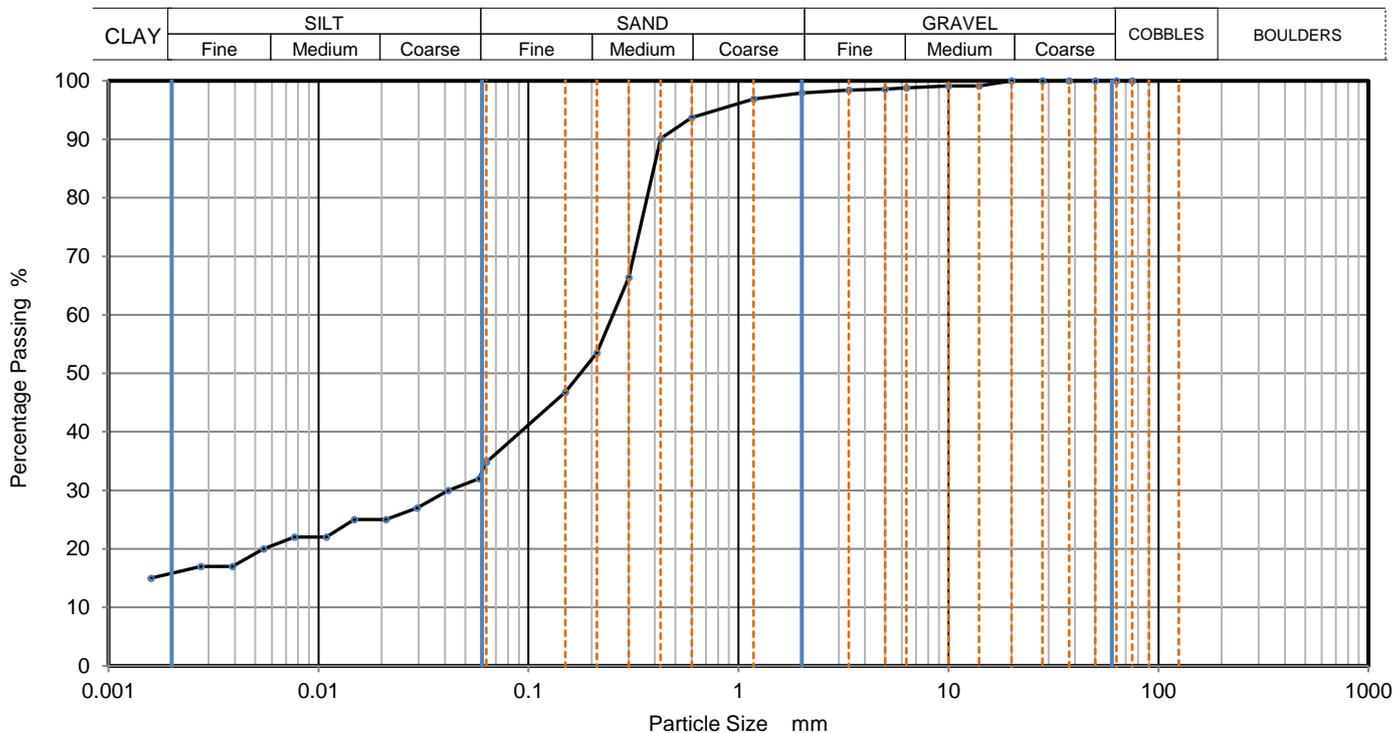
Grading Analysis		
D100	mm	
D60	mm	2.09
D30	mm	0.0317
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH004	
Site Name	WSP Eastern & Midlands Region		Sample No.	13	
Soil Description	Brownish-grey slightly gravelly sandy SILT. Sand is medium.		Depth, m	4.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220218190	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	35
		0.0583	32
75	100	0.0415	30
63	100	0.0295	27
50	100	0.0210	25
37.5	100	0.0148	25
28	100	0.0109	22
20	100	0.0077	22
14	99	0.0055	20
10	99	0.0039	17
6.3	99	0.0027	17
5	99	0.0016	15
3.35	98		
2	98		
1.18	97		
0.6	94	Particle density (assumed)	
0.425	90	2.65	Mg/m ³
0.3	66		
0.212	54		
0.15	47		
0.063	35		

Dry Mass of sample, g

871

Sample Proportions	% dry mass
Very coarse	0
Gravel	2
Sand	63
Silt	19
Clay	16

Grading Analysis		
D100	mm	
D60	mm	0.253
D30	mm	0.0424
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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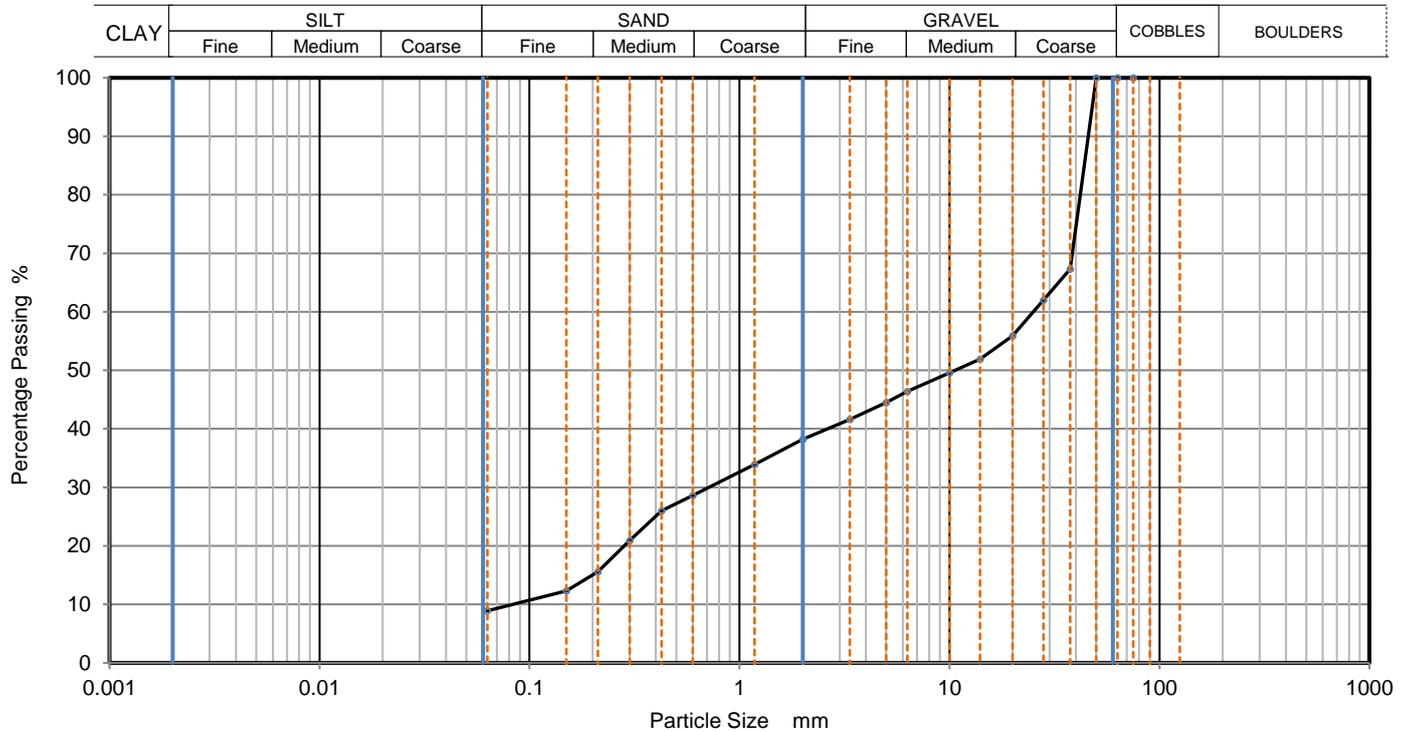
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH004
Sample No.	19
Depth, m	6.00
Sample Type	B
KeyLAB ID	IDL120220218196

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brownish-grey silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	67		
28	62		
20	56		
14	52		
10	50		
6.3	46		
5	45		
3.35	42		
2	38		
1.18	34		
0.6	29		
0.425	26		
0.3	21		
0.212	16		
0.15	12		
0.063	9		

Dry Mass of sample, g 1076

Sample Proportions	% dry mass
Very coarse	0
Gravel	62
Sand	29
Fines <0.063mm	9

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	300
Curvature Coefficient	0.24

Remarks
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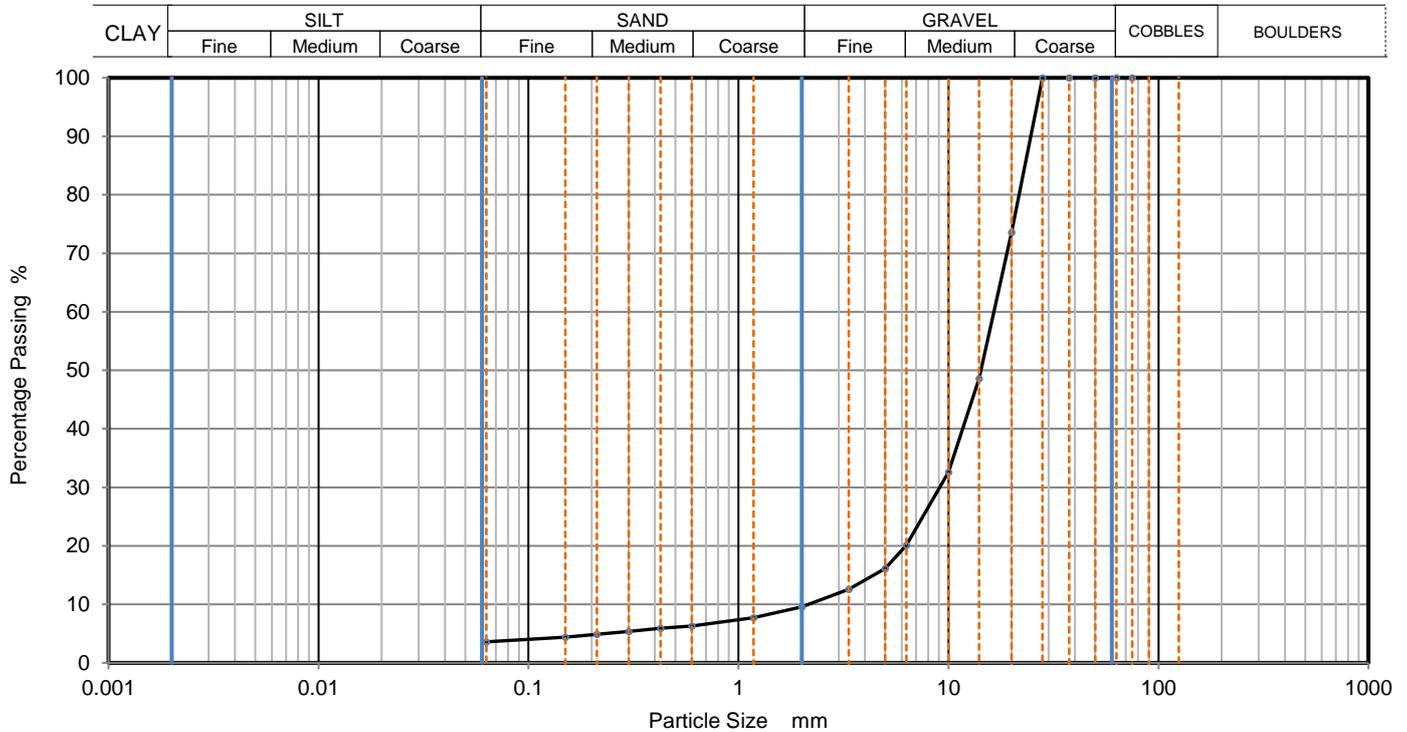
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH004
Sample No.	
Depth, m	7.20
Sample Type	C
KeyLAB ID	IDL120220221253

Site Name	WSP Eastern & Midlands Region	
Soil Description	Core: Cream-grey slightly silty sandy medium GRAVEL.	
Specimen Reference	Specimen Depth	7.4-7.5 m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	74		
14	49		
10	33		
6.3	20		
5	16		
3.35	13		
2	10		
1.18	8		
0.6	6		
0.425	6		
0.3	5		
0.212	5		
0.15	4		
0.063	4		

Dry Mass of sample, g 376

Sample Proportions	% dry mass
Very coarse	0
Gravel	90
Sand	6
Fines <0.063mm	4

Grading Analysis		
D100	mm	
D60	mm	16.5
D30	mm	9.08
D10	mm	2.13
Uniformity Coefficient		7.7
Curvature Coefficient		2.3

Remarks
Preparation and testing in accordance with BS1377 unless noted below

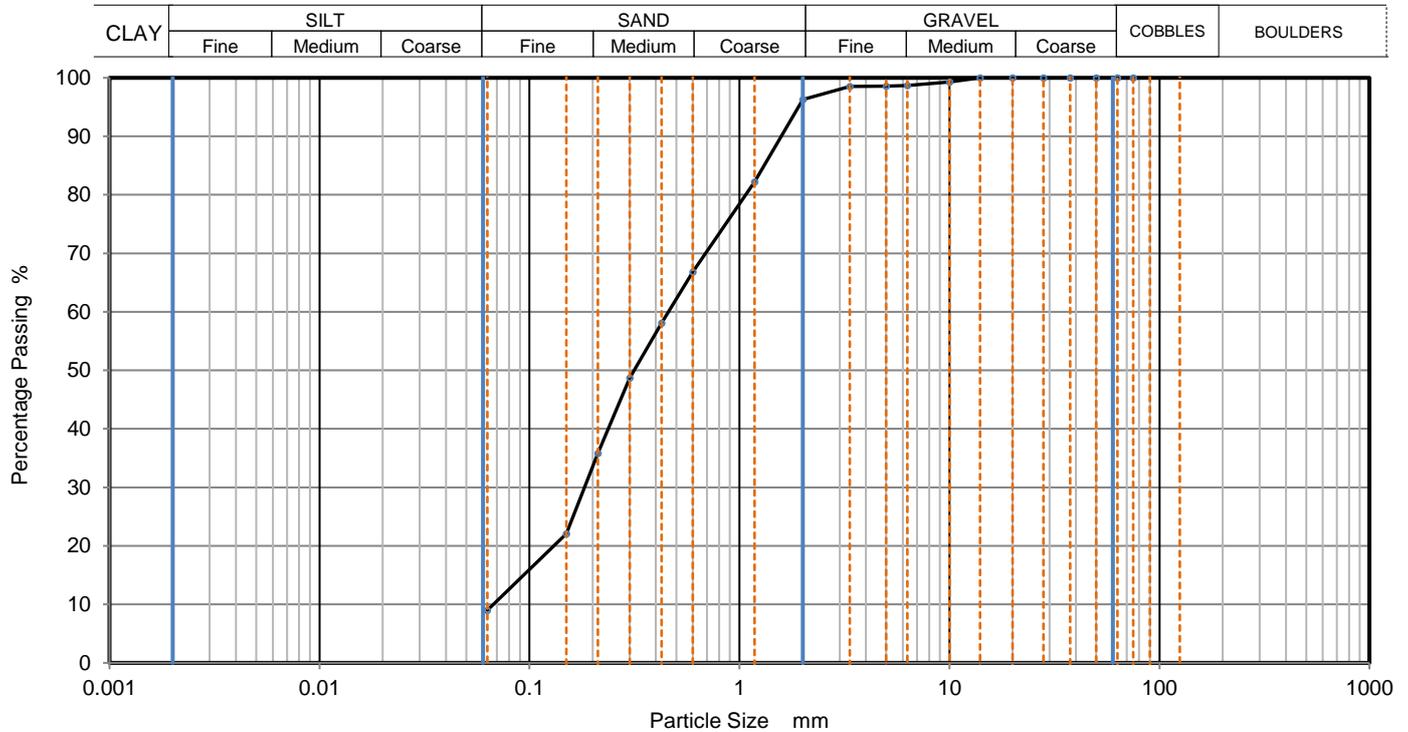
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH004
Sample No.	
Depth, m	10.00
Sample Type	C
KeyLAB ID	IDL120220221256

Site Name	WSP Eastern & Midlands Region		
Soil Description	Core: Grey-yellow slightly gravelly silty SAND.		
Specimen Reference	Specimen Depth	10.2	m
Test Method	BS1377:Part 2:1990, clause 9.2		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	99		
2	96		
1.18	82		
0.6	67		
0.425	58		
0.3	49		
0.212	36		
0.15	22		
0.063	9		

Dry Mass of sample, g 395

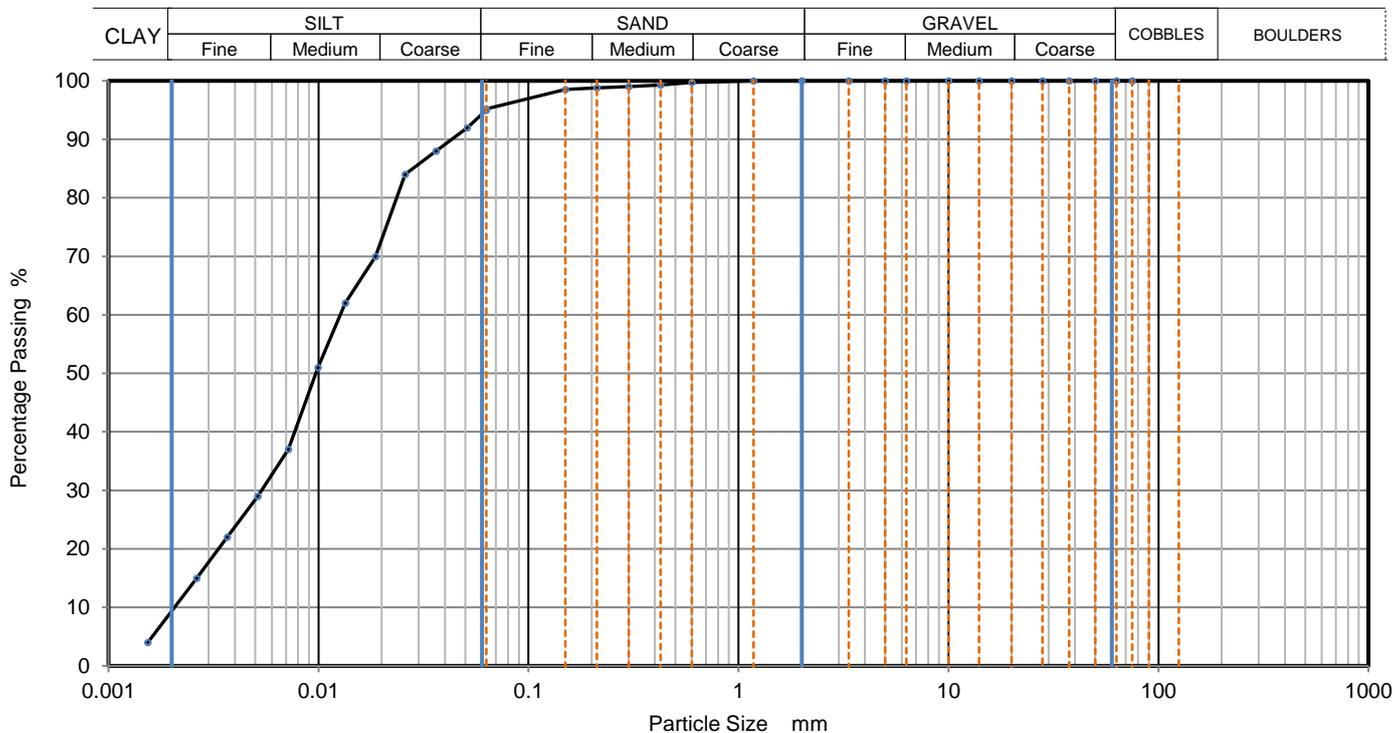
Sample Proportions	% dry mass
Very coarse	0
Gravel	4
Sand	87
Fines <0.063mm	9

Grading Analysis		
D100	mm	
D60	mm	0.458
D30	mm	0.183
D10	mm	0.0674
Uniformity Coefficient		6.8
Curvature Coefficient		1.1

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH004	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Core: Cream-yellow slightly sandy SILT.		Depth, m	11.40	
Specimen Reference		Specimen Depth	11.4-12.9 m	Sample Type	C
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220221257	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	95
		0.0510	92
75	100	0.0363	88
63	100	0.0258	84
50	100	0.0187	70
37.5	100	0.0134	62
28	100	0.0100	51
20	100	0.0072	37
14	100	0.0051	29
10	100	0.0037	22
6.3	100	0.0026	15
5	100	0.0015	4
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density (assumed)	
0.425	99	2.65	Mg/m3
0.3	99		
0.212	99		
0.15	99		
0.063	95		

Dry Mass of sample, g

470

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	5
Silt	86
Clay	9

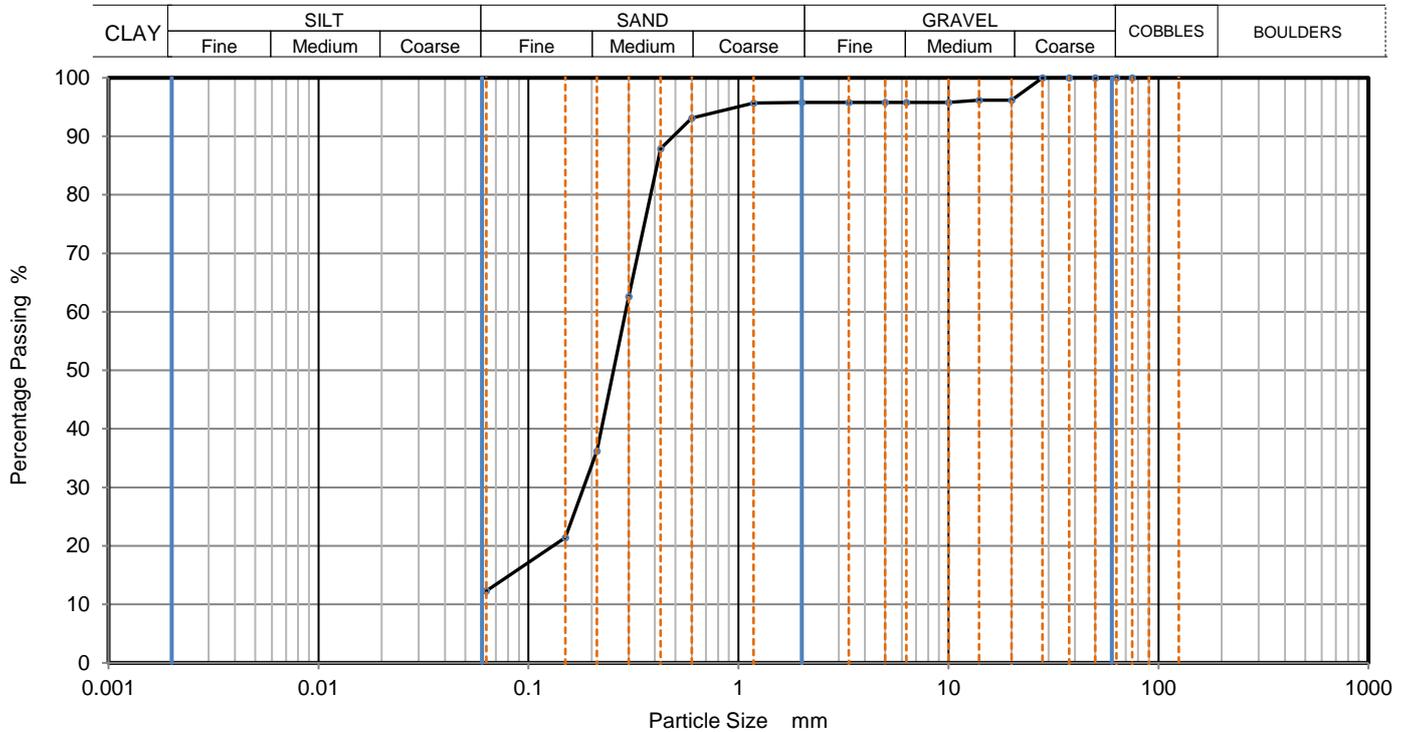
Grading Analysis		
D100	mm	
D60	mm	0.0126
D30	mm	0.00531
D10	mm	0.00209
Uniformity Coefficient		6
Curvature Coefficient		1.1

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH005	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Cream slightly gravelly silty medium SAND.		Depth, m	9.50	
Specimen Reference		Specimen Depth	m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220406158	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	96		
10	96		
6.3	96		
5	96		
3.35	96		
2	96		
1.18	96		
0.6	93		
0.425	88		
0.3	63		
0.212	36		
0.15	21		
0.063	12		

Dry Mass of sample, g 932

Sample Proportions	% dry mass
Very coarse	0
Gravel	4
Sand	84
Fines <0.063mm	12

Grading Analysis	
D100	mm
D60	mm 0.29
D30	mm 0.184
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
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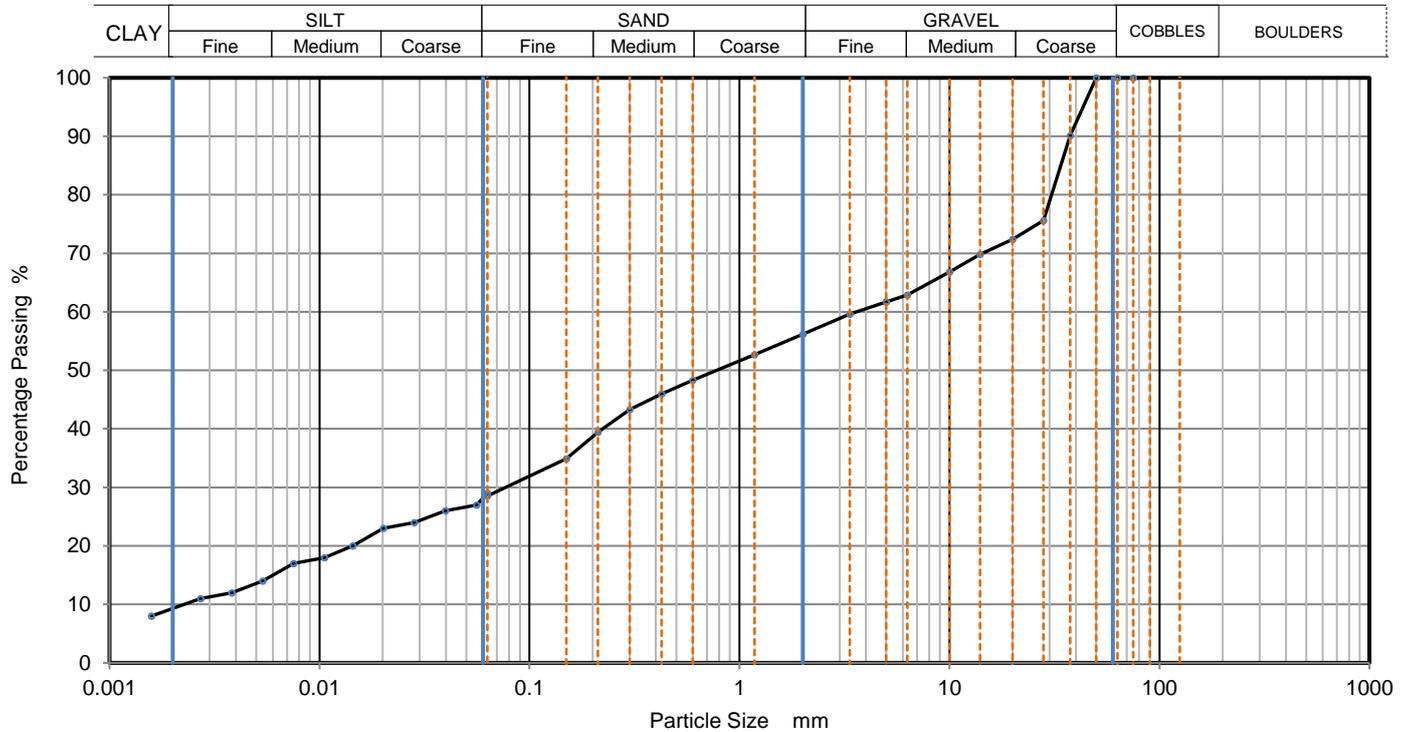
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH006
Sample No.	7
Depth, m	2.00
Sample Type	B
KeyLAB ID	IDL120220218205

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	29
		0.0559	27
75	100	0.0398	26
63	100	0.0283	24
50	100	0.0201	23
37.5	90	0.0144	20
28	76	0.0106	18
20	72	0.0075	17
14	70	0.0054	14
10	67	0.0038	12
6.3	63	0.0027	11
5	62	0.0016	8
3.35	60		
2	56		
1.18	53		
0.6	48	Particle density (assumed) 2.65 Mg/m ³	
0.425	46		
0.3	43		
0.212	39		
0.15	35		
0.063	29		

Dry Mass of sample, g 1276

Sample Proportions	% dry mass
Very coarse	0
Gravel	44
Sand	28
Silt	20
Clay	9

Grading Analysis		
D100	mm	
D60	mm	3.64
D30	mm	0.0769
D10	mm	0.00248
Uniformity Coefficient		1500
Curvature Coefficient		0.66

Remarks
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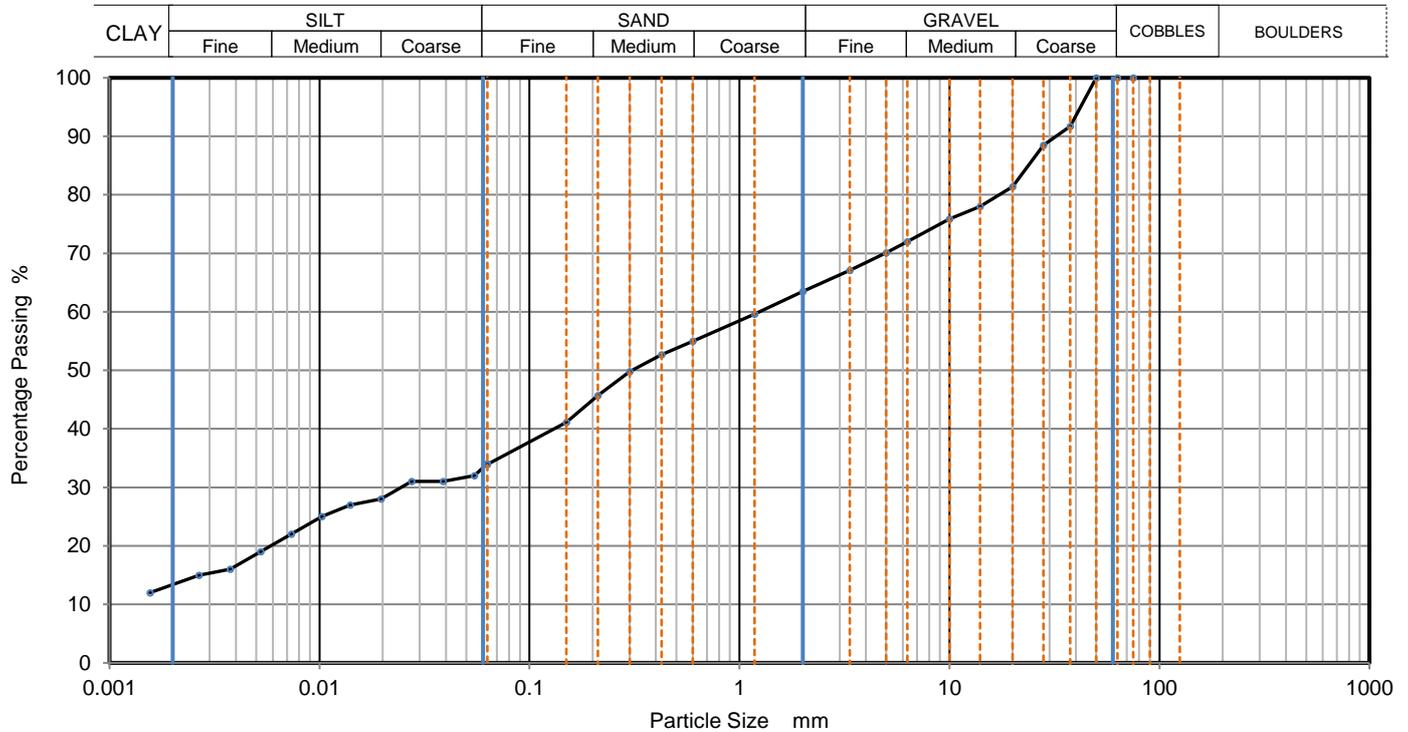
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH007
Sample No.	10
Depth, m	3.00
Sample Type	B
KeyLAB ID	IDL120220218223

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	34
		0.0546	32
75	100	0.0388	31
63	100	0.0275	31
50	100	0.0196	28
37.5	92	0.0140	27
28	89	0.0103	25
20	81	0.0073	22
14	78	0.0053	19
10	76	0.0038	16
6.3	72	0.0027	15
5	70	0.0016	12
3.35	67		
2	64		
1.18	60		
0.6	55	Particle density (assumed) 2.65 Mg/m ³	
0.425	53		
0.3	50		
0.212	46		
0.15	41		
0.063	34		

Dry Mass of sample, g 975

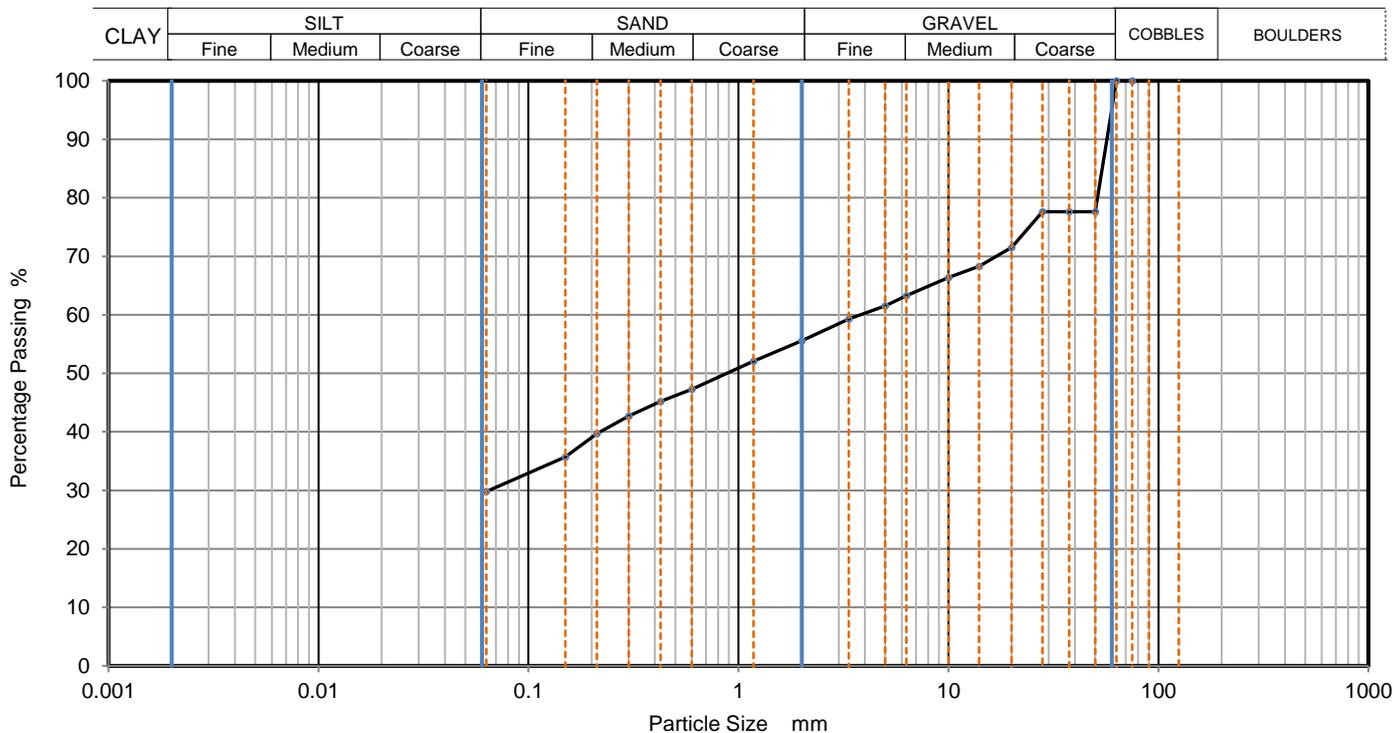
Sample Proportions	% dry mass
Very coarse	0
Gravel	37
Sand	30
Silt	21
Clay	13

Grading Analysis		
D100	mm	
D60	mm	1.25
D30	mm	0.0246
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH008	
Site Name	WSP Eastern & Midlands Region		Sample No.	10	
Soil Description	Light brown very sandy very silty coarse GRAVEL.		Depth, m	3.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220201235	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	78		
37.5	78		
28	78		
20	72		
14	68		
10	66		
6.3	63		
5	62		
3.35	59		
2	56		
1.18	52		
0.6	47		
0.425	45		
0.3	43		
0.212	40		
0.15	36		
0.063	30		

Dry Mass of sample, g

903

Sample Proportions	% dry mass
Very coarse	0
Gravel	44
Sand	26
Fines <0.063mm	30

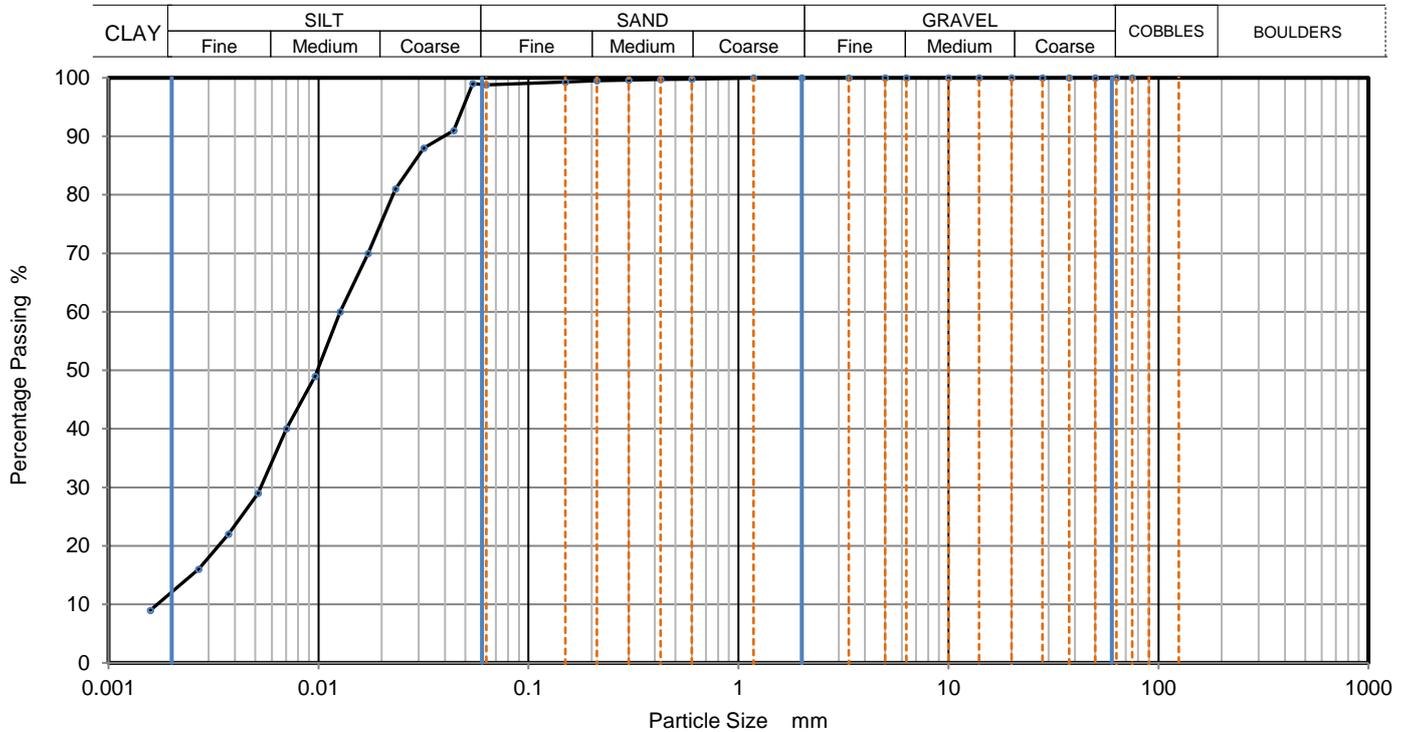
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH008	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Core: Yellow SILT.		Depth, m	13.00	
Specimen Reference		Specimen Depth	13.1-14.4 m	Sample Type	C
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220221271	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0542	99
		0.0440	91
75	100	0.0317	88
63	100	0.0232	81
50	100	0.0173	70
37.5	100	0.0127	60
28	100	0.0096	49
20	100	0.0070	40
14	100	0.0052	29
10	100	0.0037	22
6.3	100	0.0027	16
5	100	0.0016	9
3.35	100		
2	100		
1.18	100		
0.6	100	Particle density (assumed)	
0.425	100	2.65	Mg/m3
0.3	100		
0.212	100		
0.15	99		
0.063	99		

Dry Mass of sample, g 403

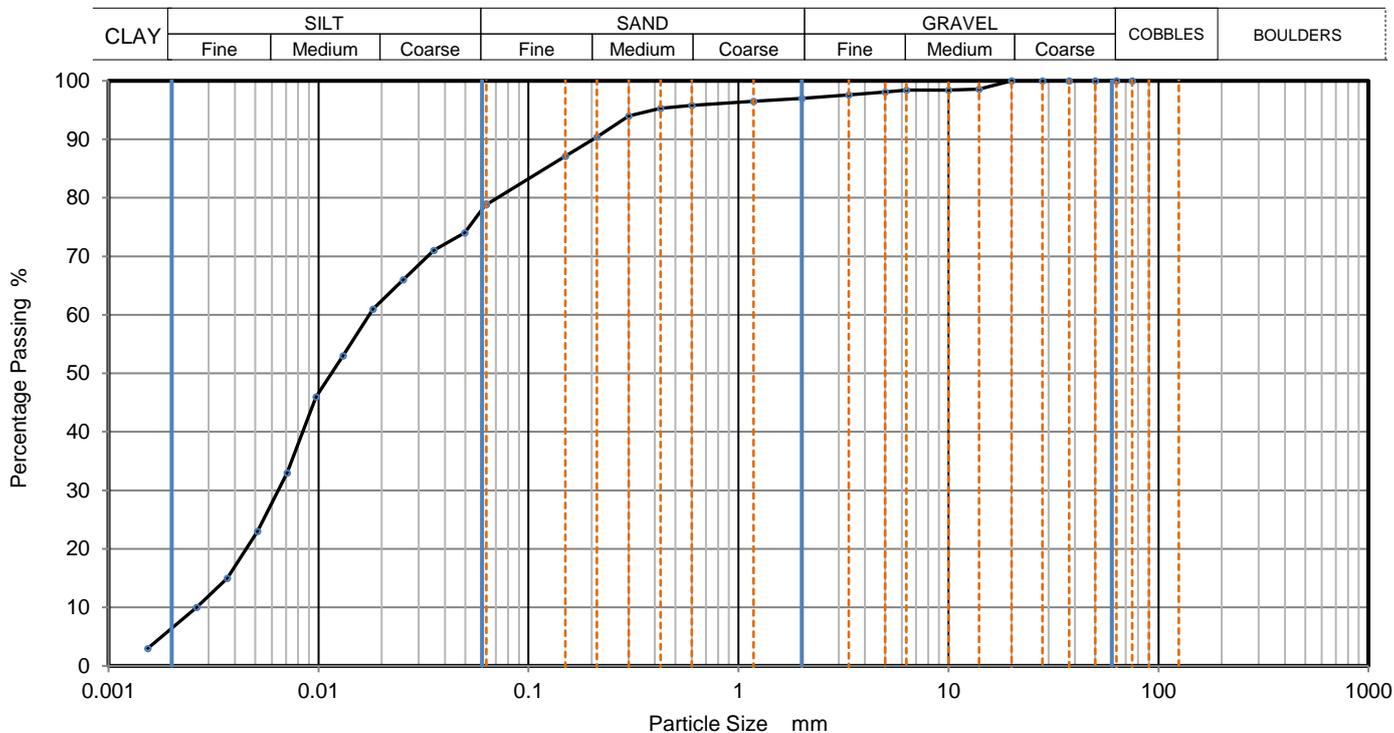
Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	1
Silt	86
Clay	12

Grading Analysis		
D100	mm	
D60	mm	0.0126
D30	mm	0.00527
D10	mm	0.00168
Uniformity Coefficient		7.5
Curvature Coefficient		1.3

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH008	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Yellow slightly gravelly sandy SILT.		Depth, m	15.00	
Specimen Reference		Specimen Depth	15.8-16.0 m	Sample Type	C
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120220221274	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	79
		0.0497	74
75	100	0.0354	71
63	100	0.0253	66
50	100	0.0182	61
37.5	100	0.0131	53
28	100	0.0097	46
20	100	0.0071	33
14	99	0.0051	23
10	98	0.0037	15
6.3	98	0.0026	10
5	98	0.0015	3
3.35	98		
2	97		
1.18	97		
0.6	96	Particle density (assumed)	
0.425	95	2.65	Mg/m3
0.3	94		
0.212	90		
0.15	87		
0.063	79		

Dry Mass of sample, g

705

Sample Proportions	% dry mass
Very coarse	0
Gravel	3
Sand	18
Silt	73
Clay	6

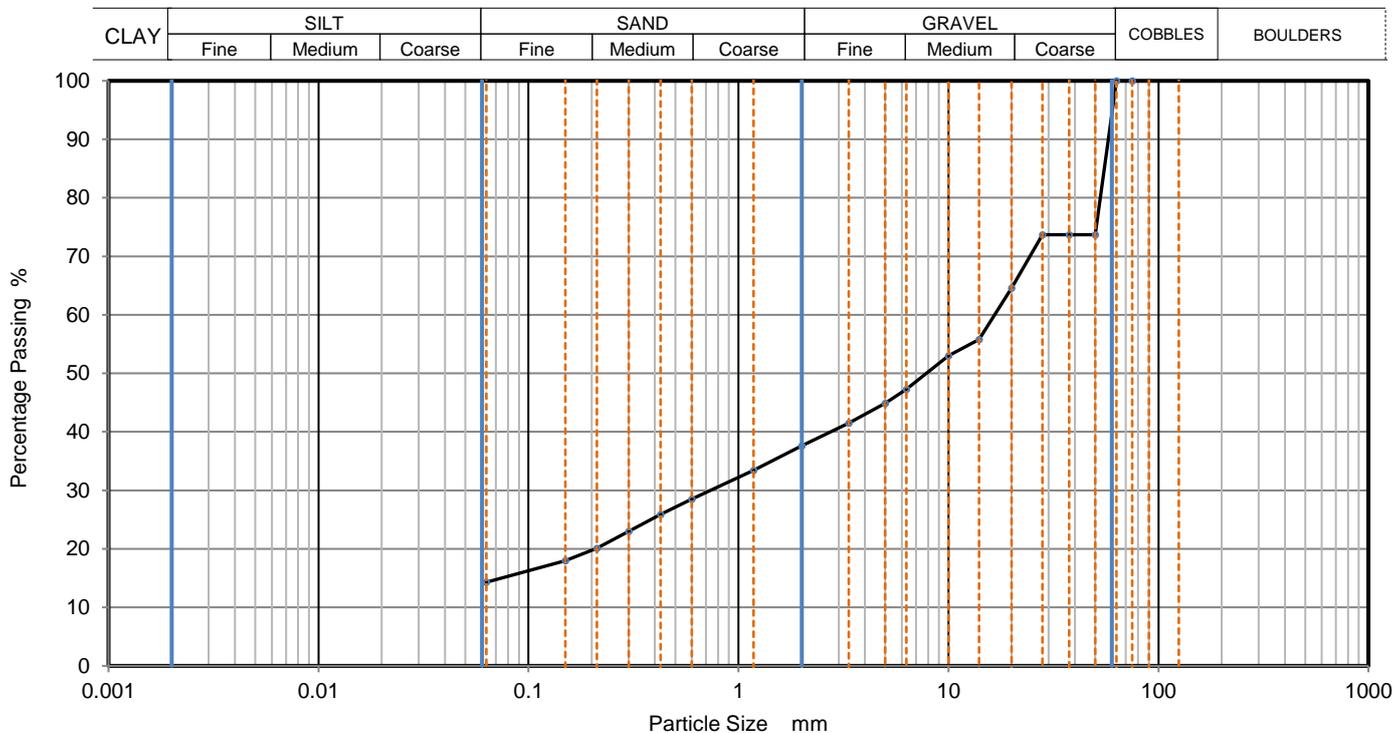
Grading Analysis		
D100	mm	
D60	mm	0.0174
D30	mm	0.00642
D10	mm	0.0026
Uniformity Coefficient		6.7
Curvature Coefficient		0.91

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH009	
Site Name	WSP Eastern & Midlands Region		Sample No.	4	
Soil Description	Brownish-grey very sandy very silty coarse GRAVEL.		Depth, m	1.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220201249	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	74		
37.5	74		
28	74		
20	65		
14	56		
10	53		
6.3	47		
5	45		
3.35	42		
2	38		
1.18	33		
0.6	29		
0.425	26		
0.3	23		
0.212	20		
0.15	18		
0.063	14		

Dry Mass of sample, g

1149

Sample Proportions	% dry mass
Very coarse	0
Gravel	62
Sand	23
Fines <0.063mm	14

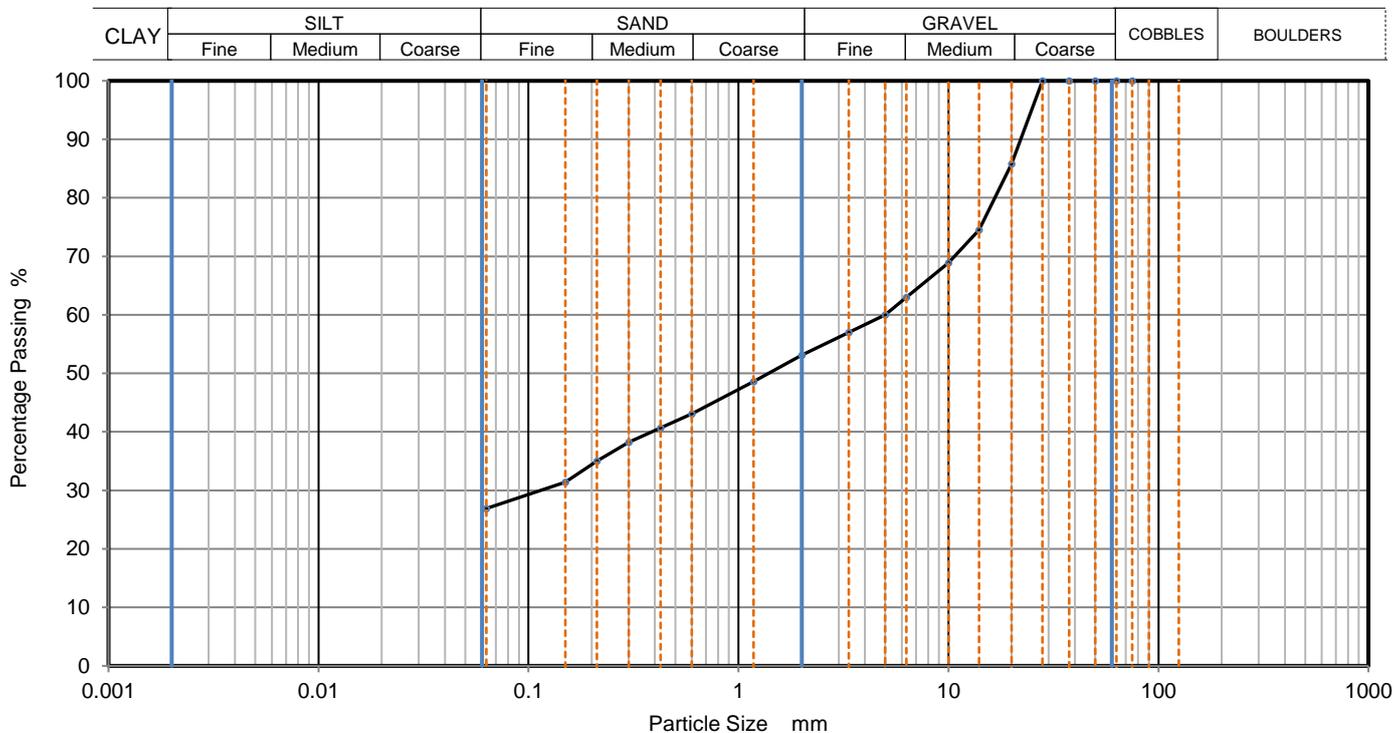
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH009	
Site Name	WSP Eastern & Midlands Region		Sample No.	7	
Soil Description	Brown very sandy very silty medium GRAVEL.		Depth, m	2.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220201252	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	86		
14	75		
10	69		
6.3	63		
5	60		
3.35	57		
2	53		
1.18	49		
0.6	43		
0.425	41		
0.3	38		
0.212	35		
0.15	31		
0.063	27		

Dry Mass of sample, g

1005

Sample Proportions	% dry mass
Very coarse	0
Gravel	47
Sand	26
Fines <0.063mm	27

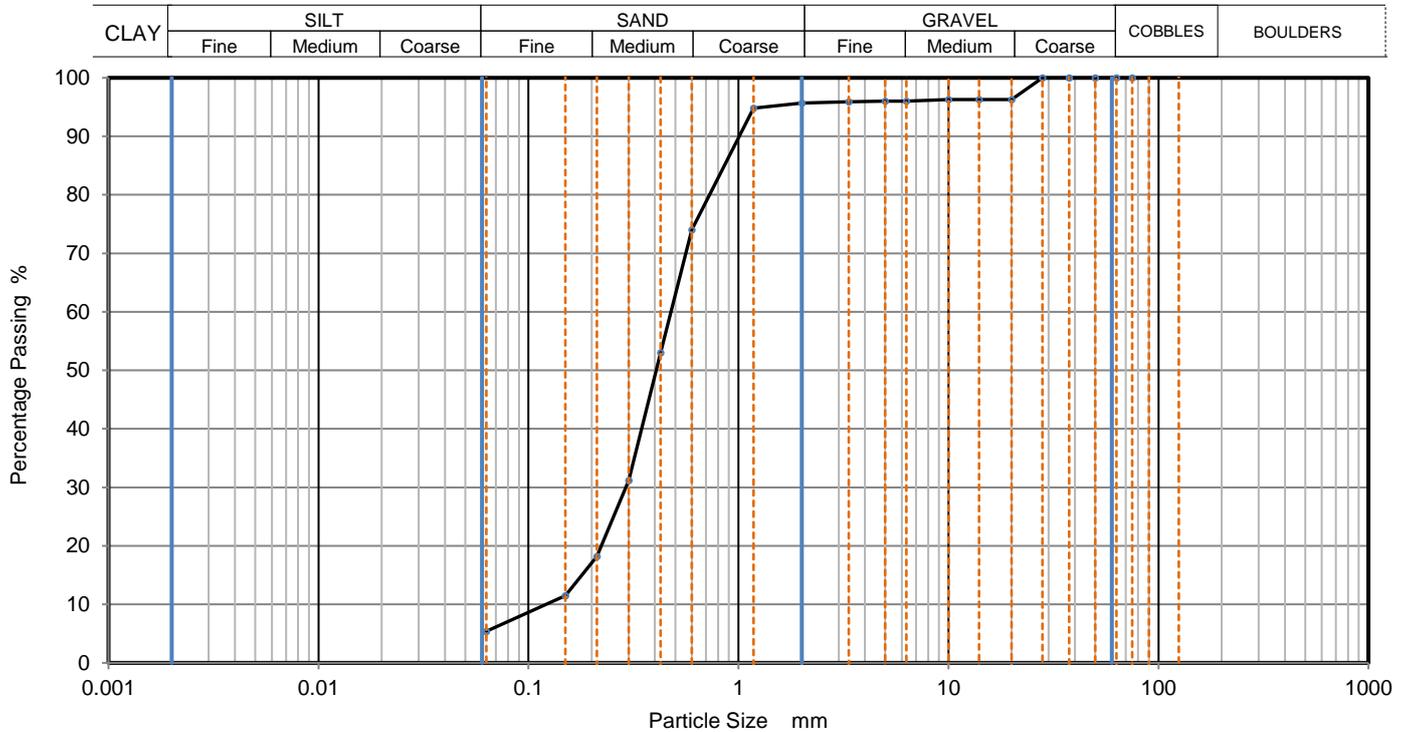
Grading Analysis		
D100	mm	
D60	mm	5.01
D30	mm	0.115
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH009	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Core: Light grey slightly gravelly silty medium SAND.		Depth, m	5.40	
Specimen Reference		Specimen Depth	5.5-5.7 m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220221283	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	96		
10	96		
6.3	96		
5	96		
3.35	96		
2	96		
1.18	95		
0.6	74		
0.425	53		
0.3	31		
0.212	18		
0.15	12		
0.063	5		

Dry Mass of sample, g 802

Sample Proportions	% dry mass
Very coarse	0
Gravel	4
Sand	90
Fines <0.063mm	5

Grading Analysis		
D100	mm	
D60	mm	0.477
D30	mm	0.291
D10	mm	0.121
Uniformity Coefficient		3.9
Curvature Coefficient		1.5

Remarks
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PARTICLE SIZE DISTRIBUTION

Job Ref **2021OY102**

Borehole/Pit No. **BPS-BH009**

Site Name **WSP Eastern & Midlands Region**

Sample No.

Soil Description **Core: Yellow slightly sandy SILT.**

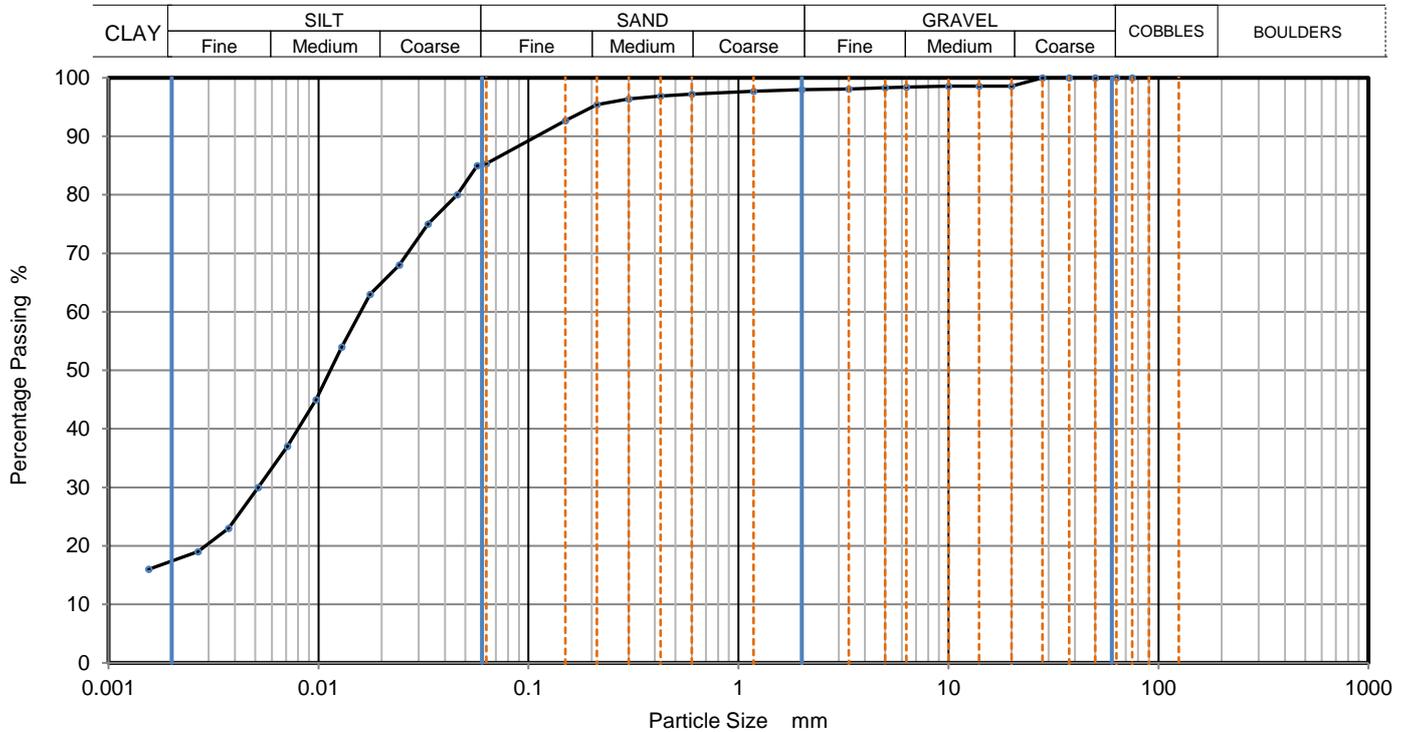
Depth, m **11.40**

Specimen Reference **13.35-13.55 m**

Sample Type **C**

Test Method **BS1377:Part 2:1990, clauses 9.2 and 9.5**

KeyLAB ID **IDL120220221289**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0570	85
		0.0459	80
75	100	0.0333	75
63	100	0.0243	68
50	100	0.0176	63
37.5	100	0.0129	54
28	100	0.0097	45
20	99	0.0071	37
14	99	0.0052	30
10	99	0.0037	23
6.3	98	0.0027	19
5	98	0.0016	16
3.35	98		
2	98		
1.18	98		
0.6	97	Particle density (assumed)	
0.425	97	2.65	Mg/m3
0.3	96		
0.212	95		
0.15	93		
0.063	85		

Dry Mass of sample, g

829

Sample Proportions	% dry mass
Very coarse	0
Gravel	2
Sand	13
Silt	68
Clay	17

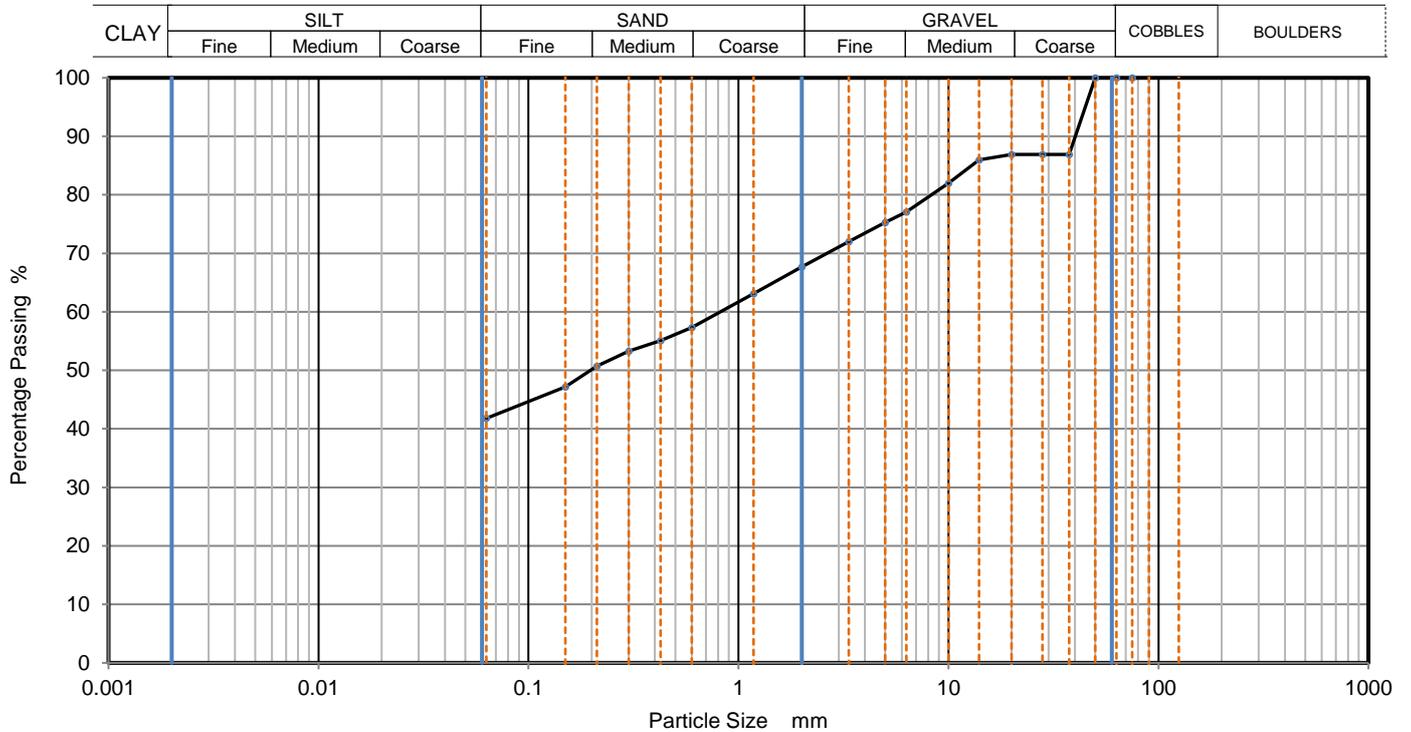
Grading Analysis		
D100	mm	
D60	mm	0.016
D30	mm	0.00525
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH010	
Site Name	WSP Eastern & Midlands Region		Sample No.	16	
Soil Description	Light brown slightly sandy slightly gravelly SILT.		Depth, m	5.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220201273	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	87		
28	87		
20	87		
14	86		
10	82		
6.3	77		
5	75		
3.35	72		
2	68		
1.18	63		
0.6	57		
0.425	55		
0.3	53		
0.212	51		
0.15	47		
0.063	42		

Dry Mass of sample, g 868

Sample Proportions	% dry mass
Very coarse	0
Gravel	32
Sand	26
Fines <0.063mm	42

Grading Analysis		
D100	mm	
D60	mm	0.821
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

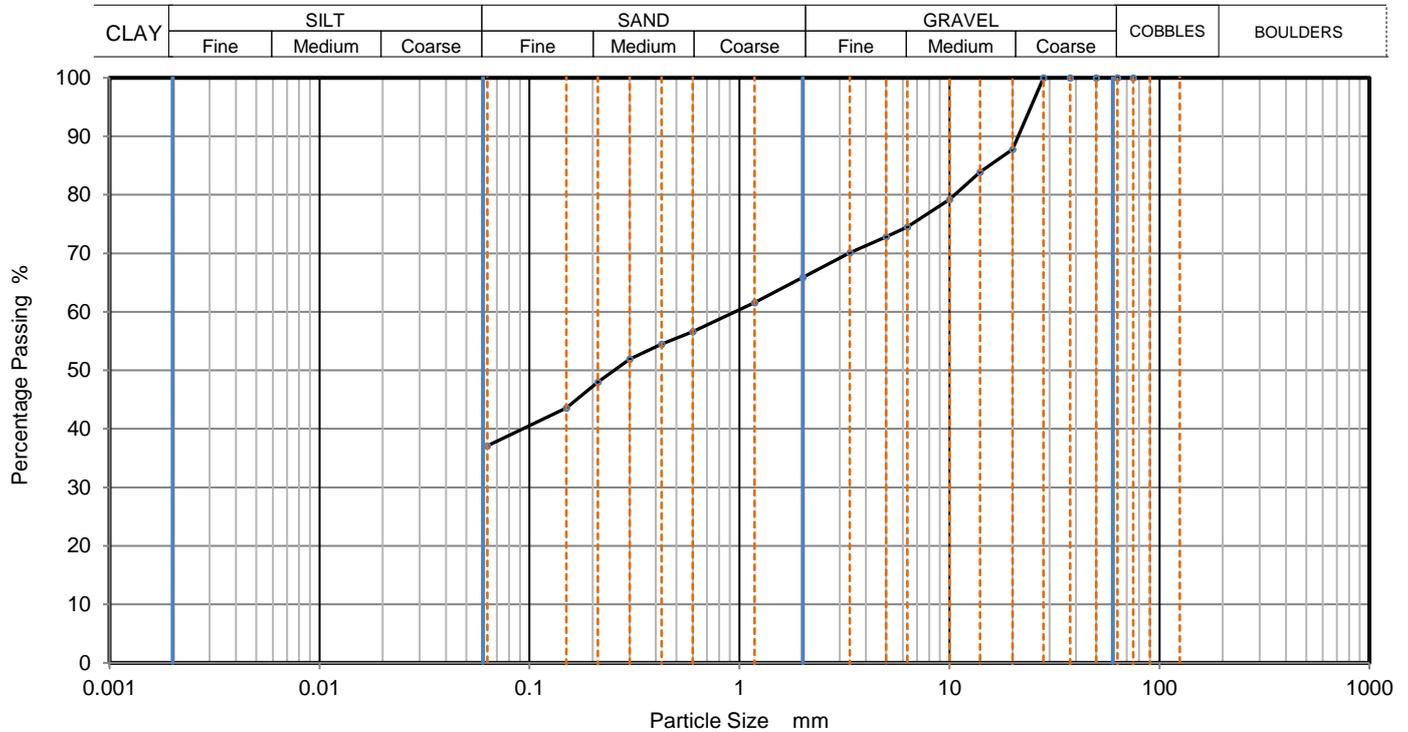
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH010
Sample No.	19
Depth, m	6.00
Sample Type	B
KeyLAB ID	IDL120220201276

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown slightly sandy gravelly SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	88		
14	84		
10	79		
6.3	75		
5	73		
3.35	70		
2	66		
1.18	62		
0.6	57		
0.425	55		
0.3	52		
0.212	48		
0.15	44		
0.063	37		

Dry Mass of sample, g 827

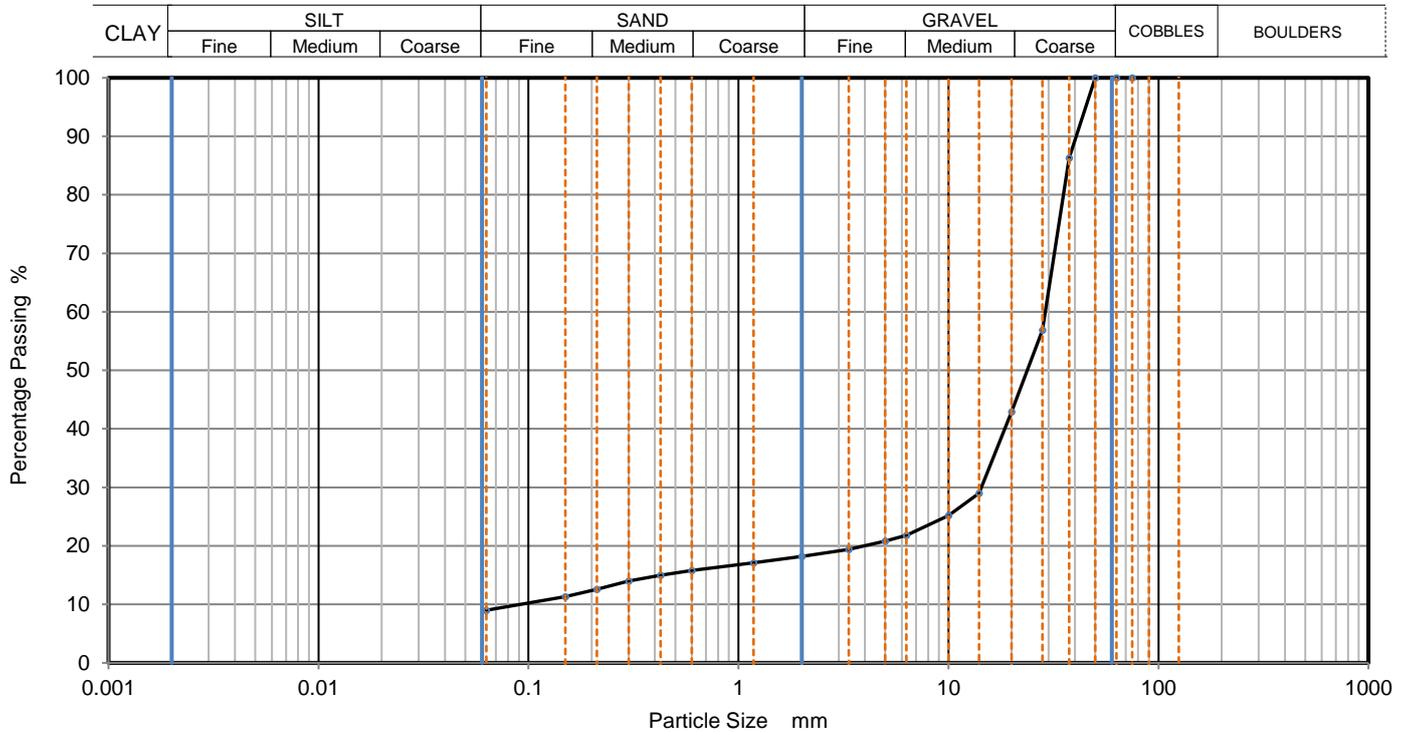
Sample Proportions	% dry mass
Very coarse	0
Gravel	34
Sand	29
Fines <0.063mm	37

Grading Analysis	
D100	mm
D60	mm 0.945
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH011	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Core: Cream silty sandy coarse GRAVEL.		Depth, m	2.50	
Specimen Reference		Specimen Depth	m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220406170	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	86		
28	57		
20	43		
14	29		
10	25		
6.3	22		
5	21		
3.35	19		
2	18		
1.18	17		
0.6	16		
0.425	15		
0.3	14		
0.212	13		
0.15	11		
0.063	9		

Dry Mass of sample, g 1274

Sample Proportions	% dry mass
Very coarse	0
Gravel	82
Sand	9
Fines <0.063mm	9

Grading Analysis		
D100	mm	
D60	mm	28.9
D30	mm	14.4
D10	mm	0.091
Uniformity Coefficient		320
Curvature Coefficient		78

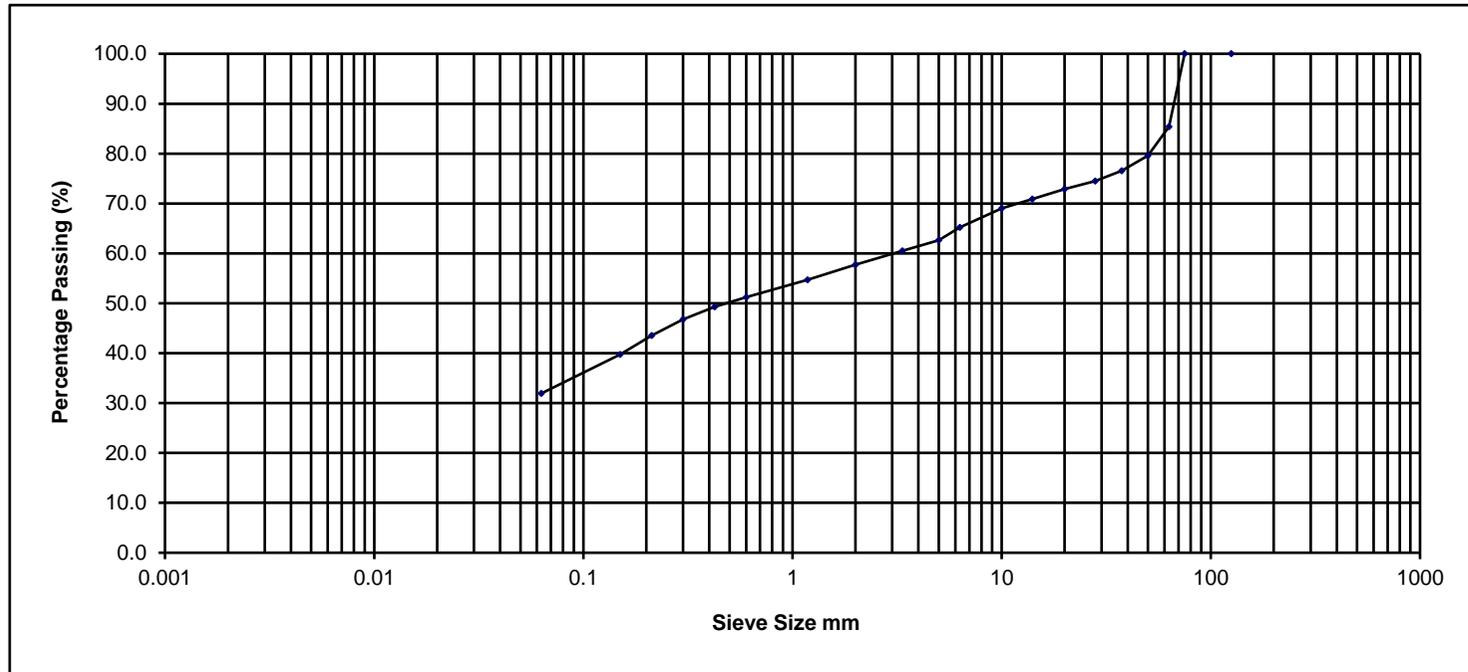
Remarks
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Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	85.4
50.000	79.6
37.500	76.5
28.000	74.5
20.000	72.9
14.000	70.9
10.000	69.0
6.300	65.2
5.000	62.7
3.350	60.5
2.000	57.7
1.180	54.7
0.600	51.2
0.425	49.3
0.300	46.8
0.212	43.5
0.150	39.8
0.063	31.9

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	31.9			25.8			27.7			14.6	0.0

Sample Description Light brown slightly sandy slightly gravelly clayey SILT.

Project No. NMTL 3550

BH/TP No. BPS-BH011

Project WSP Eastern and Midlands Region

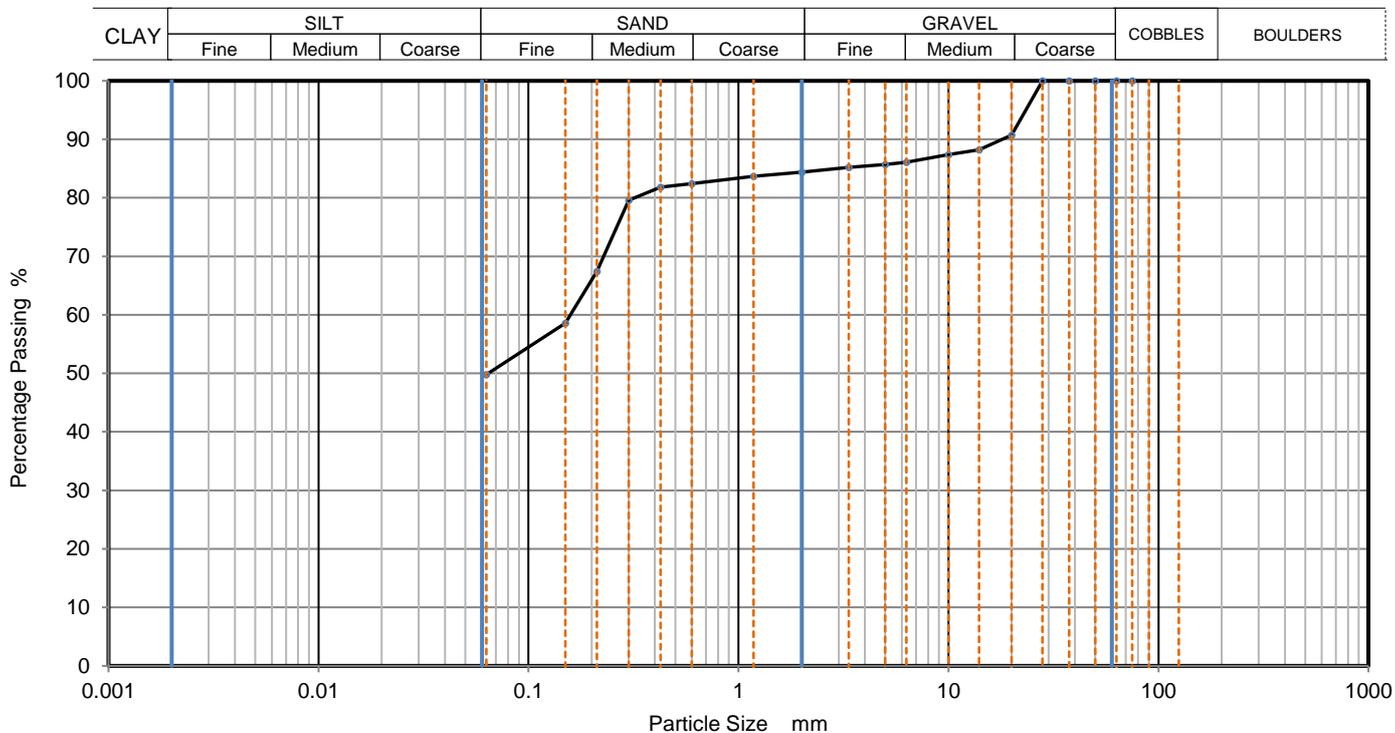
IDL PROJECT ID:2021OY102

Sample No. C

NM
TL
Ltd

Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	19/07/2022	Depth	8.50-10.00m
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH011	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Core: Cream slightly gravelly sandy SILT. Sand is fine and medium.		Depth, m	11.50	
Specimen Reference		Specimen Depth	m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220406182	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	91		
14	88		
10	87		
6.3	86		
5	86		
3.35	85		
2	84		
1.18	84		
0.6	82		
0.425	82		
0.3	80		
0.212	67		
0.15	59		
0.063	50		

Dry Mass of sample, g

1143

Sample Proportions	% dry mass
Very coarse	0
Gravel	16
Sand	35
Fines <0.063mm	50

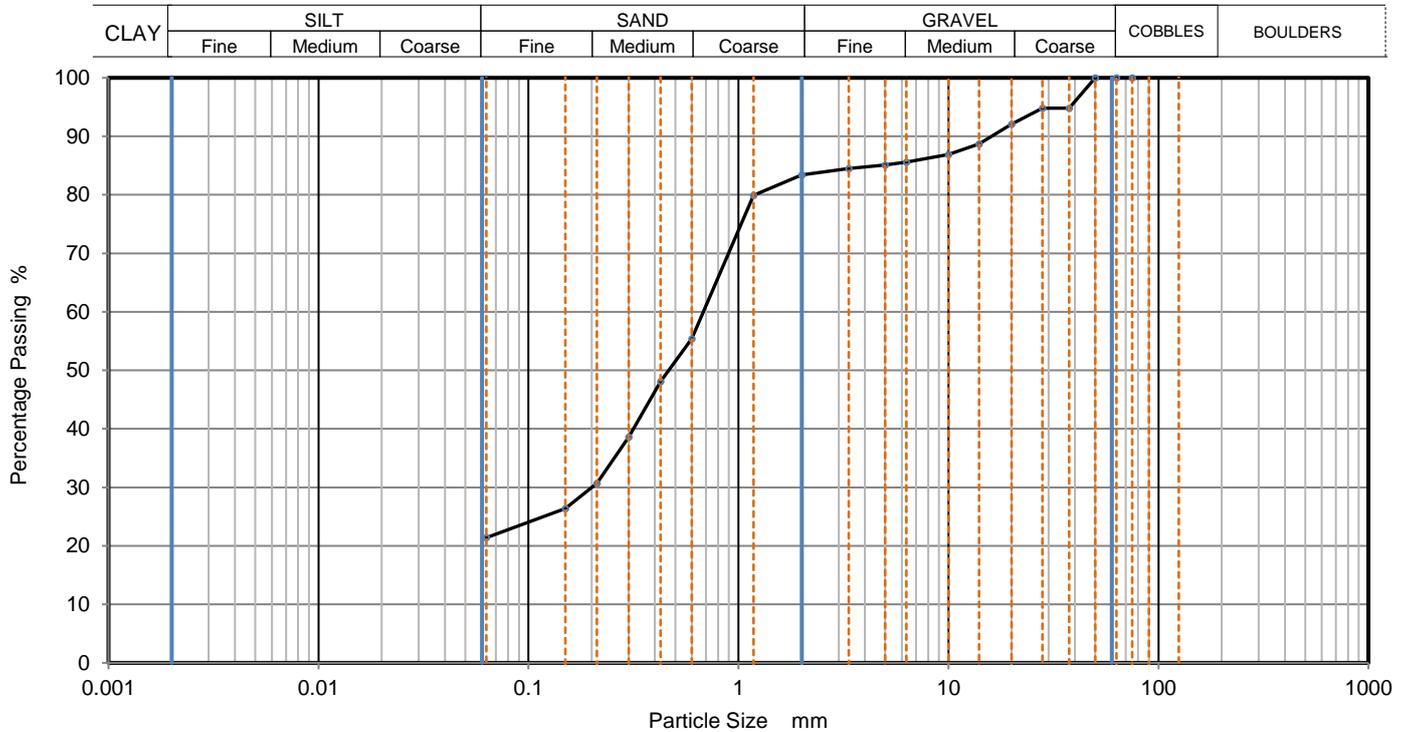
Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH011	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Cream gravelly very silty medium and coarse SAND.		Depth, m	14.50	
Specimen Reference		Specimen Depth	m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL120220406185	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	95		
28	95		
20	92		
14	89		
10	87		
6.3	86		
5	85		
3.35	85		
2	83		
1.18	80		
0.6	55		
0.425	48		
0.3	39		
0.212	31		
0.15	26		
0.063	21		

Dry Mass of sample, g 1064

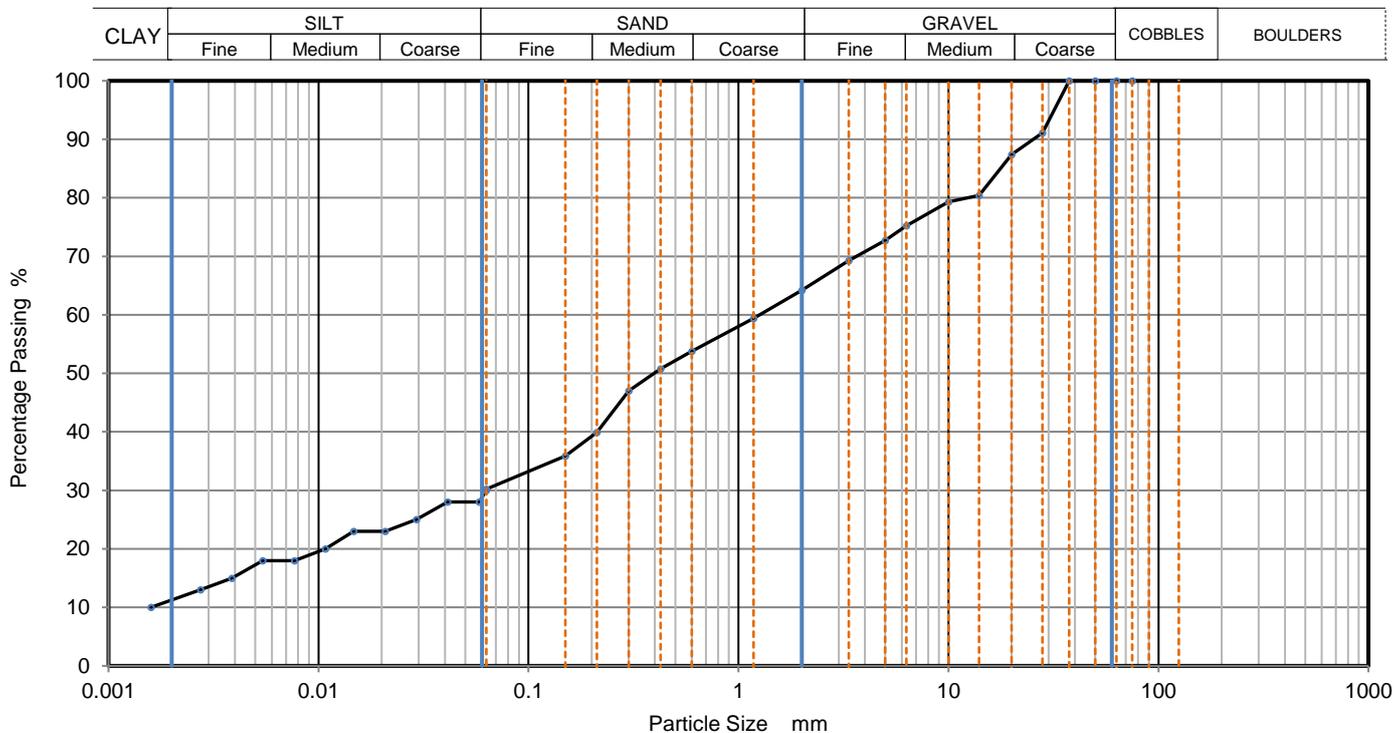
Sample Proportions	% dry mass
Very coarse	0
Gravel	17
Sand	62
Fines <0.063mm	21

Grading Analysis		
D100	mm	
D60	mm	0.681
D30	mm	0.2
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH012	
Site Name	WSP Eastern & Midlands Region		Sample No.	4	
Soil Description	Light brown very silty SAND and GRAVEL.		Depth, m	1.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12022020320	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	30
		0.0582	28
75	100	0.0411	28
63	100	0.0292	25
50	100	0.0208	23
37.5	100	0.0147	23
28	91	0.0108	20
20	87	0.0077	18
14	80	0.0054	18
10	79	0.0039	15
6.3	75	0.0027	13
5	73	0.0016	10
3.35	69		
2	64		
1.18	59		
0.6	54	Particle density (assumed)	
0.425	51	2.65	Mg/m ³
0.3	47		
0.212	40		
0.15	36		
0.063	30		

Dry Mass of sample, g

881

Sample Proportions	% dry mass
Very coarse	0
Gravel	36
Sand	34
Silt	19
Clay	11

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

Remarks

Preparation and testing in accordance with BS1377 unless noted below

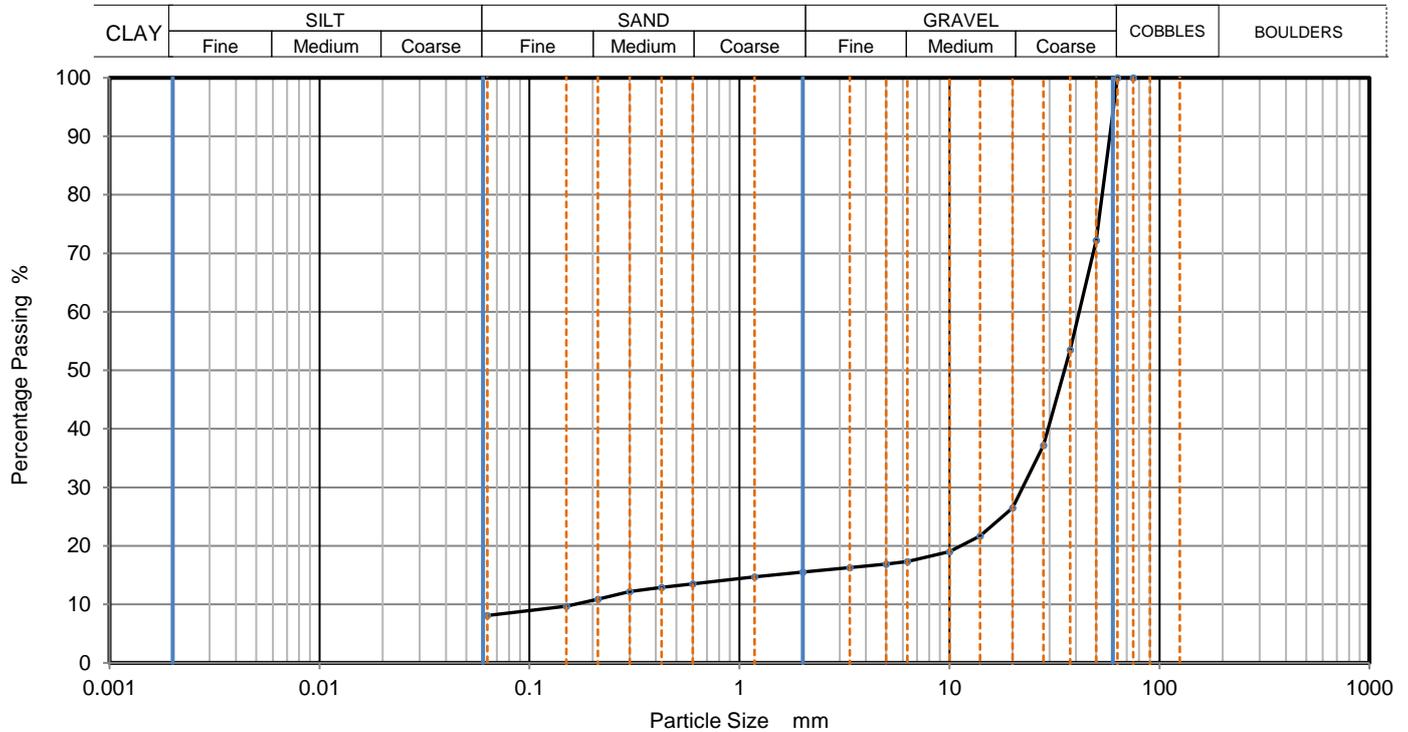
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH012
Sample No.	
Depth, m	4.50
Sample Type	C
KeyLAB ID	IDL120220615214

Site Name	WSP Eastern & Midlands Region	
Soil Description	Core: Light grey sandy silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	72		
37.5	54		
28	37		
20	27		
14	22		
10	19		
6.3	17		
5	17		
3.35	16		
2	16		
1.18	15		
0.6	14		
0.425	13		
0.3	12		
0.212	11		
0.15	10		
0.063	8		

Dry Mass of sample, g 1317

Sample Proportions	% dry mass
Very coarse	0
Gravel	85
Sand	7
Fines <0.063mm	8

Grading Analysis		
D100	mm	
D60	mm	41.5
D30	mm	22.3
D10	mm	0.162
Uniformity Coefficient		260
Curvature Coefficient		74

Remarks
Preparation and testing in accordance with BS1377 unless noted below

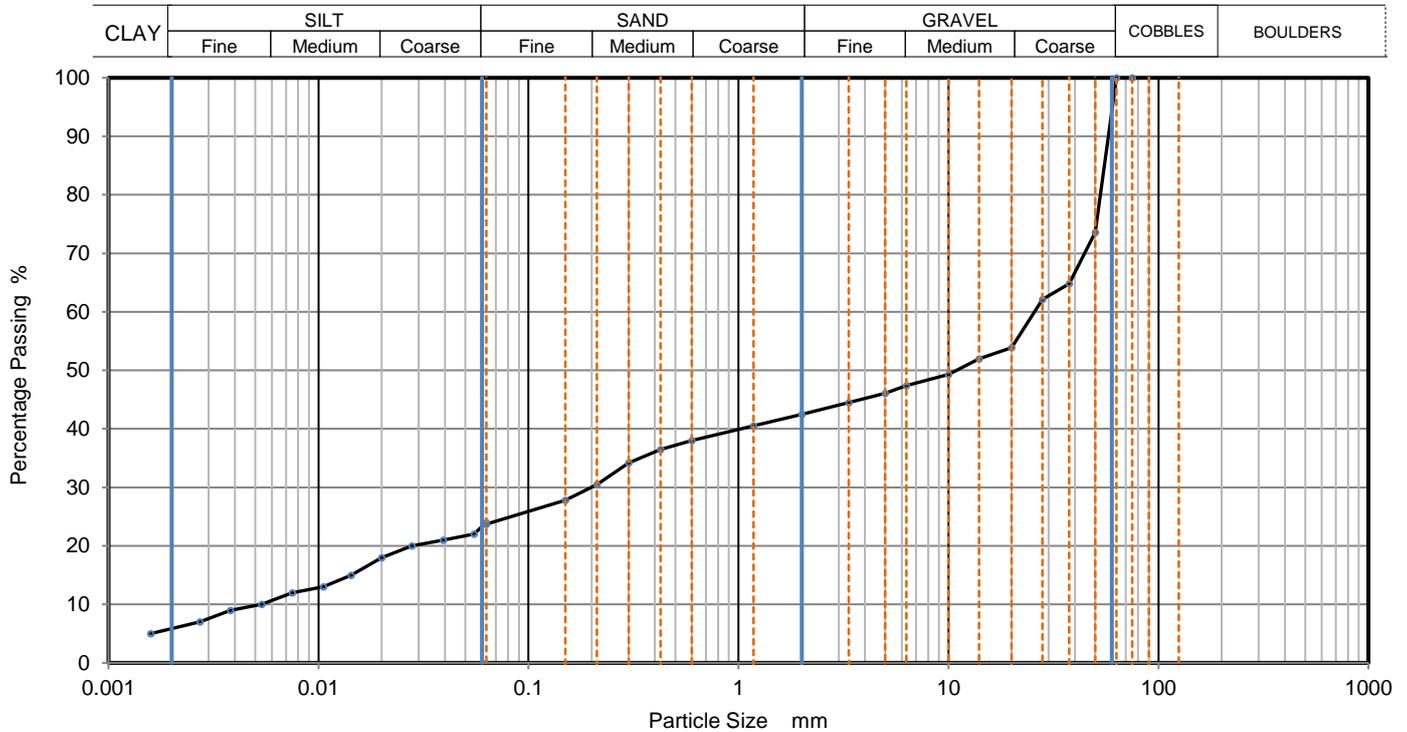
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH012
Sample No.	16
Depth, m	5.00
Sample Type	B
KeyLAB ID	IDL12022020332

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brownish-grey sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	24
		0.0551	22
75	100	0.0392	21
63	100	0.0279	20
50	74	0.0200	18
37.5	65	0.0143	15
28	62	0.0105	13
20	54	0.0075	12
14	52	0.0054	10
10	49	0.0038	9
6.3	47	0.0027	7
5	46	0.0016	5
3.35	45		
2	43		
1.18	41		
0.6	38	Particle density (assumed) 2.65 Mg/m ³	
0.425	37		
0.3	34		
0.212	31		
0.15	28		
0.063	24		

Dry Mass of sample, g 1403

Sample Proportions	% dry mass
Very coarse	0
Gravel	58
Sand	19
Silt	18
Clay	6

Grading Analysis		
D100	mm	
D60	mm	25.6
D30	mm	0.198
D10	mm	0.00485
Uniformity Coefficient		5300
Curvature Coefficient		0.32

Remarks
Preparation and testing in accordance with BS1377 unless noted below

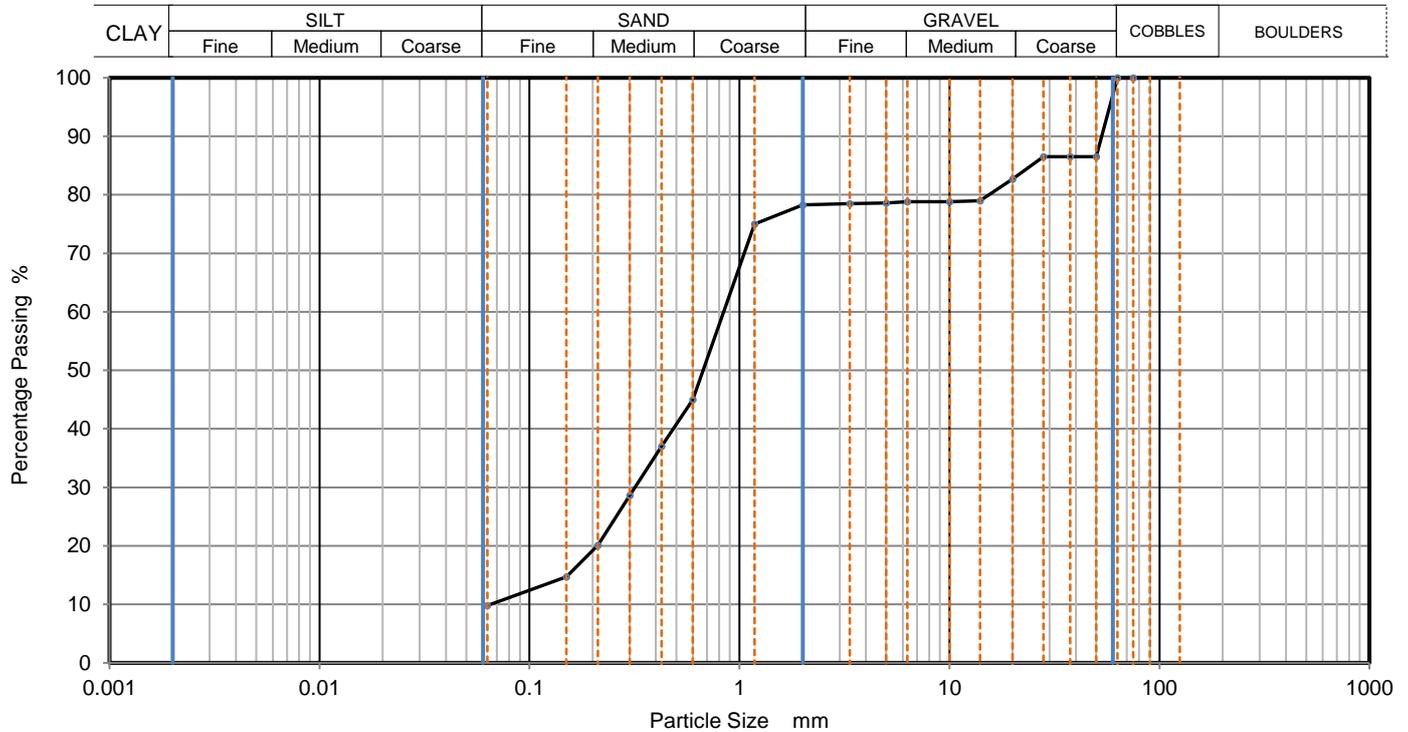
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH012
Sample No.	
Depth, m	8.00
Sample Type	C
KeyLAB ID	IDL12022040638

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light grey silty very gravelly coarse and medium SAND.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	87		
37.5	87		
28	87		
20	83		
14	79		
10	79		
6.3	79		
5	79		
3.35	79		
2	78		
1.18	75		
0.6	45		
0.425	37		
0.3	29		
0.212	20		
0.15	15		
0.063	10		

Dry Mass of sample, g 828

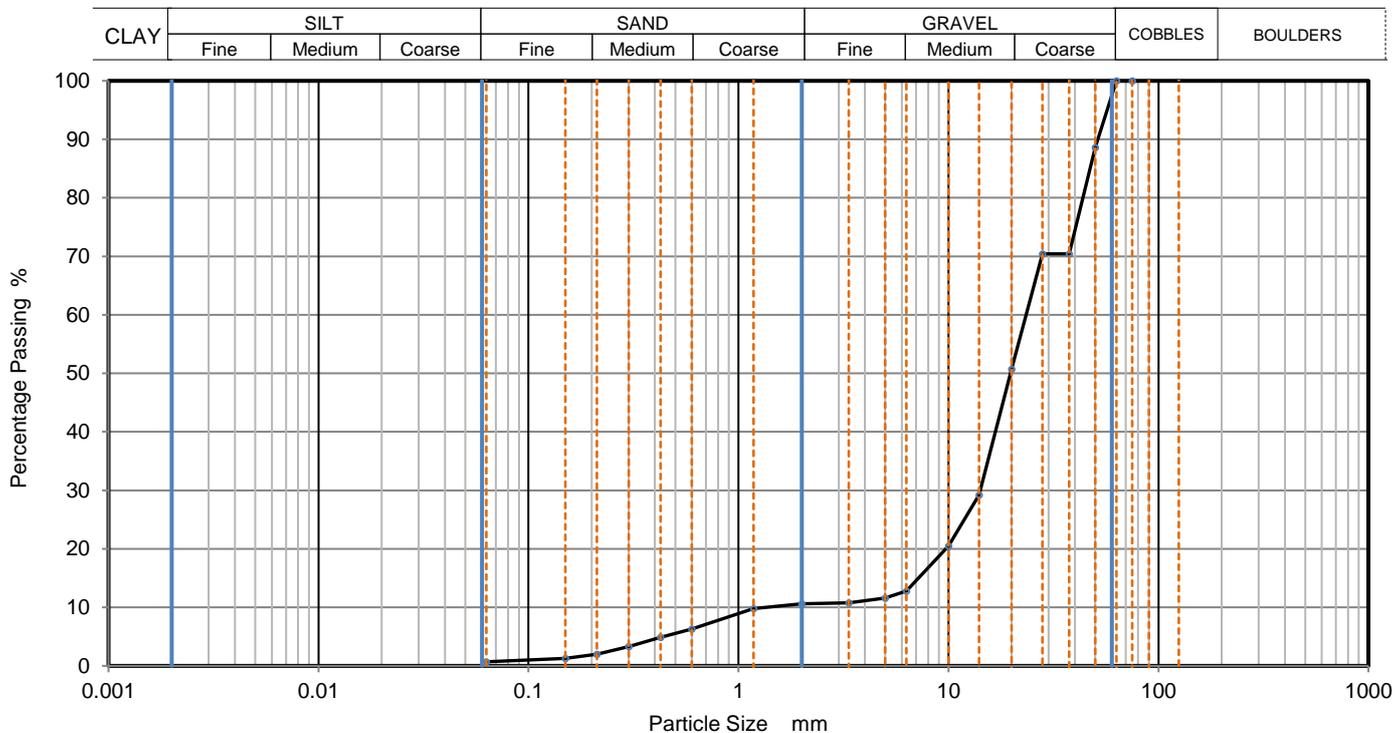
Sample Proportions	% dry mass
Very coarse	0
Gravel	22
Sand	68
Fines <0.063mm	10

Grading Analysis		
D100	mm	
D60	mm	0.842
D30	mm	0.318
D10	mm	0.0648
Uniformity Coefficient		13
Curvature Coefficient		1.9

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-BH012	
Site Name	WSP Eastern & Midlands Region		Sample No.		
Soil Description	Core: Light grey slightly silty sandy medium and coarse GRAVEL.		Depth, m	9.50	
Specimen Reference		Specimen Depth	m	Sample Type	C
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL12022040640	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	89		
37.5	70		
28	70		
20	51		
14	29		
10	21		
6.3	13		
5	12		
3.35	11		
2	11		
1.18	10		
0.6	6		
0.425	5		
0.3	3		
0.212	2		
0.15	1		
0.063	1		

Dry Mass of sample, g

982

Sample Proportions	% dry mass
Very coarse	0
Gravel	89
Sand	10
Fines <0.063mm	1

Grading Analysis		
D100	mm	
D60	mm	23.5
D30	mm	14.2
D10	mm	1.37
Uniformity Coefficient		17
Curvature Coefficient		6.3

Remarks

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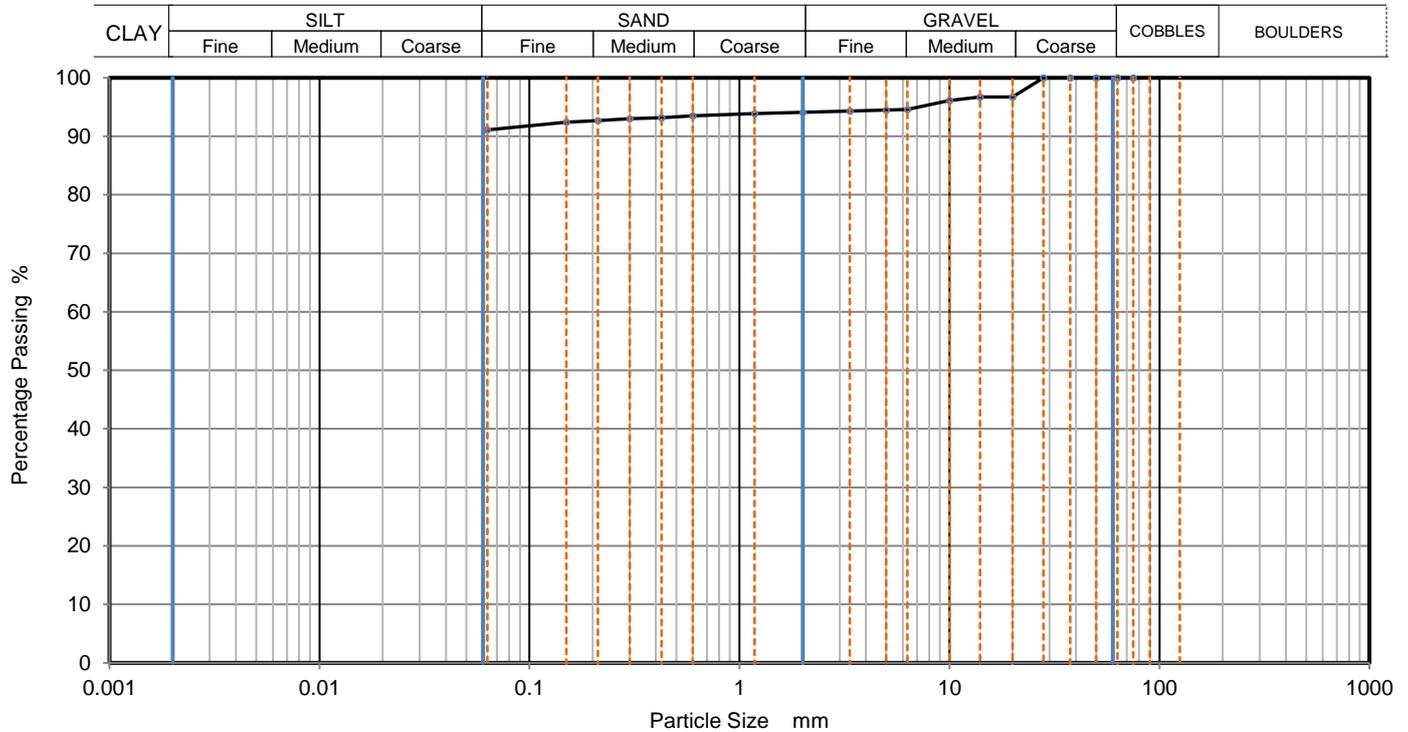
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-BH012
Sample No.	
Depth, m	17.00
Sample Type	C
KeyLAB ID	IDL12022040648

Site Name	WSP Eastern & Midlands Region	
Soil Description	Core: Cream slightly sandy slightly gravelly SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	97		
10	96		
6.3	95		
5	95		
3.35	94		
2	94		
1.18	94		
0.6	94		
0.425	93		
0.3	93		
0.212	93		
0.15	92		
0.063	91		

Dry Mass of sample, g 1018

Sample Proportions	% dry mass
Very coarse	0
Gravel	6
Sand	3
Fines <0.063mm	91

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

Remarks
Preparation and testing in accordance with BS1377 unless noted below

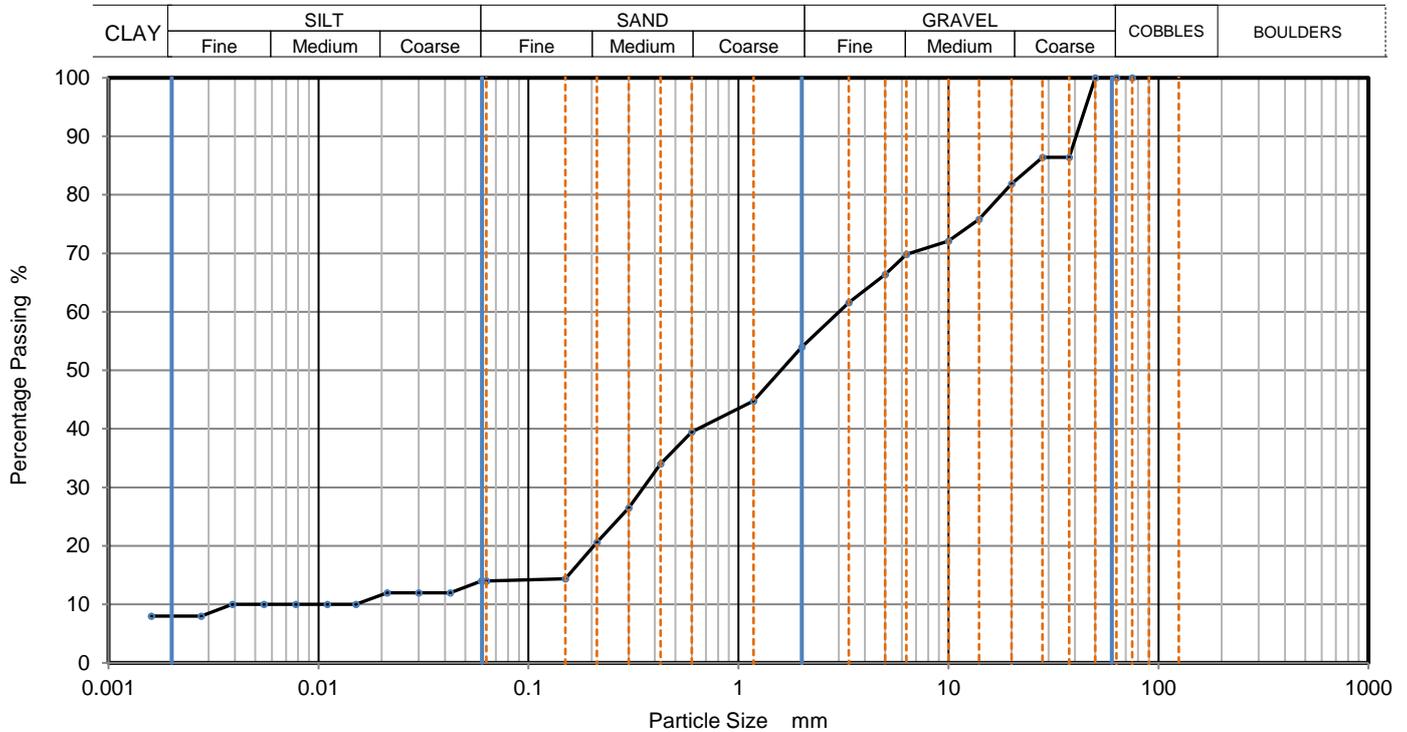
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP001
Sample No.	1
Depth, m	0.40
Sample Type	B
KeyLAB ID	IDL1202112070

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown silty SAND and GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	14
		0.0597	14
75	100	0.0424	12
63	100	0.0300	12
50	100	0.0212	12
37.5	86	0.0151	10
28	86	0.0110	10
20	82	0.0078	10
14	76	0.0055	10
10	72	0.0039	10
6.3	70	0.0028	8
5	66	0.0016	8
3.35	62		
2	54		
1.18	45		
0.6	40	Particle density (assumed)	
0.425	34	2.65	Mg/m3
0.3	27		
0.212	21		
0.15	14		
0.063	14		

Dry Mass of sample, g 882

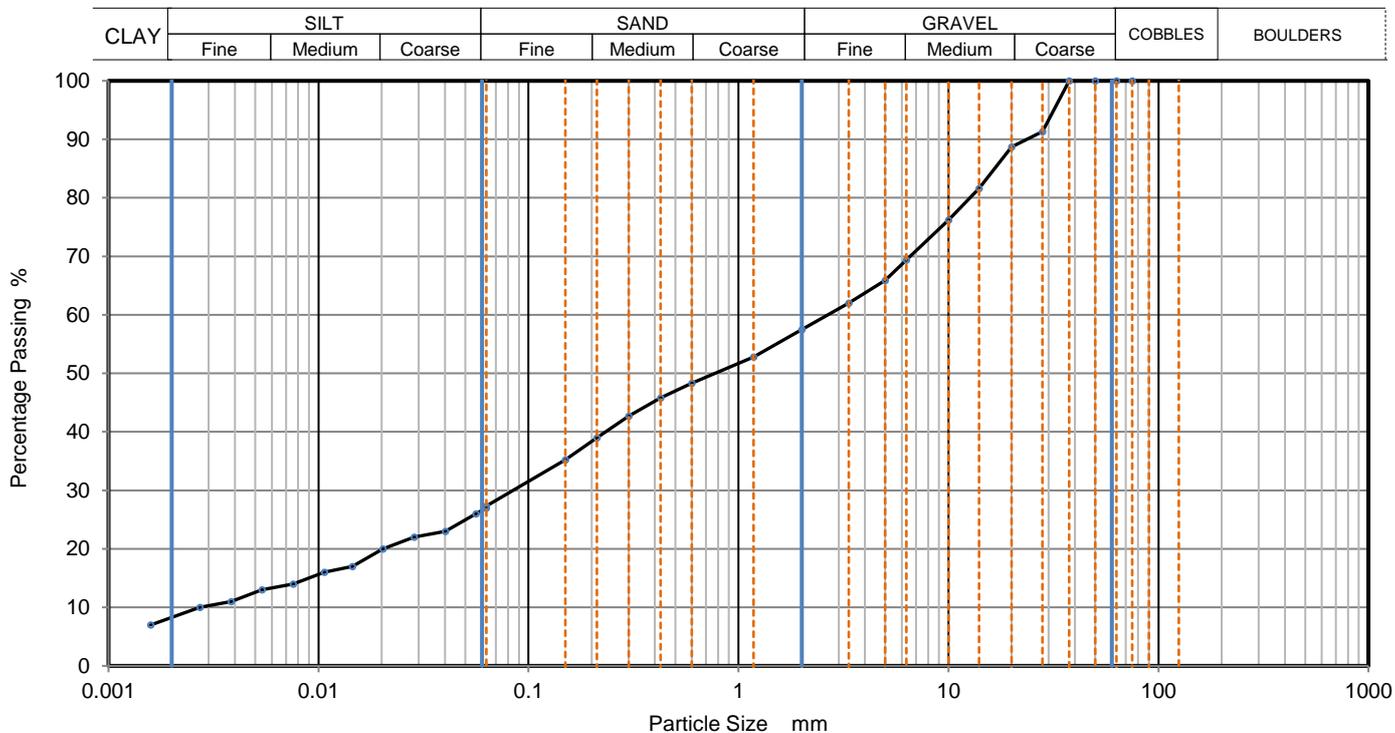
Sample Proportions	% dry mass
Very coarse	0
Gravel	46
Sand	40
Silt	6
Clay	8

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

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP001	
Site Name	WSP Eastern & Midlands Region		Sample No.	3	
Soil Description	Light brown very silty very sandy GRAVEL.		Depth, m	0.90	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL1202112072	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	27
		0.0561	26
75	100	0.0401	23
63	100	0.0285	22
50	100	0.0203	20
37.5	100	0.0145	17
28	91	0.0107	16
20	89	0.0076	14
14	82	0.0054	13
10	76	0.0038	11
6.3	69	0.0027	10
5	66	0.0016	7
3.35	62		
2	58		
1.18	53		
0.6	48	Particle density (assumed)	
0.425	46	2.65	Mg/m3
0.3	43		
0.212	39		
0.15	35		
0.063	27		

Dry Mass of sample, g

779

Sample Proportions	% dry mass
Very coarse	0
Gravel	43
Sand	30
Silt	19
Clay	8

Grading Analysis		
D100	mm	
D60	mm	2.67
D30	mm	0.0846
D10	mm	0.00269
Uniformity Coefficient		990
Curvature Coefficient		1

Remarks

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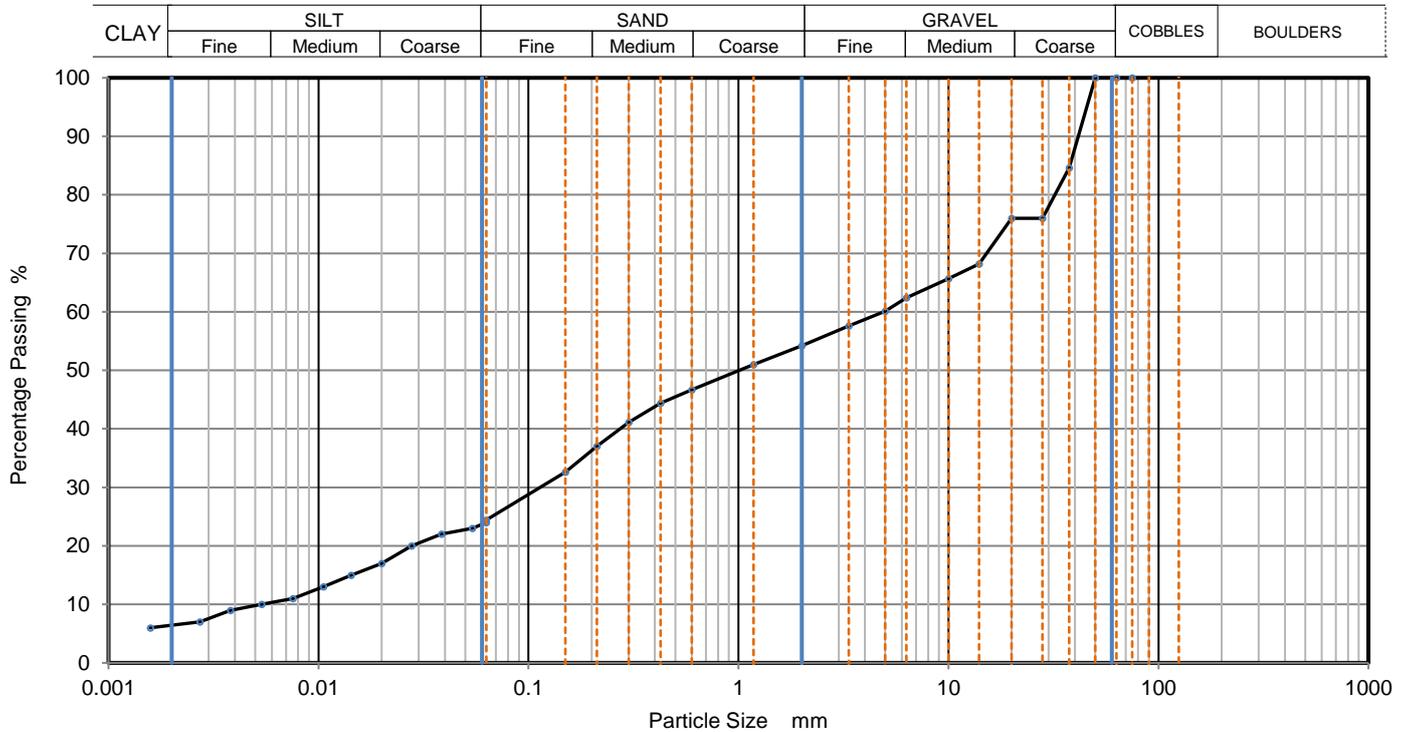
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP001
Sample No.	5
Depth, m	2.00
Sample Type	B
KeyLAB ID	IDL1202112074

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown very silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	24
		0.0541	23
75	100	0.0385	22
63	100	0.0277	20
50	100	0.0200	17
37.5	85	0.0143	15
28	76	0.0105	13
20	76	0.0075	11
14	68	0.0054	10
10	66	0.0038	9
6.3	62	0.0027	7
5	60	0.0016	6
3.35	58		
2	54		
1.18	51		
0.6	47	Particle density (assumed) 2.65 Mg/m ³	
0.425	44		
0.3	41		
0.212	37		
0.15	33		
0.063	24		

Dry Mass of sample, g 905

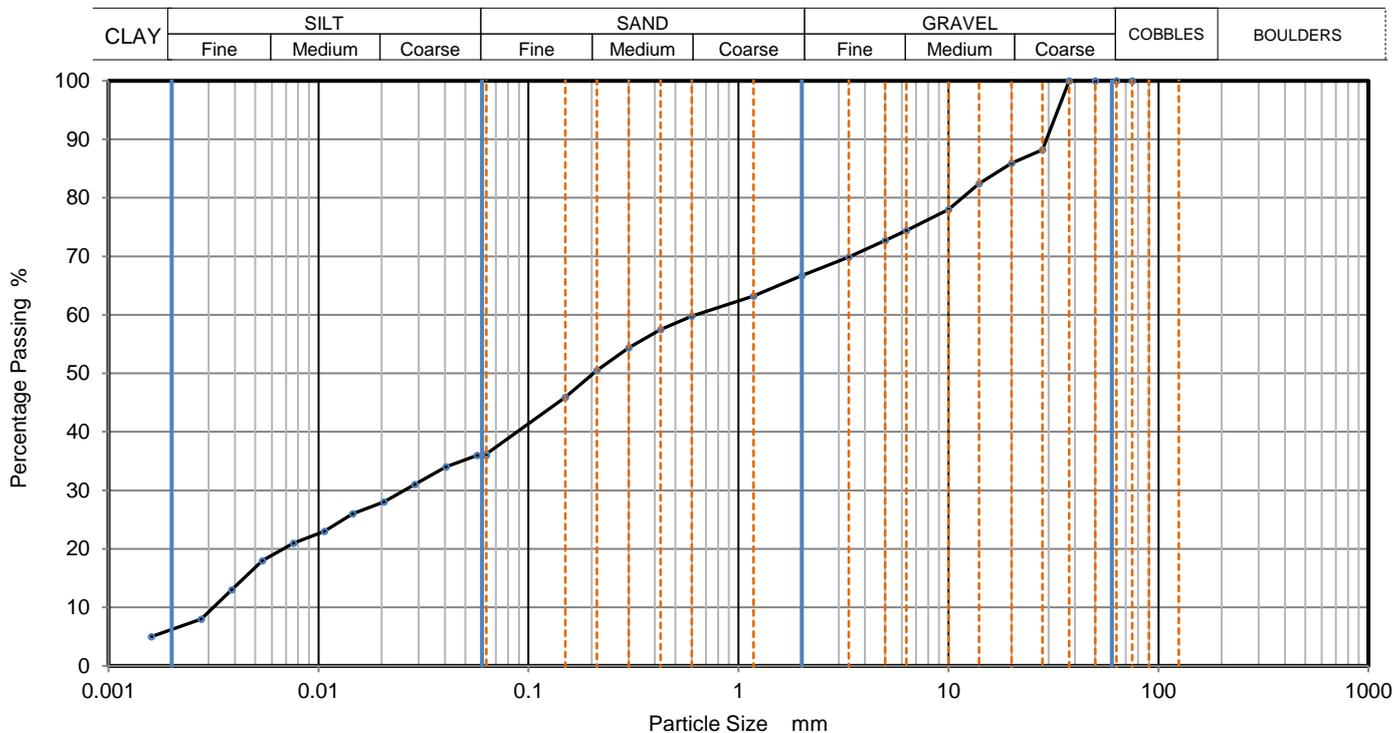
Sample Proportions	% dry mass
Very coarse	0
Gravel	46
Sand	30
Silt	18
Clay	6

Grading Analysis		
D100	mm	
D60	mm	4.95
D30	mm	0.114
D10	mm	0.00583
Uniformity Coefficient		850
Curvature Coefficient		0.45

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP001	
Site Name	WSP Eastern & Midlands Region		Sample No.	7	
Soil Description	Brown slightly sandy slightly gravelly SILT.		Depth, m	3.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL1202112076	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	36
		0.0569	36
75	100	0.0405	34
63	100	0.0288	31
50	100	0.0205	28
37.5	100	0.0146	26
28	88	0.0107	23
20	86	0.0076	21
14	82	0.0054	18
10	78	0.0039	13
6.3	74	0.0028	8
5	73	0.0016	5
3.35	70		
2	67		
1.18	63		
0.6	60	Particle density (assumed)	
0.425	58	2.65	Mg/m ³
0.3	54		
0.212	51		
0.15	46		
0.063	36		

Dry Mass of sample, g

941

Sample Proportions	% dry mass
Very coarse	0
Gravel	33
Sand	31
Silt	30
Clay	6

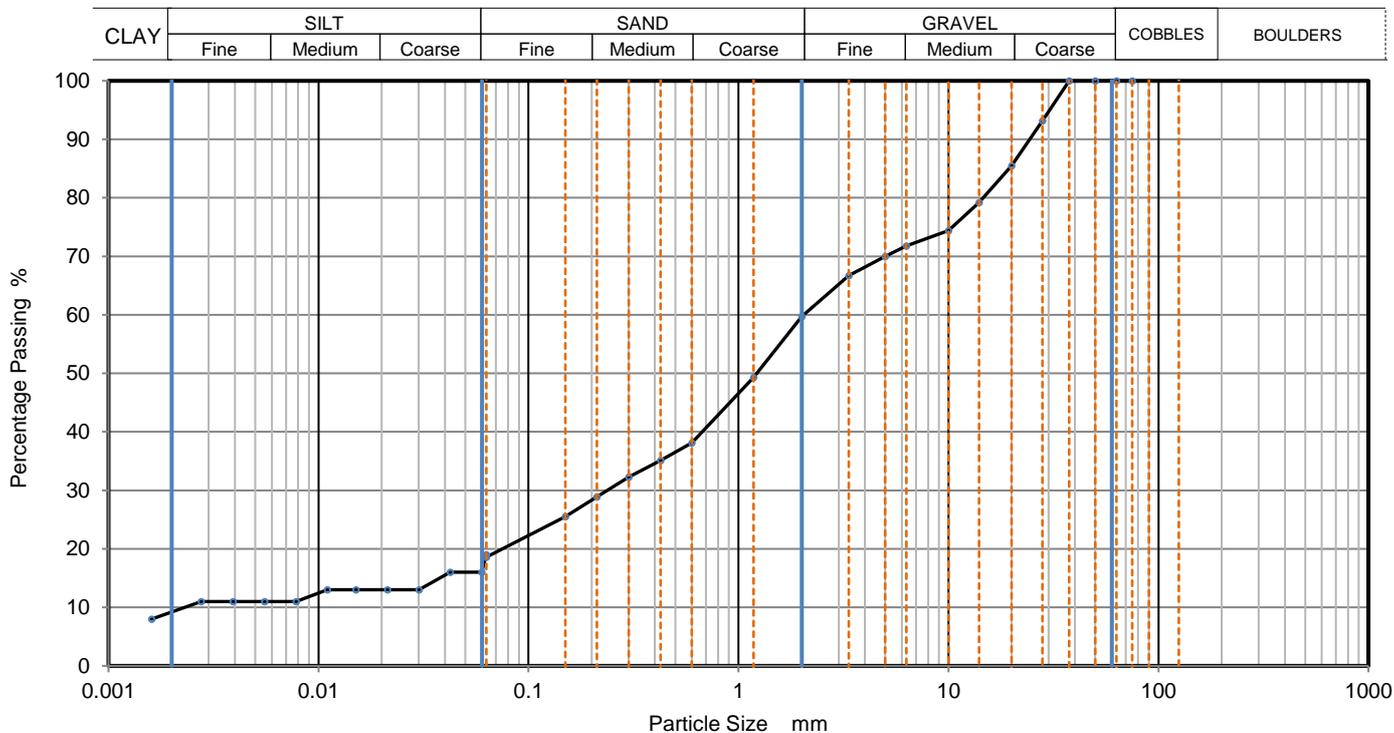
Grading Analysis		
D100	mm	
D60	mm	0.623
D30	mm	0.0251
D10	mm	0.00319
Uniformity Coefficient		200
Curvature Coefficient		0.32

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP002	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Grey-brown silty SAND and GRAVEL.		Depth, m	0.40	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL1202112078	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	19
		0.0600	16
75	100	0.0424	16
63	100	0.0301	13
50	100	0.0213	13
37.5	100	0.0151	13
28	93	0.0110	13
20	86	0.0078	11
14	79	0.0055	11
10	74	0.0039	11
6.3	72	0.0028	11
5	70	0.0016	8
3.35	67		
2	60		
1.18	49		
0.6	38	Particle density (assumed)	
0.425	35	2.65	Mg/m ³
0.3	32		
0.212	29		
0.15	26		
0.063	19		

Dry Mass of sample, g

901

Sample Proportions	% dry mass
Very coarse	0
Gravel	40
Sand	41
Silt	10
Clay	9

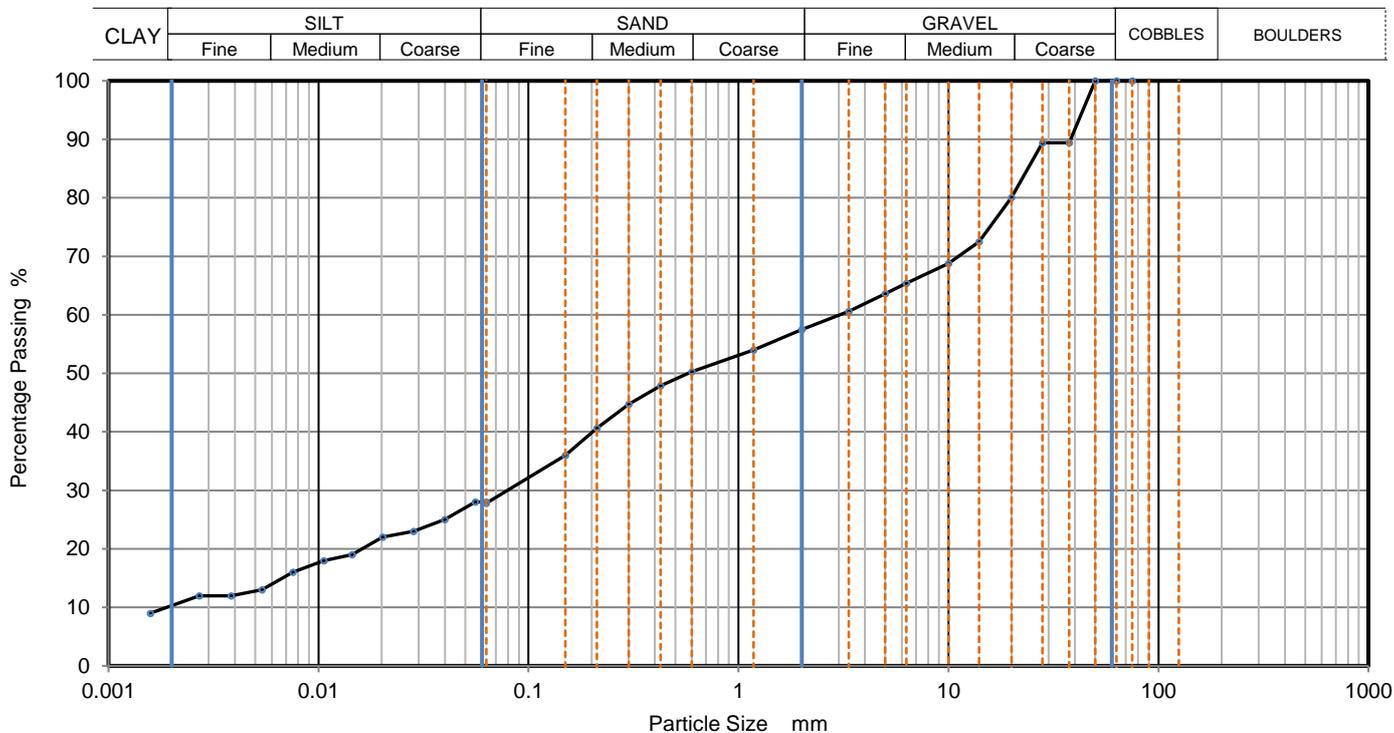
Grading Analysis		
D100	mm	
D60	mm	2.05
D30	mm	0.237
D10	mm	0.00243
Uniformity Coefficient		840
Curvature Coefficient		11

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP002	
Site Name	WSP Eastern & Midlands Region		Sample No.	3	
Soil Description	Brown very silty very sandy coarse GRAVEL.		Depth, m	1.50	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120710	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	28
		0.0558	28
75	100	0.0399	25
63	100	0.0284	23
50	100	0.0202	22
37.5	89	0.0144	19
28	89	0.0106	18
20	80	0.0075	16
14	73	0.0054	13
10	69	0.0038	12
6.3	65	0.0027	12
5	64	0.0016	9
3.35	61		
2	58		
1.18	54		
0.6	50	Particle density (assumed)	
0.425	48	2.65	Mg/m ³
0.3	45		
0.212	41		
0.15	36		
0.063	28		

Dry Mass of sample, g

973

Sample Proportions	% dry mass
Very coarse	0
Gravel	43
Sand	30
Silt	18
Clay	10

Grading Analysis		
D100	mm	
D60	mm	3.04
D30	mm	0.0795
D10	mm	0.00198
Uniformity Coefficient		1500
Curvature Coefficient		1.1

Remarks

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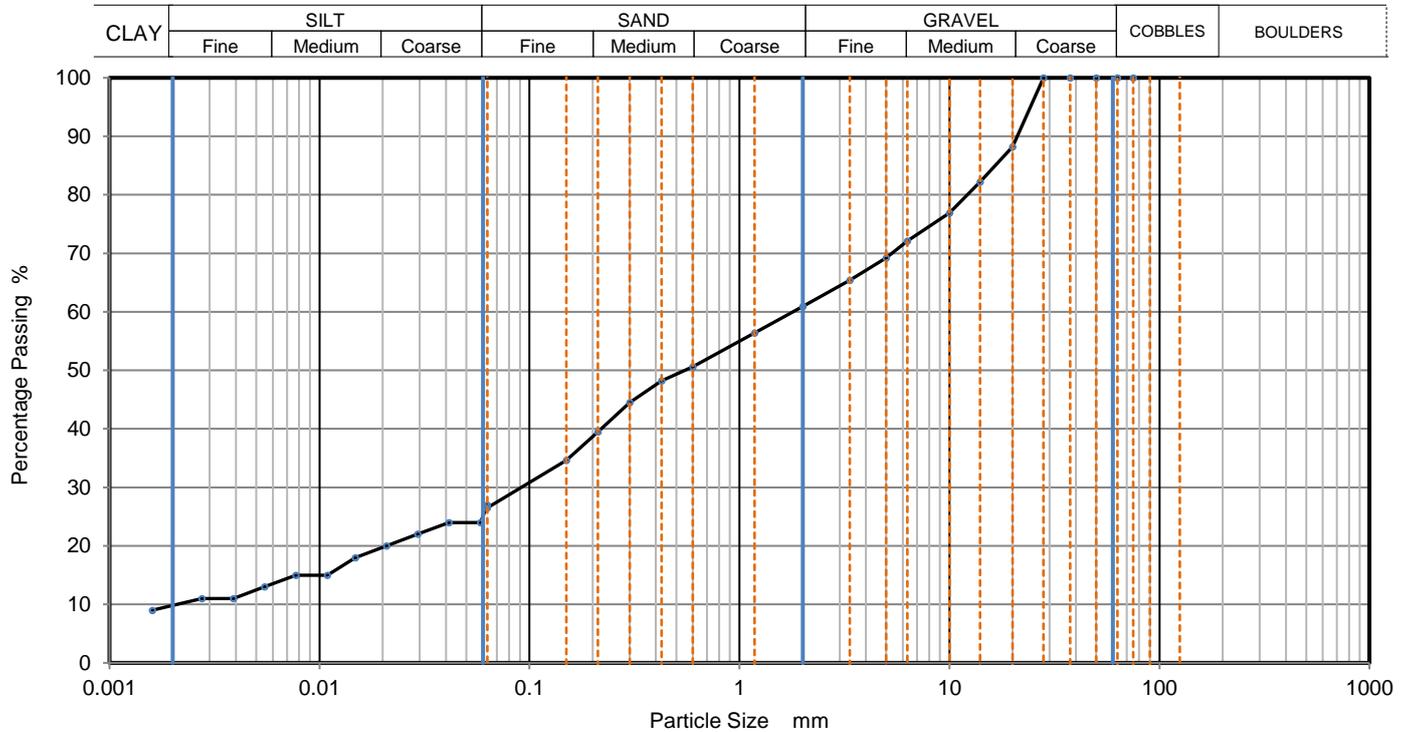
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP002
Sample No.	5
Depth, m	2.80
Sample Type	B
KeyLAB ID	IDL12021120712

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown very silty SAND and GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	27
		0.0584	24
75	100	0.0413	24
63	100	0.0294	22
50	100	0.0209	20
37.5	100	0.0148	18
28	100	0.0109	15
20	88	0.0077	15
14	82	0.0055	13
10	77	0.0039	11
6.3	72	0.0028	11
5	69	0.0016	9
3.35	65		
2	61		
1.18	56		
0.6	51	Particle density (assumed) 2.65 Mg/m ³	
0.425	48		
0.3	45		
0.212	40		
0.15	35		
0.063	27		

Dry Mass of sample, g 947

Sample Proportions	% dry mass
Very coarse	0
Gravel	39
Sand	34
Silt	17
Clay	10

Grading Analysis		
D100	mm	
D60	mm	1.8
D30	mm	0.0918
D10	mm	0.00213
Uniformity Coefficient		850
Curvature Coefficient		2.2

Remarks
Preparation and testing in accordance with BS1377 unless noted below

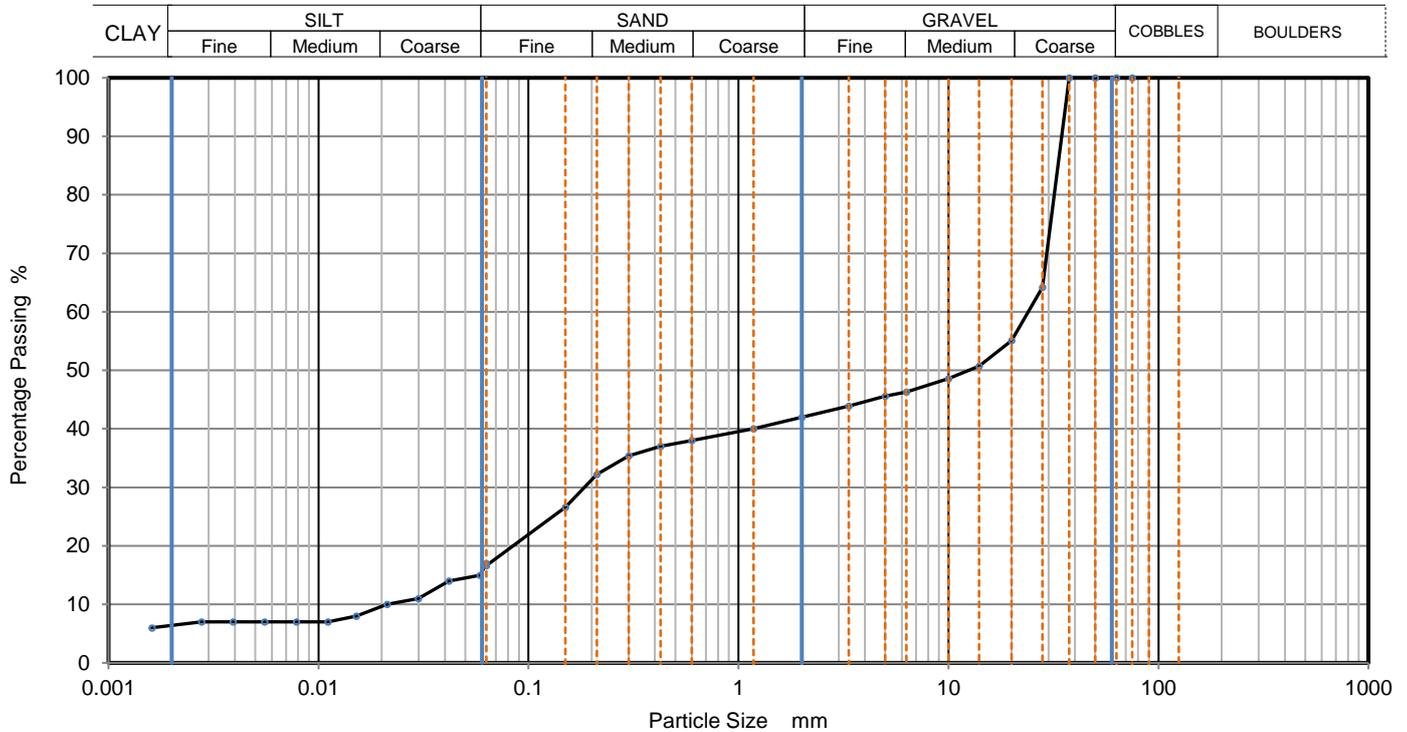
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP003
Sample No.	1
Depth, m	0.30
Sample Type	B
KeyLAB ID	IDL12021120714

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	17
		0.0588	15
75	100	0.0418	14
63	100	0.0299	11
50	100	0.0212	10
37.5	100	0.0151	8
28	64	0.0111	7
20	55	0.0078	7
14	51	0.0055	7
10	49	0.0039	7
6.3	46	0.0028	7
5	46	0.0016	6
3.35	44		
2	42		
1.18	40		
0.6	38	Particle density (assumed) 2.65 Mg/m ³	
0.425	37		
0.3	35		
0.212	32		
0.15	27		
0.063	17		

Dry Mass of sample, g 781

Sample Proportions	% dry mass
Very coarse	0
Gravel	58
Sand	25
Silt	11
Clay	6

Grading Analysis		
D100	mm	
D60	mm	23.9
D30	mm	0.185
D10	mm	0.023
Uniformity Coefficient		1000
Curvature Coefficient		0.062

Remarks
Preparation and testing in accordance with BS1377 unless noted below

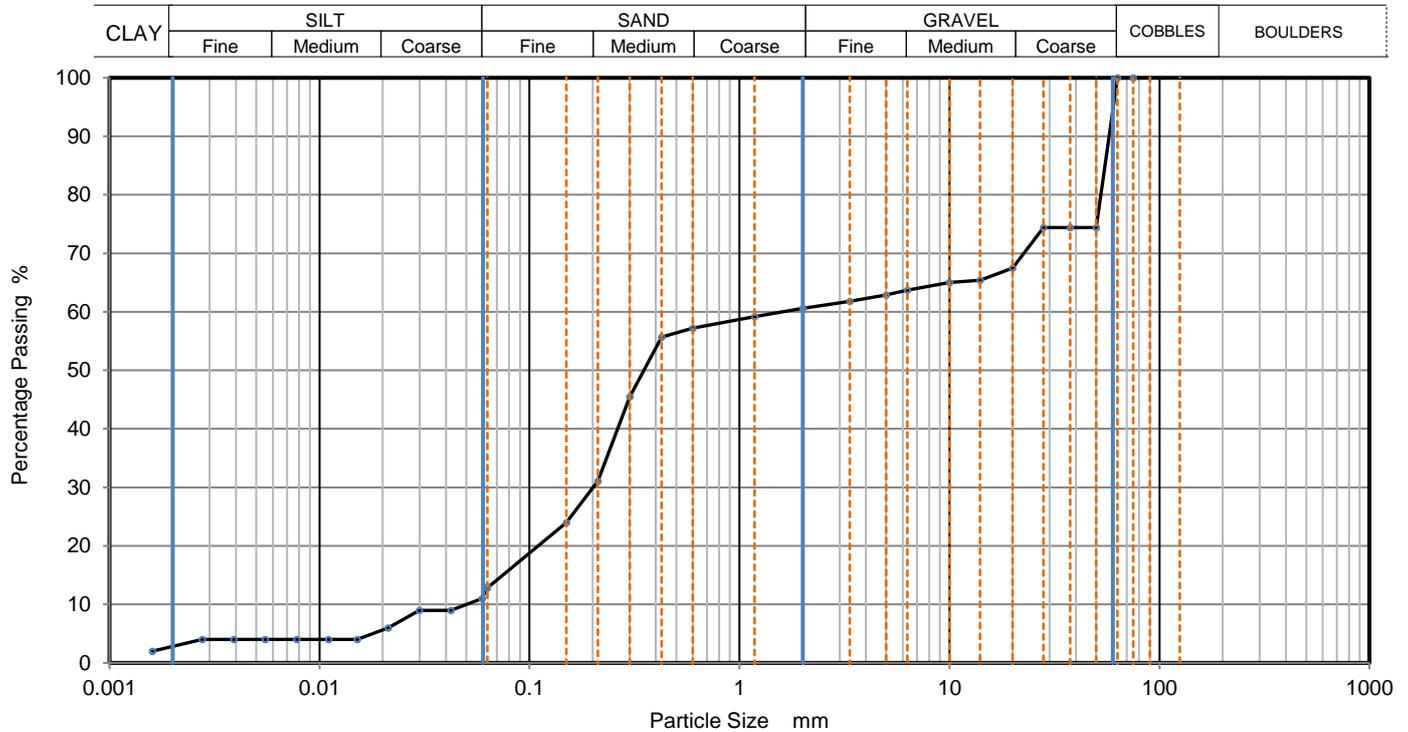
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP003
Sample No.	3
Depth, m	1.20
Sample Type	B
KeyLAB ID	IDL12021120716

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown silty very gravelly medium SAND. Gravel is coarse.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	13
		0.0595	11
75	100	0.0423	9
63	100	0.0299	9
50	74	0.0213	6
37.5	74	0.0151	4
28	74	0.0110	4
20	68	0.0078	4
14	65	0.0055	4
10	65	0.0039	4
6.3	64	0.0028	4
5	63	0.0016	2
3.35	62		
2	61		
1.18	59		
0.6	57	Particle density (assumed)	
0.425	56	2.65	Mg/m ³
0.3	46		
0.212	31		
0.15	24		
0.063	13		

Dry Mass of sample, g 901

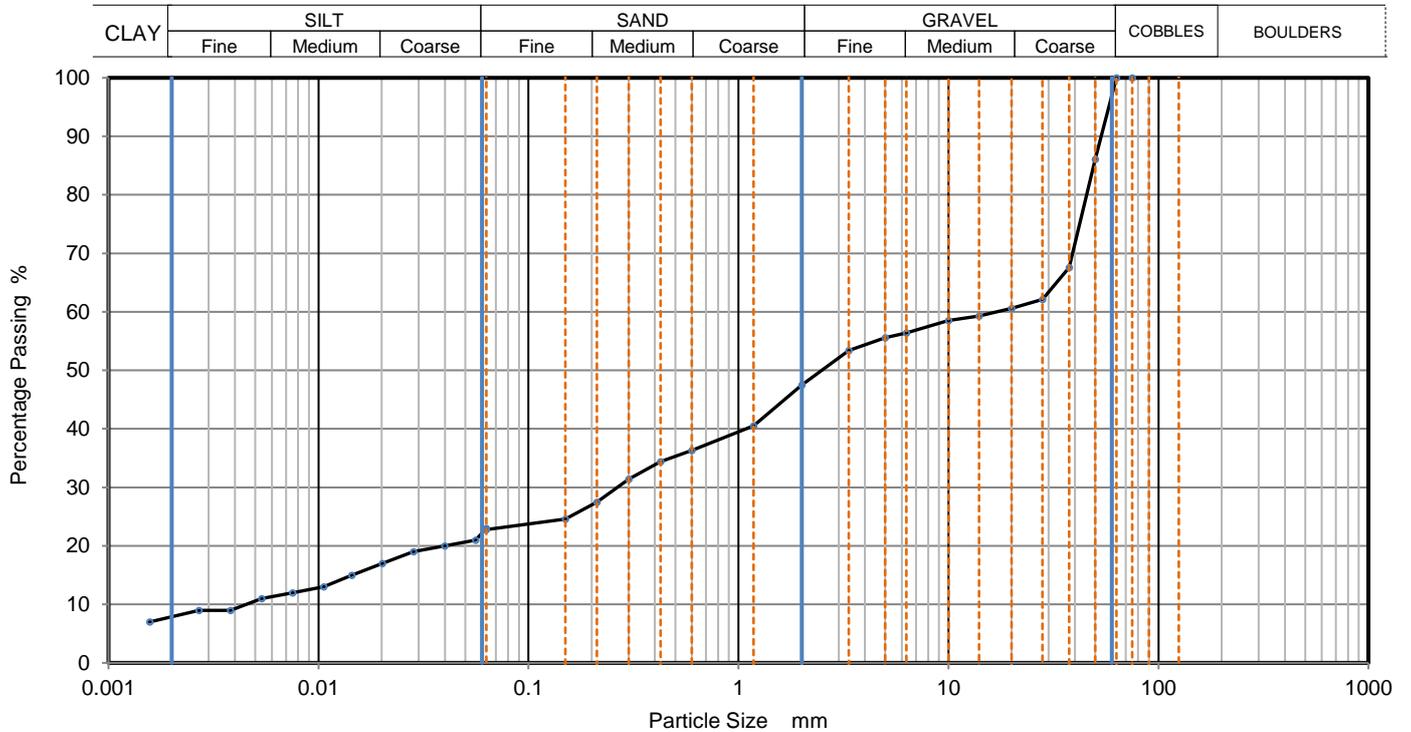
Sample Proportions	% dry mass
Very coarse	0
Gravel	39
Sand	48
Silt	10
Clay	3

Grading Analysis		
D100	mm	
D60	mm	1.59
D30	mm	0.201
D10	mm	0.0535
Uniformity Coefficient		30
Curvature Coefficient		0.47

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP003	
Site Name	WSP Eastern & Midlands Region		Sample No.	5	
Soil Description	Brownish-grey very sandy very silty coarse GRAVEL.		Depth, m	2.40	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120718	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	23
		0.0560	21
75	100	0.0399	20
63	100	0.0283	19
50	86	0.0202	17
37.5	68	0.0144	15
28	62	0.0106	13
20	61	0.0075	12
14	59	0.0054	11
10	59	0.0038	9
6.3	56	0.0027	9
5	56	0.0016	7
3.35	53		
2	48		
1.18	41		
0.6	36	Particle density (assumed)	
0.425	34	2.65	Mg/m3
0.3	31		
0.212	28		
0.15	25		
0.063	23		

Dry Mass of sample, g 1437

Sample Proportions	% dry mass
Very coarse	0
Gravel	53
Sand	25
Silt	15
Clay	8

Grading Analysis		
D100	mm	
D60	mm	17
D30	mm	0.264
D10	mm	0.00445
Uniformity Coefficient		3800
Curvature Coefficient		0.92

Remarks
Preparation and testing in accordance with BS1377 unless noted below

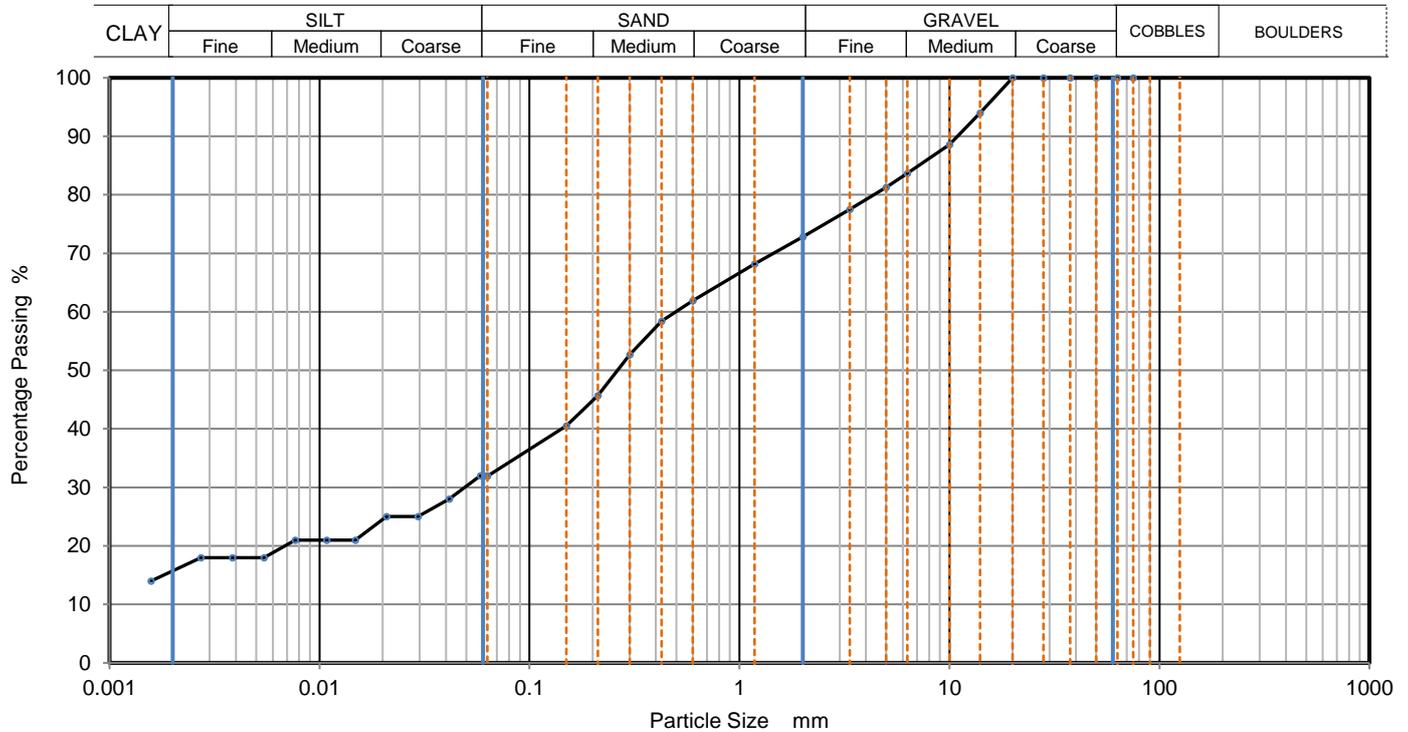
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP004
Sample No.	1
Depth, m	0.30
Sample Type	B
KeyLAB ID	IDL1202111300

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orange-brown very gravelly very silty SAND.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	32
		0.0583	32
75	100	0.0415	28
63	100	0.0295	25
50	100	0.0208	25
37.5	100	0.0148	21
28	100	0.0108	21
20	100	0.0077	21
14	94	0.0054	18
10	89	0.0038	18
6.3	84	0.0027	18
5	81	0.0016	14
3.35	78		
2	73		
1.18	68		
0.6	62	Particle density (assumed) 2.65 Mg/m ³	
0.425	58		
0.3	53		
0.212	46		
0.15	41		
0.063	32		

Dry Mass of sample, g 547

Sample Proportions	% dry mass
Very coarse	0
Gravel	27
Sand	41
Silt	16
Clay	16

Grading Analysis	
D100	mm
D60	mm 0.497
D30	mm 0.0486
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below

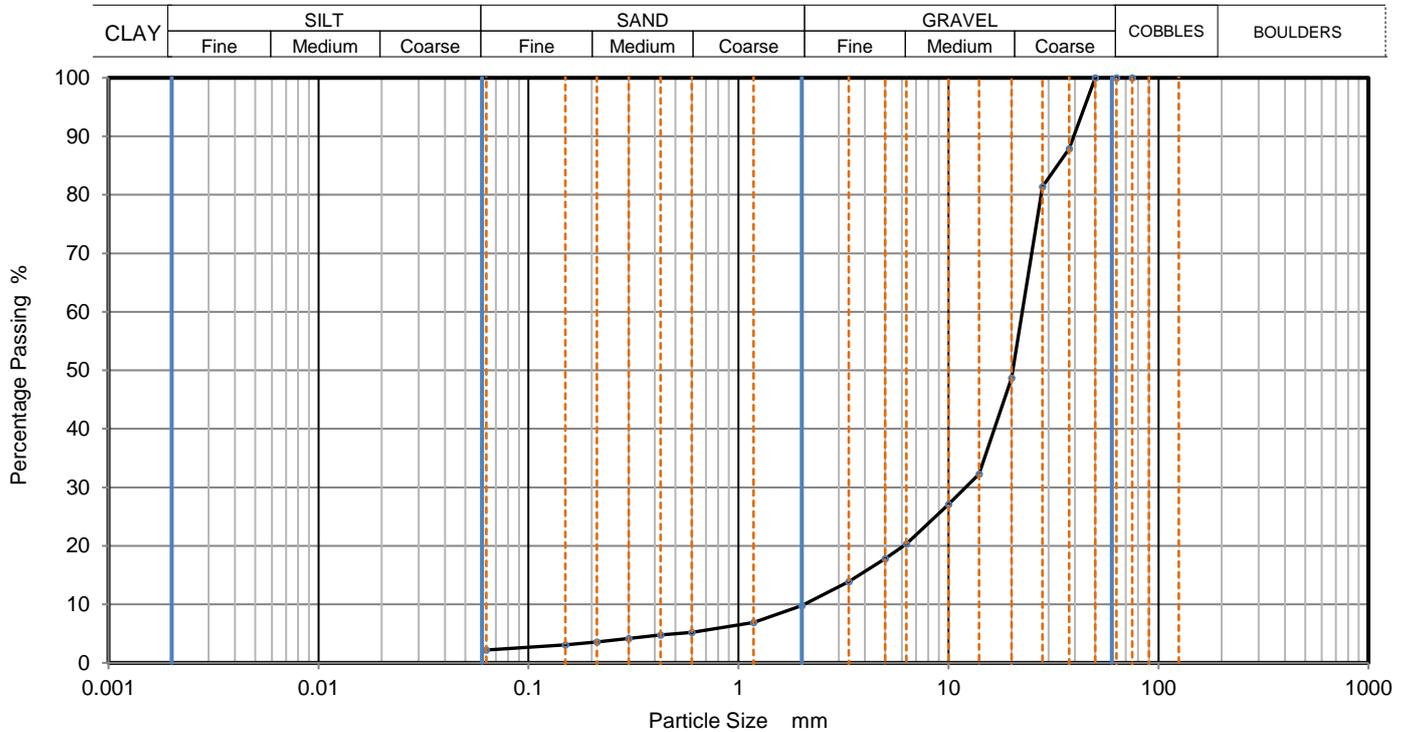
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP004
Sample No.	5
Depth, m	1.50
Sample Type	B
KeyLAB ID	IDL1202111305

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown slightly silty sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	88		
28	81		
20	49		
14	32		
10	27		
6.3	20		
5	18		
3.35	14		
2	10		
1.18	7		
0.6	5		
0.425	5	Particle density (assumed)	
0.3	4	2.65	Mg/m ³
0.212	4		
0.15	3		
0.063	2		

Dry Mass of sample, g 1066

Sample Proportions	% dry mass
Very coarse	0
Gravel	90
Sand	8
Fines <0.063mm	2

Grading Analysis		
D100	mm	
D60	mm	22.5
D30	mm	12.1
D10	mm	2.04
Uniformity Coefficient		11
Curvature Coefficient		3.2

Remarks
Preparation and testing in accordance with BS1377 unless noted below

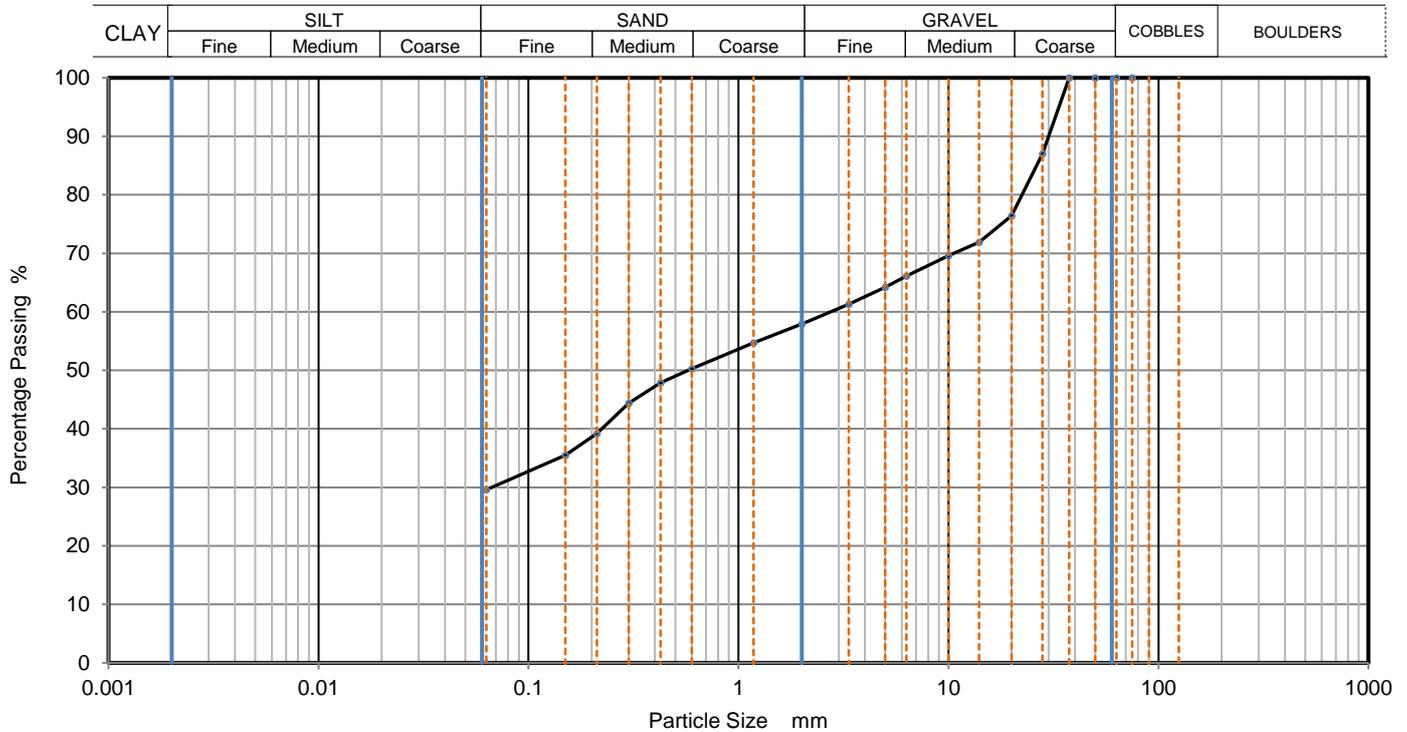
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP005
Sample No.	1
Depth, m	1.00
Sample Type	B
KeyLAB ID	IDL1202202040

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	87		
20	76		
14	72		
10	70		
6.3	66		
5	64		
3.35	61		
2	58		
1.18	55		
0.6	50		
0.425	48		
0.3	44		
0.212	39		
0.15	36		
0.063	30		

Dry Mass of sample, g 785

Sample Proportions	% dry mass
Very coarse	0
Gravel	42
Sand	28
Fines <0.063mm	30

Grading Analysis	
D100	mm
D60	mm 2.75
D30	mm 0.0666
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below

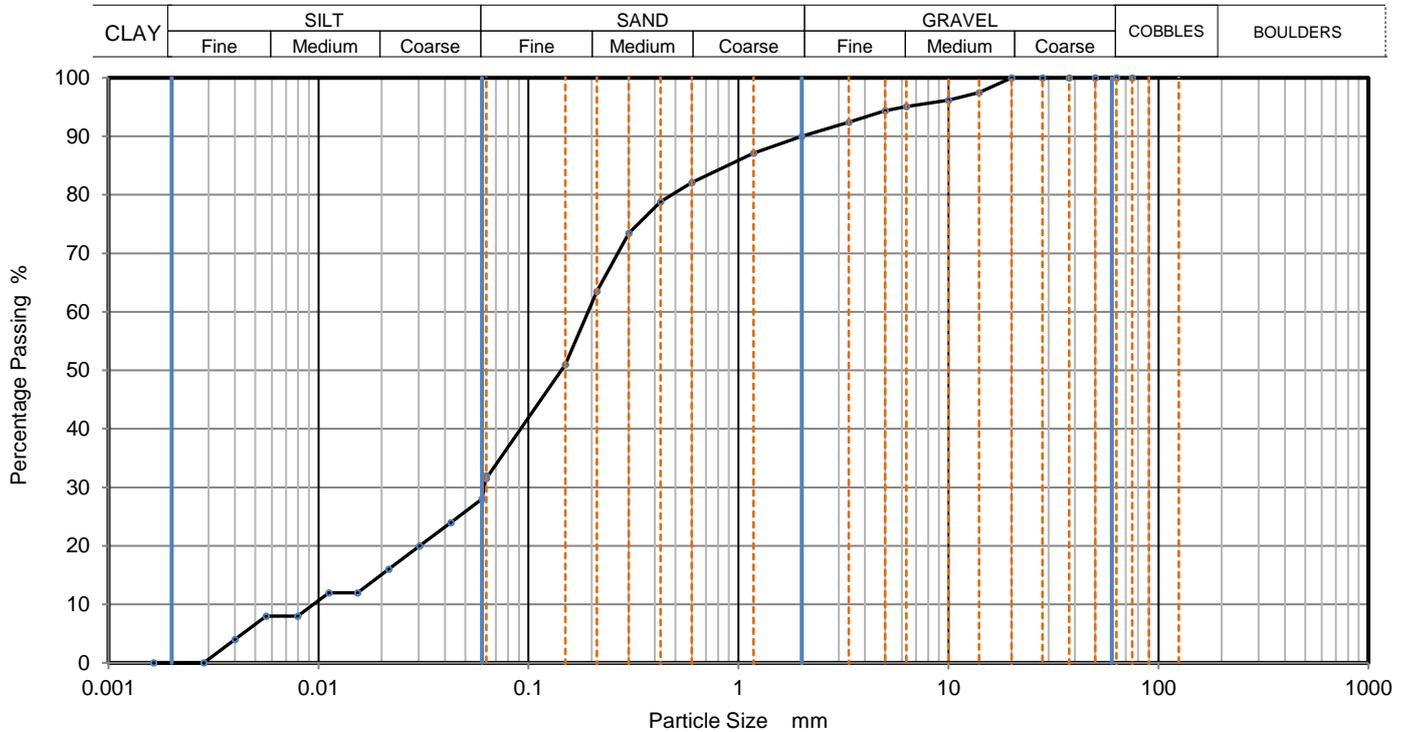
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP006
Sample No.	1
Depth, m	0.30
Sample Type	B
KeyLAB ID	IDL1202111306

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orangeish-brown gravelly very silty fine SAND.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	32
		0.0601	28
75	100	0.0427	24
63	100	0.0304	20
50	100	0.0216	16
37.5	100	0.0153	12
28	100	0.0112	12
20	100	0.0080	8
14	98	0.0056	8
10	96	0.0040	4
6.3	95	0.0028	0
5	94	0.0016	0
3.35	92		
2	90		
1.18	87		
0.6	82	Particle density (assumed) 2.65 Mg/m ³	
0.425	79		
0.3	73		
0.212	64		
0.15	51		
0.063	32		

Dry Mass of sample, g 395

Sample Proportions	% dry mass
Very coarse	0
Gravel	10
Sand	59
Silt	31
Clay	0

Grading Analysis		
D100	mm	
D60	mm	0.193
D30	mm	0.0619
D10	mm	0.00957
Uniformity Coefficient		20
Curvature Coefficient		2.1

Remarks
Preparation and testing in accordance with BS1377 unless noted below

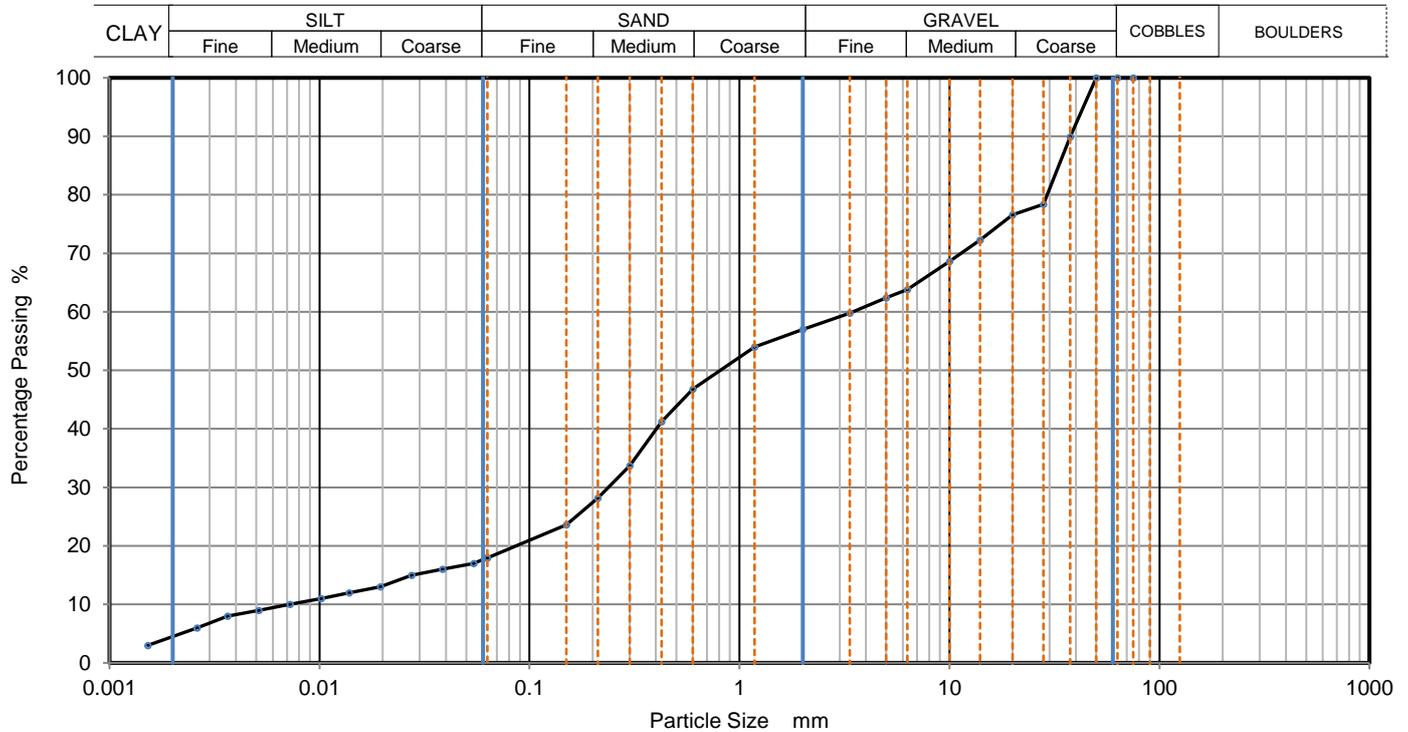
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP006
Sample No.	7
Depth, m	2.70
Sample Type	B
KeyLAB ID	IDL12021113013

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown silty f.m.c. SAND and c GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	18
		0.0542	17
75	100	0.0386	16
63	100	0.0274	15
50	100	0.0195	13
37.5	90	0.0139	12
28	78	0.0102	11
20	77	0.0072	10
14	72	0.0051	9
10	69	0.0037	8
6.3	64	0.0026	6
5	62	0.0015	3
3.35	60		
2	57		
1.18	54		
0.6	47	Particle density (assumed) 2.65 Mg/m ³	
0.425	41		
0.3	34		
0.212	28		
0.15	24		
0.063	18		

Dry Mass of sample, g 1161

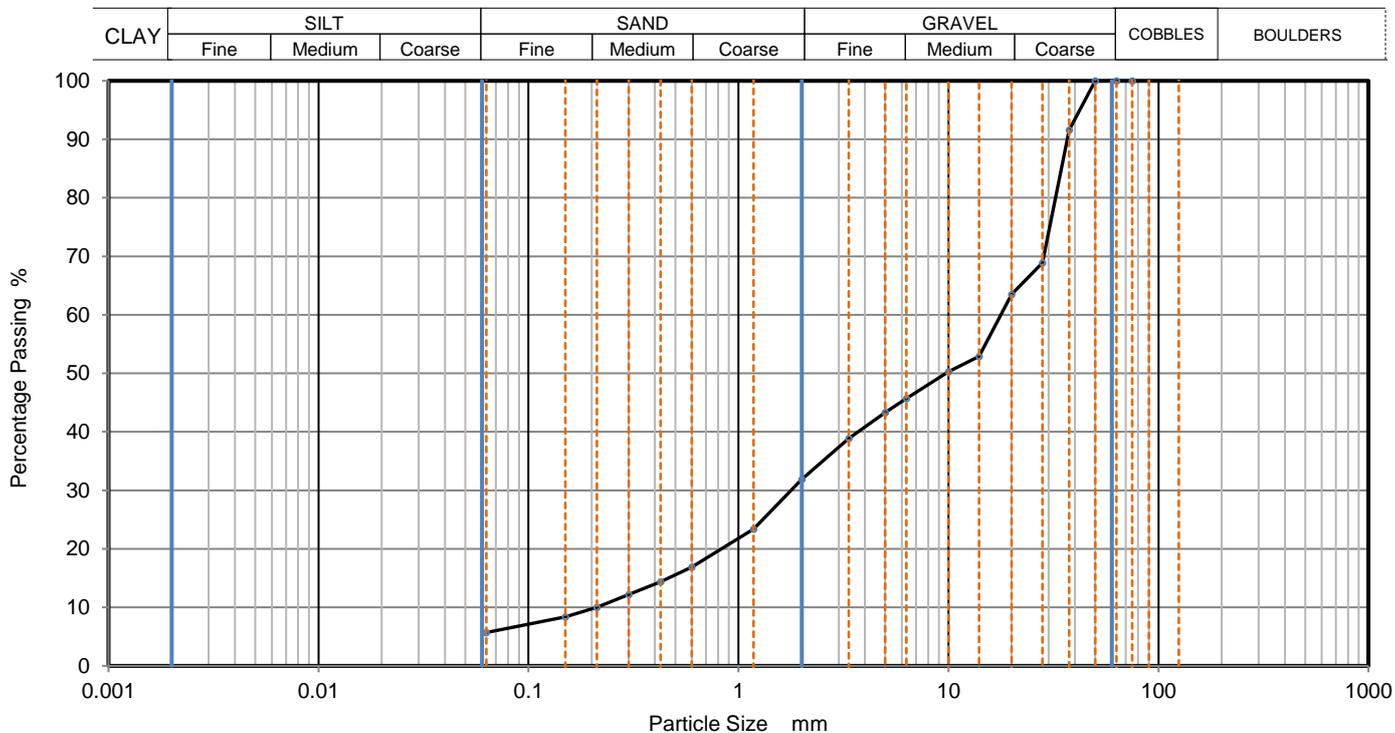
Sample Proportions	% dry mass
Very coarse	0
Gravel	43
Sand	39
Silt	13
Clay	5

Grading Analysis		
D100	mm	
D60	mm	3.48
D30	mm	0.238
D10	mm	0.00709
Uniformity Coefficient		490
Curvature Coefficient		2.3

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102
			Borehole/Pit No.	BPS-TP007
Site Name	WSP Eastern & Midlands Region		Sample No.	1
Soil Description	Greyish-brown silty very sandy coarse GRAVEL.		Depth, m	0.30
Specimen Reference	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL12021120720



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	92		
28	69		
20	64		
14	53		
10	50		
6.3	46		
5	43		
3.35	39		
2	32		
1.18	23		
0.6	17		
0.425	14	Particle density (assumed)	
0.3	12	2.65	Mg/m ³
0.212	10		
0.15	8		
0.063	6		

Dry Mass of sample, g

907

Sample Proportions	% dry mass
Very coarse	0
Gravel	68
Sand	26
Fines <0.063mm	6

Grading Analysis		
D100	mm	
D60	mm	17.8
D30	mm	1.78
D10	mm	0.212
Uniformity Coefficient		84
Curvature Coefficient		0.84

Remarks

Preparation and testing in accordance with BS1377 unless noted below

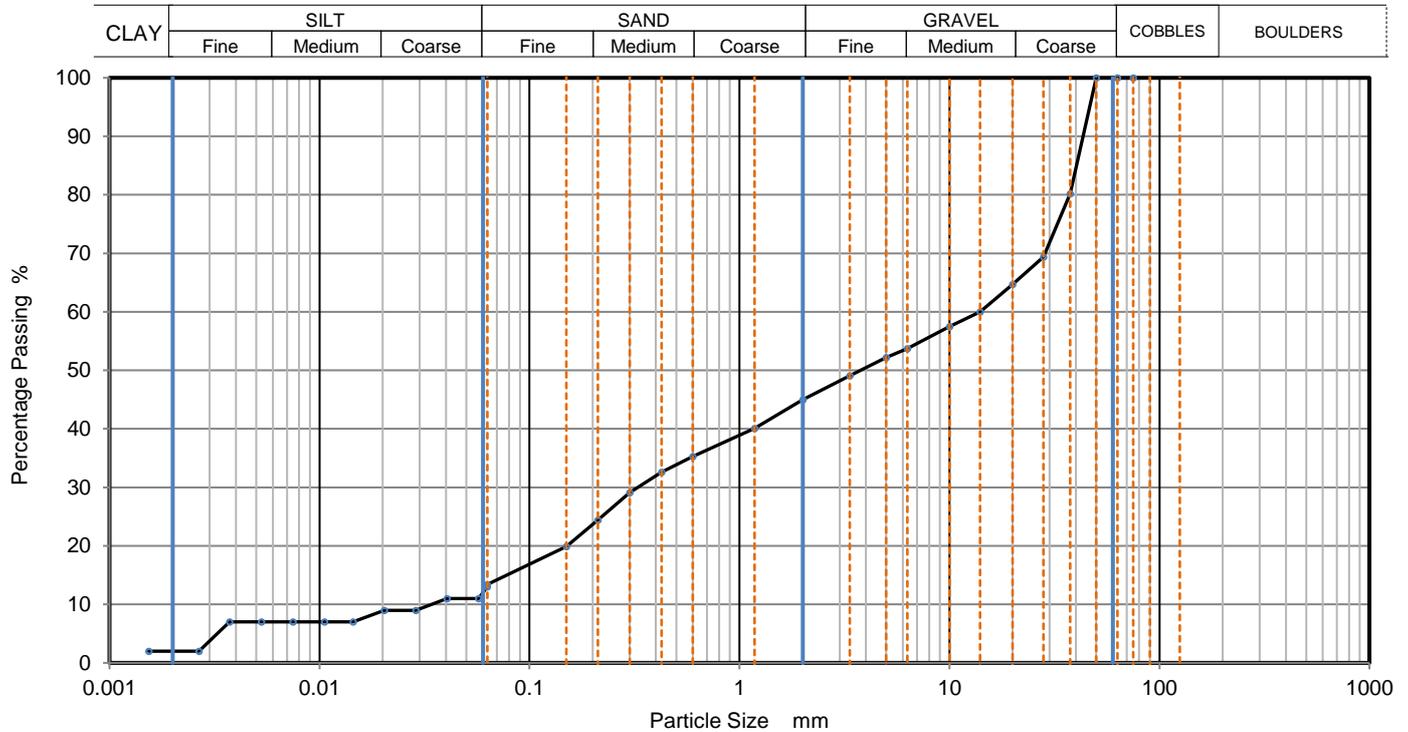
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP007
Sample No.	3
Depth, m	1.50
Sample Type	B
KeyLAB ID	IDL12021120722

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	13
		0.0572	11
75	100	0.0405	11
63	100	0.0288	9
50	100	0.0203	9
37.5	80	0.0145	7
28	69	0.0106	7
20	65	0.0075	7
14	60	0.0053	7
10	58	0.0037	7
6.3	54	0.0027	2
5	52	0.0015	2
3.35	49		
2	45		
1.18	40		
0.6	35	Particle density (assumed) 2.65 Mg/m ³	
0.425	33		
0.3	29		
0.212	24		
0.15	20		
0.063	13		

Dry Mass of sample, g 907

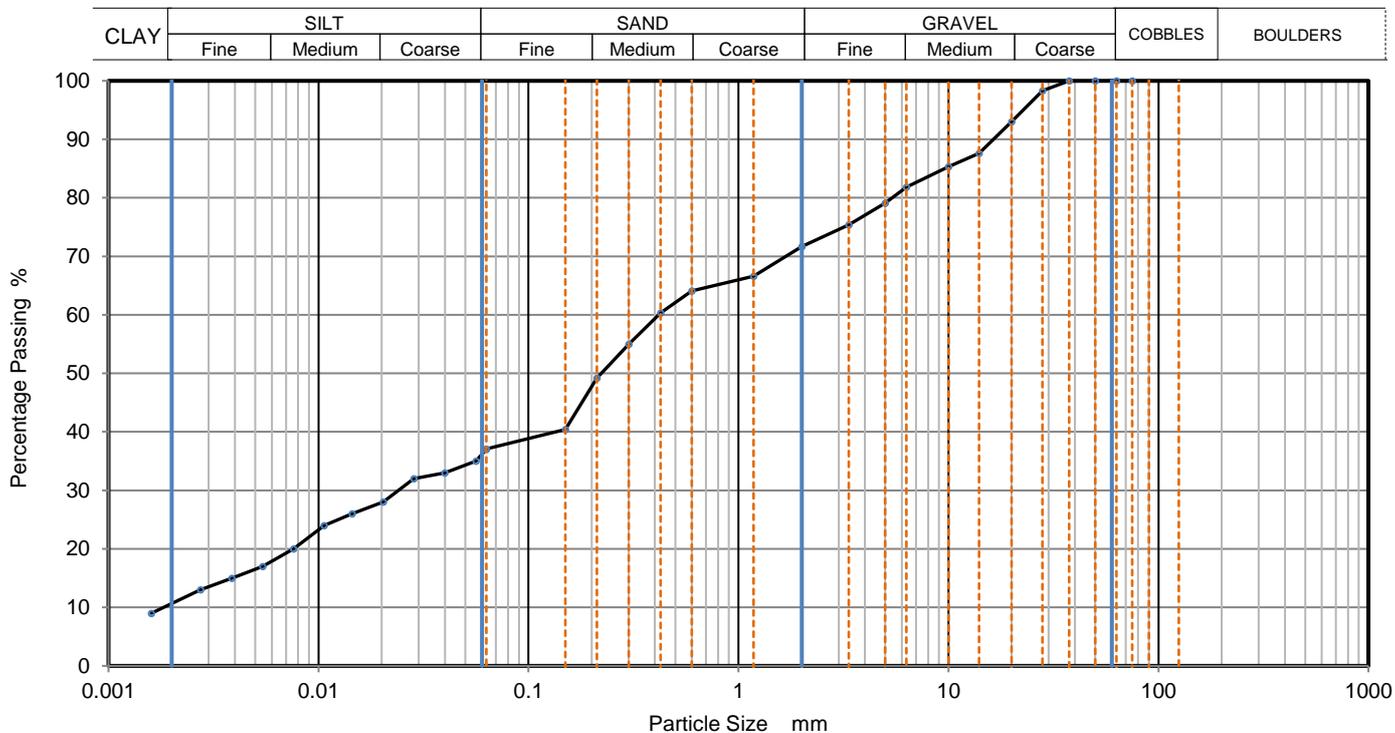
Sample Proportions	% dry mass
Very coarse	0
Gravel	55
Sand	32
Silt	11
Clay	2

Grading Analysis	
D100	mm
D60	mm 14.1
D30	mm 0.328
D10	mm 0.0339
Uniformity Coefficient	420
Curvature Coefficient	0.23

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP007	
Site Name	WSP Eastern & Midlands Region		Sample No.	5	
Soil Description	Brownish-grey slightly gravelly sandy SILT.		Depth, m	2.50	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120724	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	37
		0.0562	35
75	100	0.0400	33
63	100	0.0284	32
50	100	0.0203	28
37.5	100	0.0145	26
28	98	0.0106	24
20	93	0.0076	20
14	88	0.0054	17
10	85	0.0039	15
6.3	82	0.0027	13
5	79	0.0016	9
3.35	75		
2	72		
1.18	67		
0.6	64	Particle density (assumed)	
0.425	60	2.65	Mg/m3
0.3	55		
0.212	49		
0.15	40		
0.063	37		

Dry Mass of sample, g

750

Sample Proportions	% dry mass
Very coarse	0
Gravel	28
Sand	35
Silt	26
Clay	11

Grading Analysis		
D100	mm	
D60	mm	0.417
D30	mm	0.0247
D10	mm	0.00178
Uniformity Coefficient		230
Curvature Coefficient		0.83

Remarks

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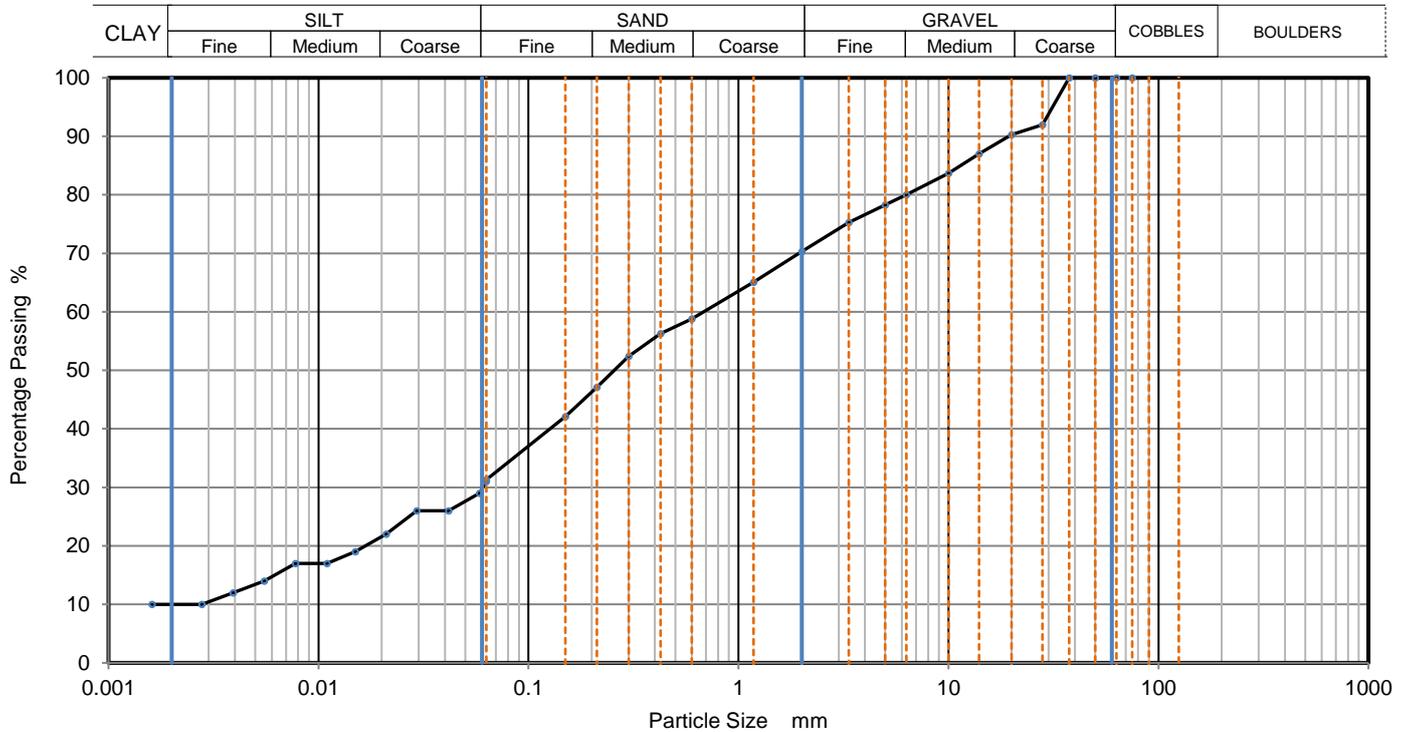
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP008
Sample No.	1
Depth, m	0.40
Sample Type	B
KeyLAB ID	IDL12021120726

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orangish-brown very silty SAND and GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	31
		0.0585	29
75	100	0.0416	26
63	100	0.0294	26
50	100	0.0210	22
37.5	100	0.0149	19
28	92	0.0110	17
20	90	0.0078	17
14	87	0.0055	14
10	84	0.0039	12
6.3	80	0.0028	10
5	78	0.0016	10
3.35	75		
2	70		
1.18	65		
0.6	59	Particle density (assumed) 2.65 Mg/m ³	
0.425	56		
0.3	52		
0.212	47		
0.15	42		
0.063	31		

Dry Mass of sample, g 644

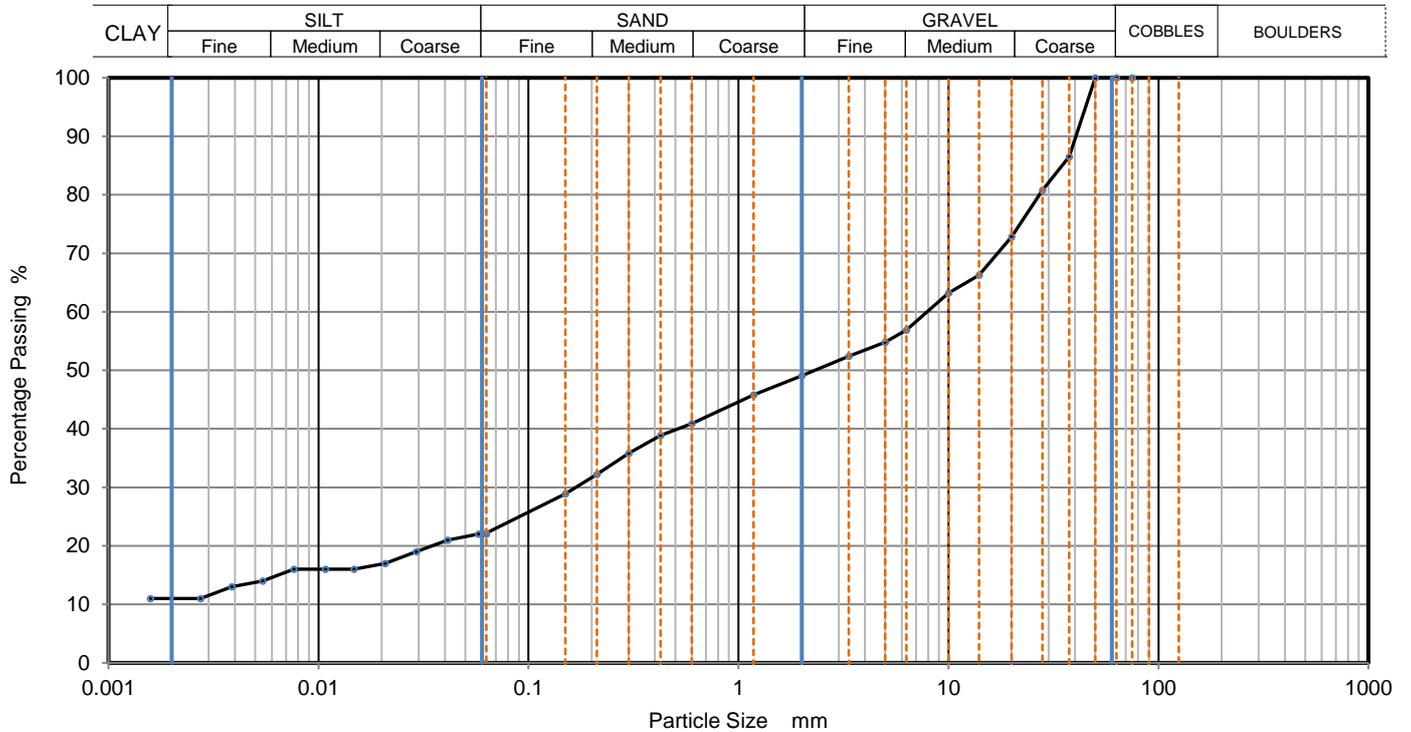
Sample Proportions	% dry mass
Very coarse	0
Gravel	30
Sand	39
Silt	22
Clay	10

Grading Analysis		
D100	mm	
D60	mm	0.685
D30	mm	0.0605
D10	mm	0.00294
Uniformity Coefficient		230
Curvature Coefficient		1.8

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP008	
Site Name	WSP Eastern & Midlands Region		Sample No.	3	
Soil Description	Light brown very silty very sandy coarse GRAVEL.		Depth, m	1.50	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120729	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	22
		0.0578	22
75	100	0.0411	21
63	100	0.0292	19
50	100	0.0208	17
37.5	87	0.0148	16
28	81	0.0108	16
20	73	0.0076	16
14	66	0.0054	14
10	63	0.0039	13
6.3	57	0.0027	11
5	55	0.0016	11
3.35	52		
2	49		
1.18	46		
0.6	41	Particle density (assumed)	
0.425	39	2.65	Mg/m ³
0.3	36		
0.212	32		
0.15	29		
0.063	22		

Dry Mass of sample, g 790

Sample Proportions	% dry mass
Very coarse	0
Gravel	51
Sand	27
Silt	11
Clay	11

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

Remarks
Preparation and testing in accordance with BS1377 unless noted below

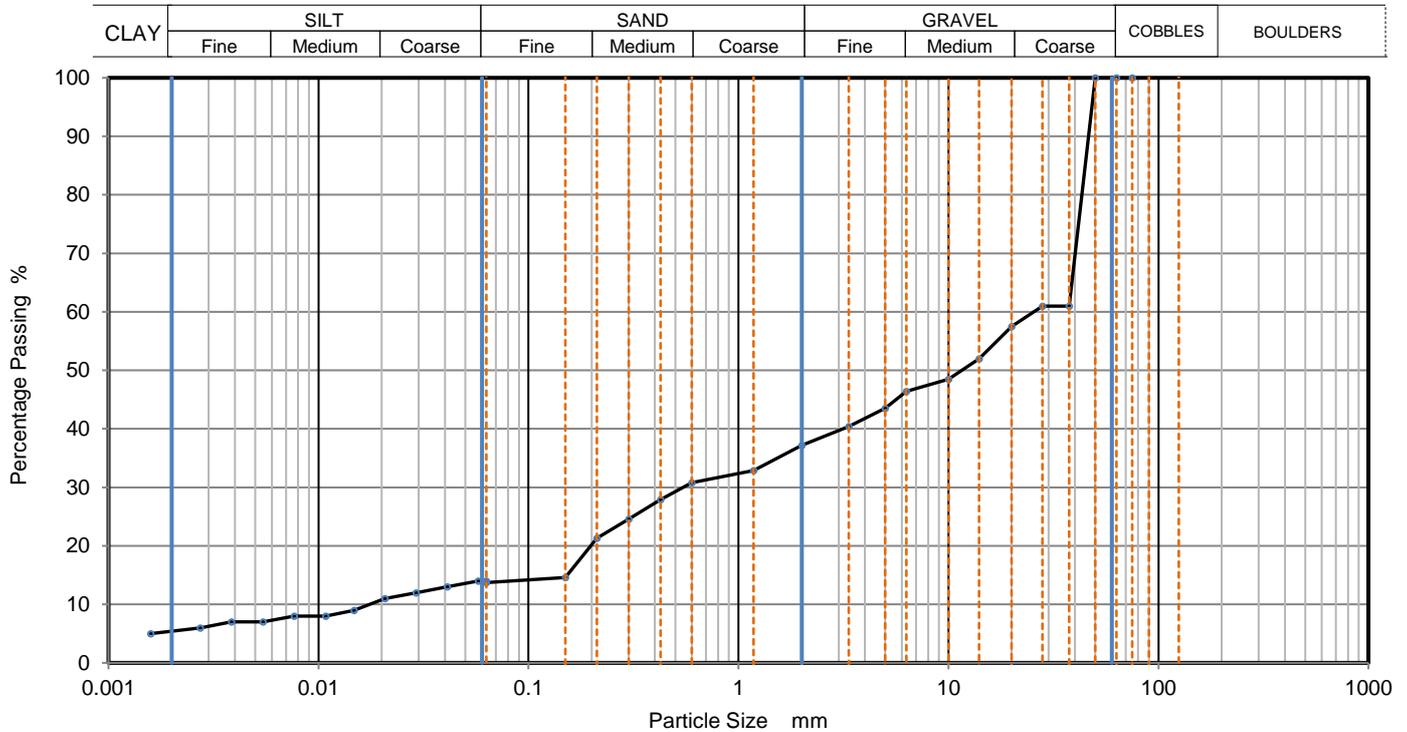
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP008
Sample No.	5
Depth, m	3.00
Sample Type	B
KeyLAB ID	IDL12021120731

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	14
		0.0577	14
75	100	0.0410	13
63	100	0.0292	12
50	100	0.0207	11
37.5	61	0.0147	9
28	61	0.0108	8
20	58	0.0077	8
14	52	0.0054	7
10	49	0.0038	7
6.3	46	0.0027	6
5	44	0.0016	5
3.35	40		
2	37		
1.18	33		
0.6	31	Particle density (assumed) 2.65 Mg/m ³	
0.425	28		
0.3	25		
0.212	21		
0.15	15		
0.063	14		

Dry Mass of sample, g 889

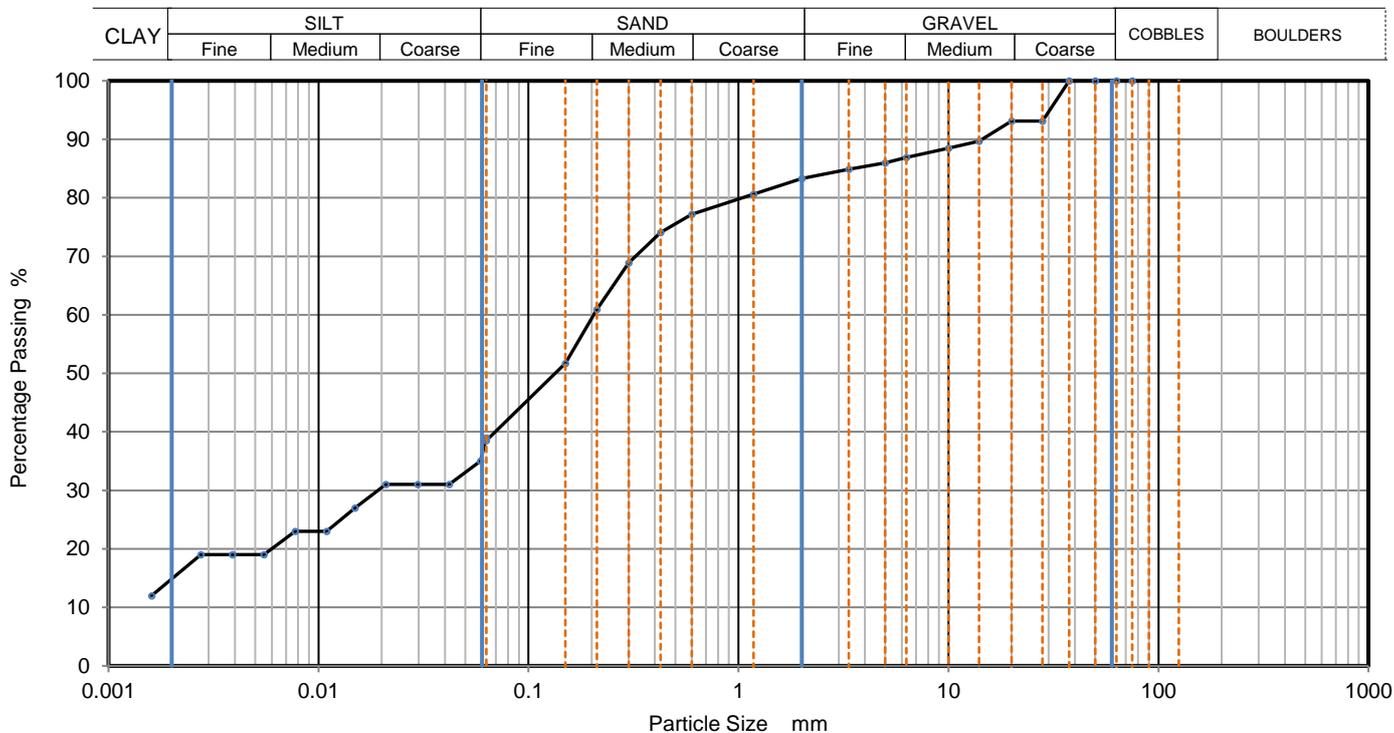
Sample Proportions	% dry mass
Very coarse	0
Gravel	63
Sand	24
Silt	8
Clay	6

Grading Analysis		
D100	mm	
D60	mm	25.5
D30	mm	0.545
D10	mm	0.0174
Uniformity Coefficient		1500
Curvature Coefficient		0.67

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP009	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Orangish-brown slightly gravelly sandy SILT. Sand is fine and medium.		Depth, m	0.40	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120733	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	39
		0.0590	35
75	100	0.0419	31
63	100	0.0296	31
50	100	0.0210	31
37.5	100	0.0149	27
28	93	0.0109	23
20	93	0.0077	23
14	90	0.0055	19
10	89	0.0039	19
6.3	87	0.0027	19
5	86	0.0016	12
3.35	85		
2	83		
1.18	81		
0.6	77	Particle density (assumed)	
0.425	74	2.65	Mg/m ³
0.3	69		
0.212	61		
0.15	52		
0.063	39		

Dry Mass of sample, g

612

Sample Proportions	% dry mass
Very coarse	0
Gravel	17
Sand	45
Silt	24
Clay	15

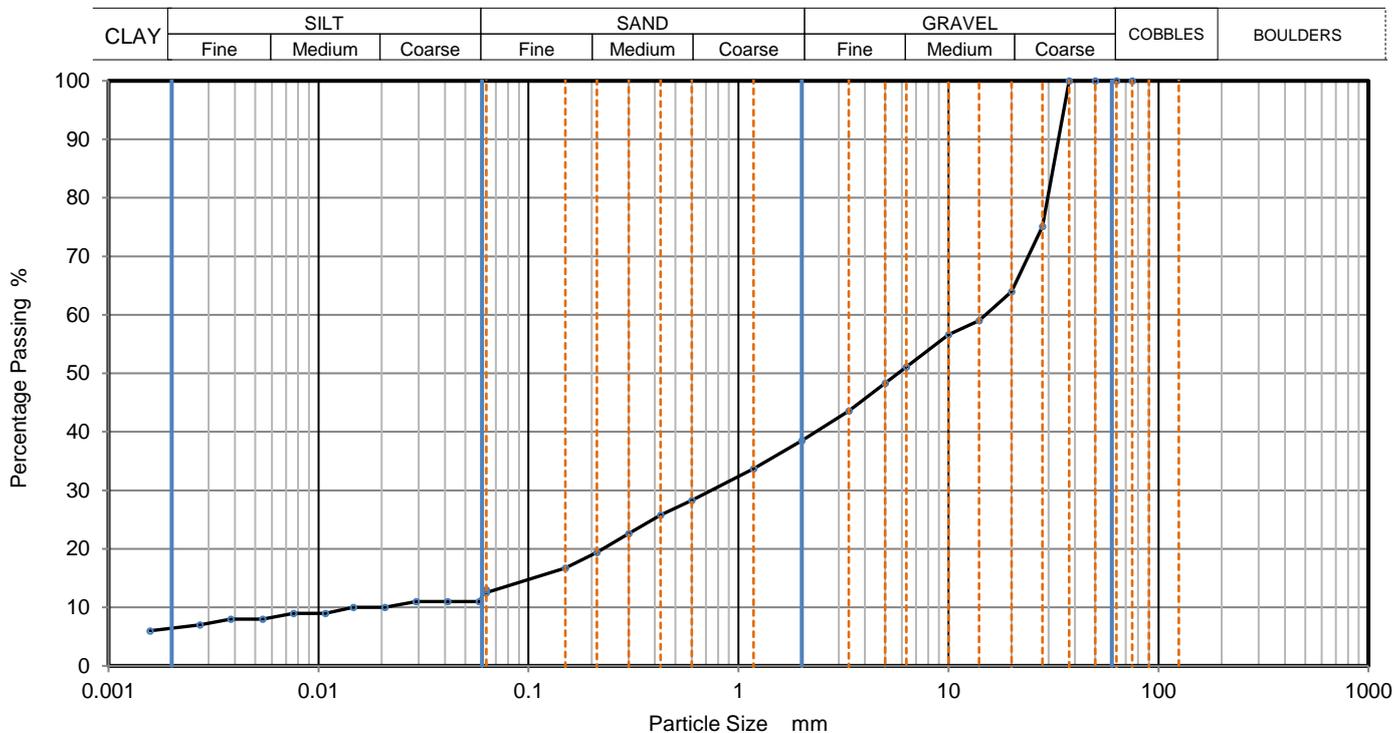
Grading Analysis		
D100	mm	
D60	mm	0.205
D30	mm	0.0195
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP009	
Site Name	WSP Eastern & Midlands Region		Sample No.	5	
Soil Description	Light brown silty very sandy coarse GRAVEL.		Depth, m	2.50	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120738	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	13
		0.0583	11
75	100	0.0412	11
63	100	0.0292	11
50	100	0.0207	10
37.5	100	0.0147	10
28	75	0.0108	9
20	64	0.0076	9
14	59	0.0054	8
10	57	0.0038	8
6.3	51	0.0027	7
5	48	0.0016	6
3.35	44		
2	39		
1.18	34		
0.6	28	Particle density (assumed)	
0.425	26	2.65	Mg/m ³
0.3	23		
0.212	19		
0.15	17		
0.063	13		

Dry Mass of sample, g

942

Sample Proportions	% dry mass
Very coarse	0
Gravel	62
Sand	26
Silt	6
Clay	7

Grading Analysis		
D100	mm	
D60	mm	15
D30	mm	0.741
D10	mm	0.013
Uniformity Coefficient		1200
Curvature Coefficient		2.8

Remarks

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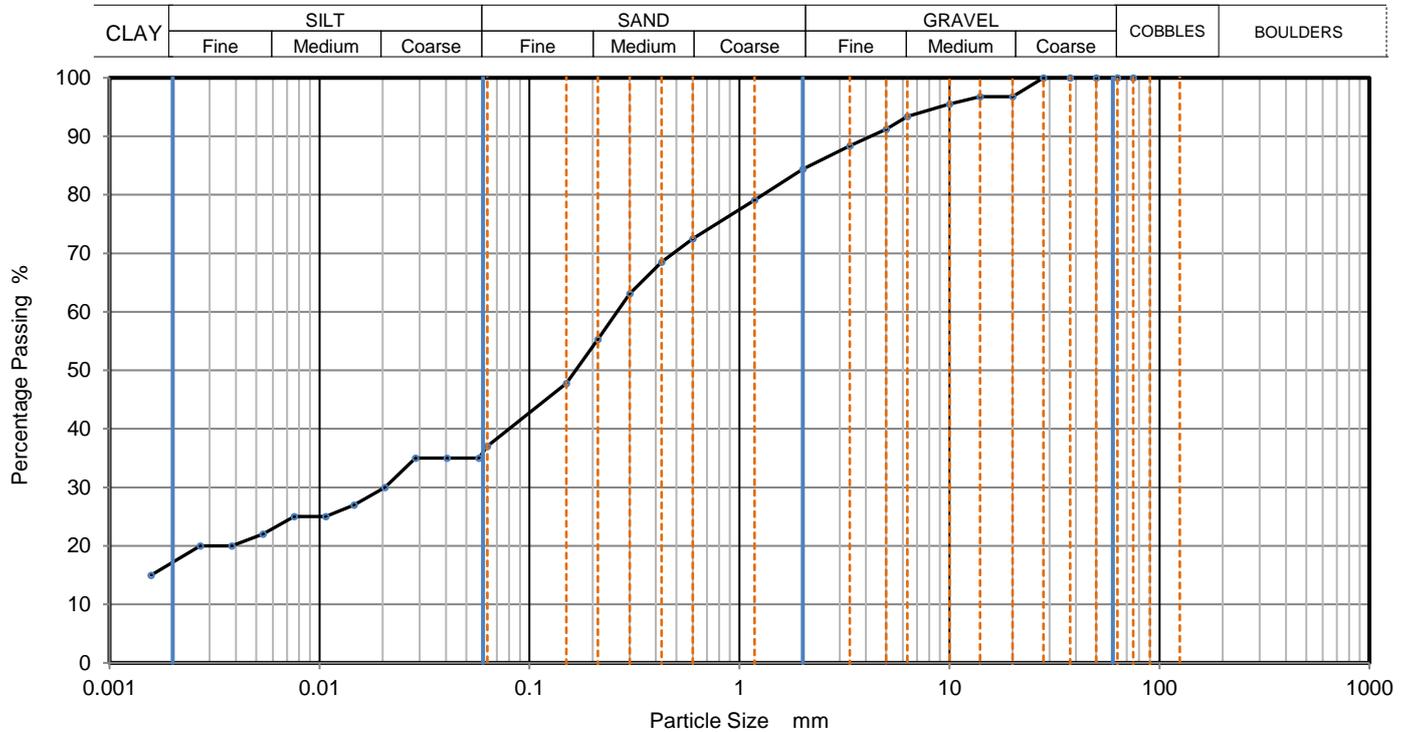
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP010
Sample No.	1
Depth, m	0.40
Sample Type	B
KeyLAB ID	IDL12021120739

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orange-brown slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	37
		0.0573	35
75	100	0.0405	35
63	100	0.0287	35
50	100	0.0205	30
37.5	100	0.0146	27
28	100	0.0107	25
20	97	0.0076	25
14	97	0.0054	22
10	96	0.0038	20
6.3	93	0.0027	20
5	91	0.0016	15
3.35	88		
2	84		
1.18	79		
0.6	73		
0.425	69	Particle density (assumed)	
0.3	63	2.65	Mg/m3
0.212	55		
0.15	48		
0.063	37		

Dry Mass of sample, g 708

Sample Proportions	% dry mass
Very coarse	0
Gravel	16
Sand	48
Silt	20
Clay	17

Grading Analysis		
D100	mm	
D60	mm	0.261
D30	mm	0.0211
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

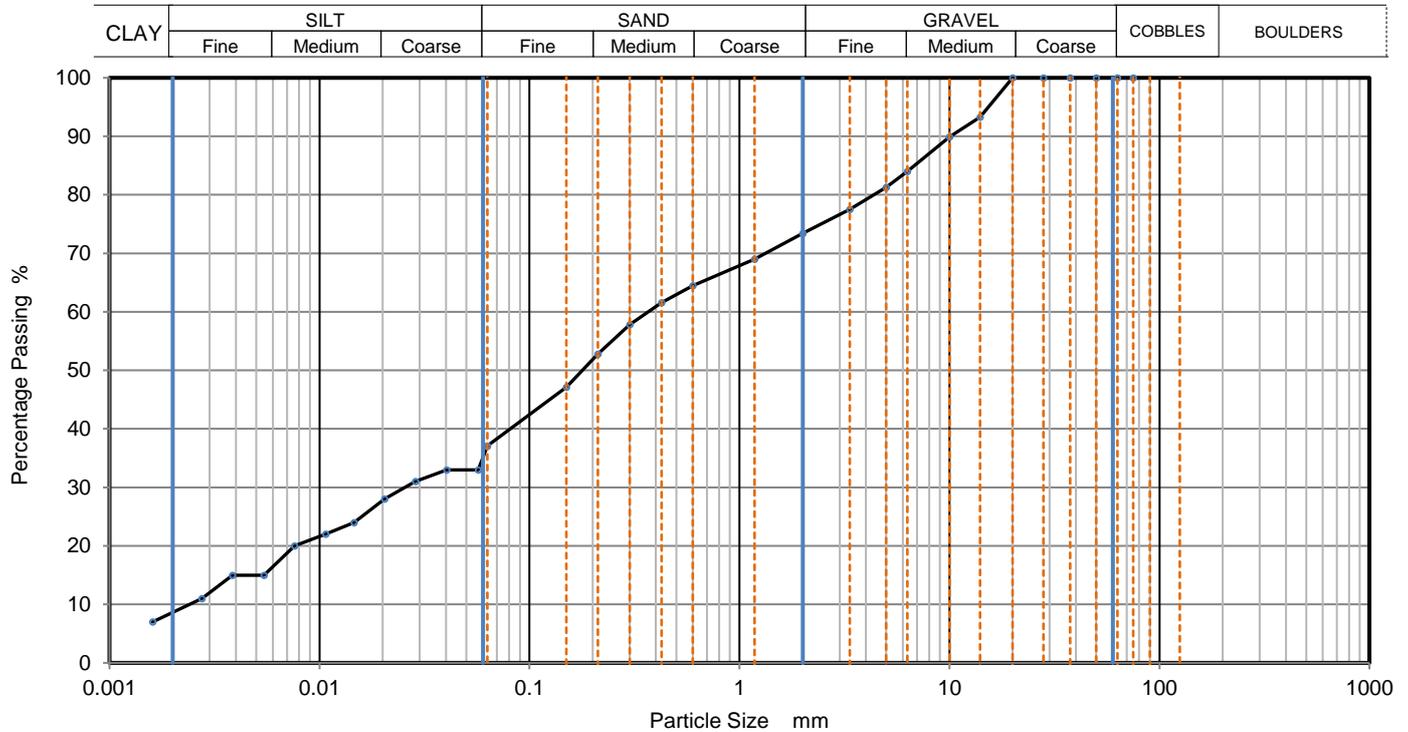
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP010
Sample No.	3
Depth, m	1.70
Sample Type	B
KeyLAB ID	IDL12021120742

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	37
		0.0570	33
75	100	0.0403	33
63	100	0.0287	31
50	100	0.0204	28
37.5	100	0.0146	24
28	100	0.0107	22
20	100	0.0076	20
14	93	0.0054	15
10	90	0.0038	15
6.3	84	0.0027	11
5	81	0.0016	7
3.35	78		
2	73		
1.18	69		
0.6	65	Particle density (assumed) 2.65 Mg/m ³	
0.425	62		
0.3	58		
0.212	53		
0.15	47		
0.063	37		

Dry Mass of sample, g 739

Sample Proportions	% dry mass
Very coarse	0
Gravel	27
Sand	36
Silt	29
Clay	8

Grading Analysis		
D100	mm	
D60	mm	0.368
D30	mm	0.0263
D10	mm	0.00246
Uniformity Coefficient		150
Curvature Coefficient		0.77

Remarks
Preparation and testing in accordance with BS1377 unless noted below

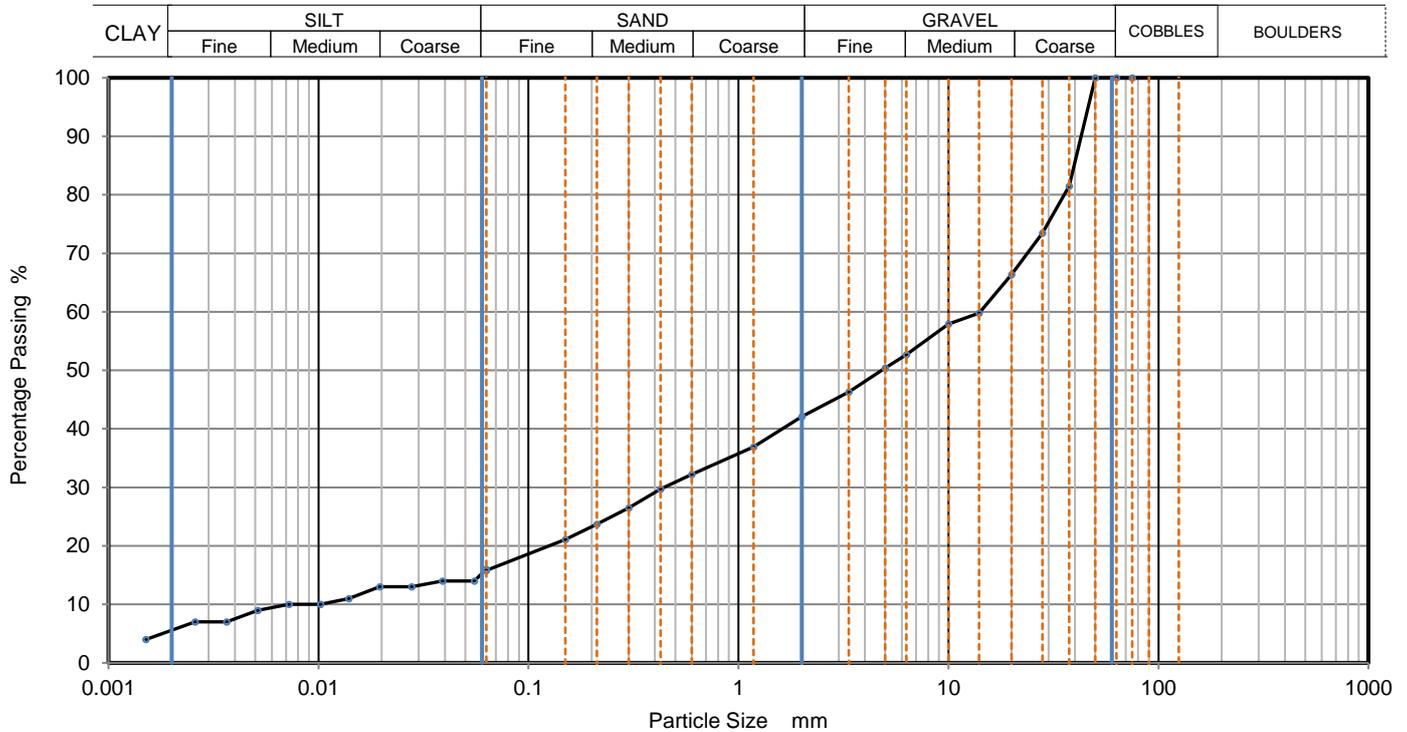
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP011
Sample No.	1
Depth, m	0.40
Sample Type	B
KeyLAB ID	IDL12021120744

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	16
		0.0551	14
75	100	0.0390	14
63	100	0.0277	13
50	100	0.0196	13
37.5	82	0.0139	11
28	74	0.0102	10
20	66	0.0072	10
14	60	0.0051	9
10	58	0.0037	7
6.3	53	0.0026	7
5	50	0.0015	4
3.35	46		
2	42		
1.18	37		
0.6	32	Particle density (assumed) 2.65 Mg/m ³	
0.425	30		
0.3	27		
0.212	24		
0.15	21		
0.063	16		

Dry Mass of sample, g 1138

Sample Proportions	% dry mass
Very coarse	0
Gravel	58
Sand	26
Silt	10
Clay	6

Grading Analysis		
D100	mm	
D60	mm	14.2
D30	mm	0.444
D10	mm	0.00714
Uniformity Coefficient		2000
Curvature Coefficient		2

Remarks
Preparation and testing in accordance with BS1377 unless noted below

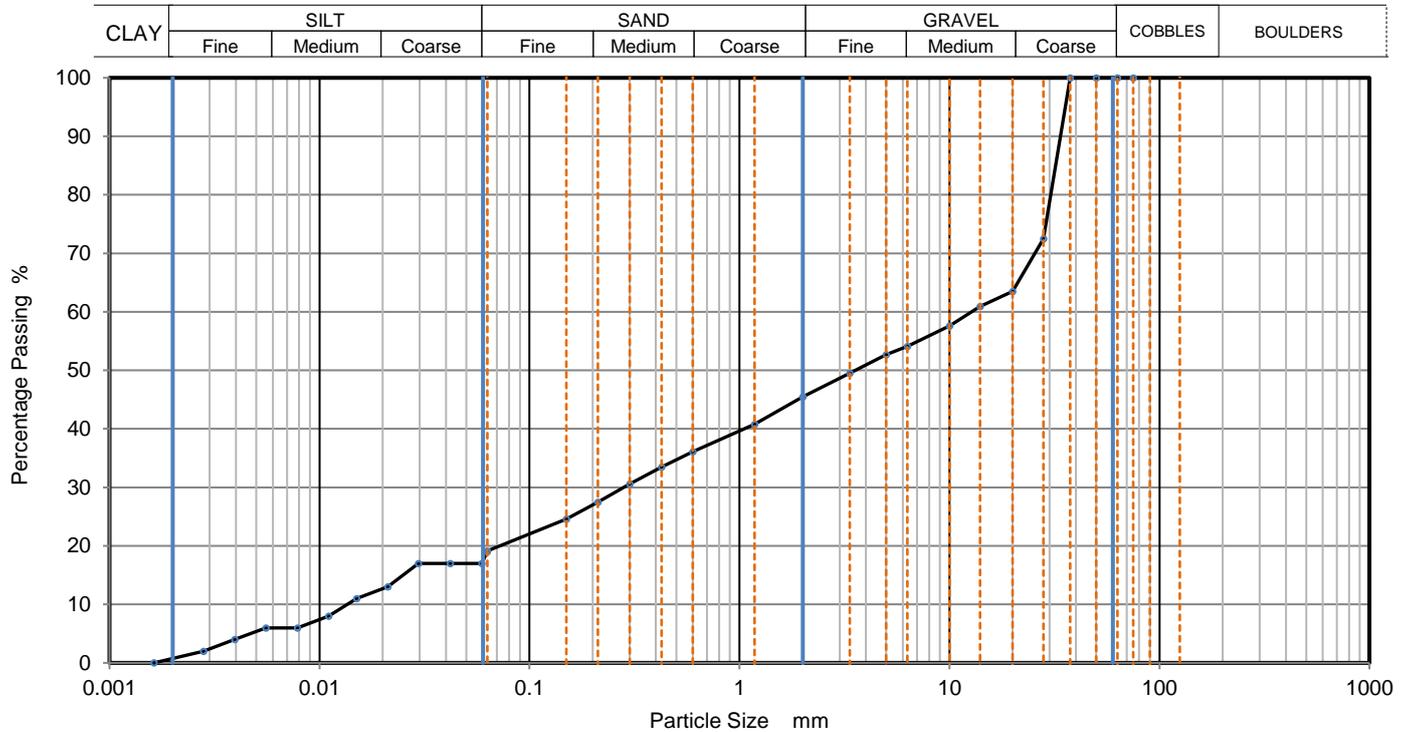
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP011
Sample No.	3
Depth, m	1.30
Sample Type	B
KeyLAB ID	IDL12021120746

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	19
		0.0592	17
75	100	0.0419	17
63	100	0.0296	17
50	100	0.0212	13
37.5	100	0.0150	11
28	73	0.0110	8
20	64	0.0078	6
14	61	0.0055	6
10	58	0.0039	4
6.3	54	0.0028	2
5	53	0.0016	0
3.35	50		
2	46		
1.18	41		
0.6	36	Particle density (assumed) 2.65 Mg/m ³	
0.425	34		
0.3	31		
0.212	28		
0.15	25		
0.063	19		

Dry Mass of sample, g 789

Sample Proportions	% dry mass
Very coarse	0
Gravel	55
Sand	26
Silt	18
Clay	1

Grading Analysis		
D100	mm	
D60	mm	12.8
D30	mm	0.28
D10	mm	0.0138
Uniformity Coefficient		930
Curvature Coefficient		0.45

Remarks
Preparation and testing in accordance with BS1377 unless noted below

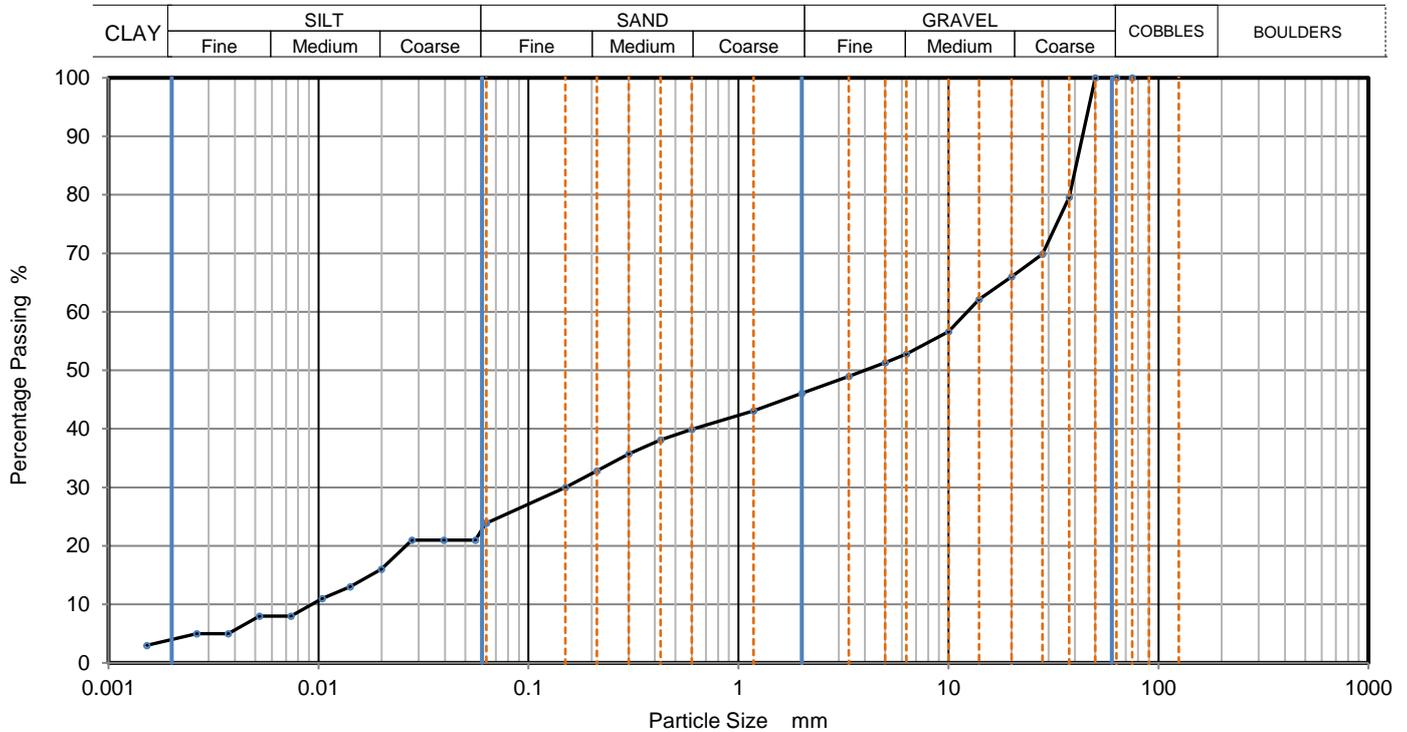
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP011
Sample No.	7
Depth, m	3.30
Sample Type	B
KeyLAB ID	IDL12021120750

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	24
		0.0557	21
75	100	0.0394	21
63	100	0.0279	21
50	100	0.0199	16
37.5	80	0.0142	13
28	70	0.0104	11
20	66	0.0074	8
14	62	0.0052	8
10	57	0.0037	5
6.3	53	0.0026	5
5	51	0.0015	3
3.35	49		
2	46		
1.18	43		
0.6	40	Particle density (assumed) 2.65 Mg/m ³	
0.425	38		
0.3	36		
0.212	33		
0.15	30		
0.063	24		

Dry Mass of sample, g 1056

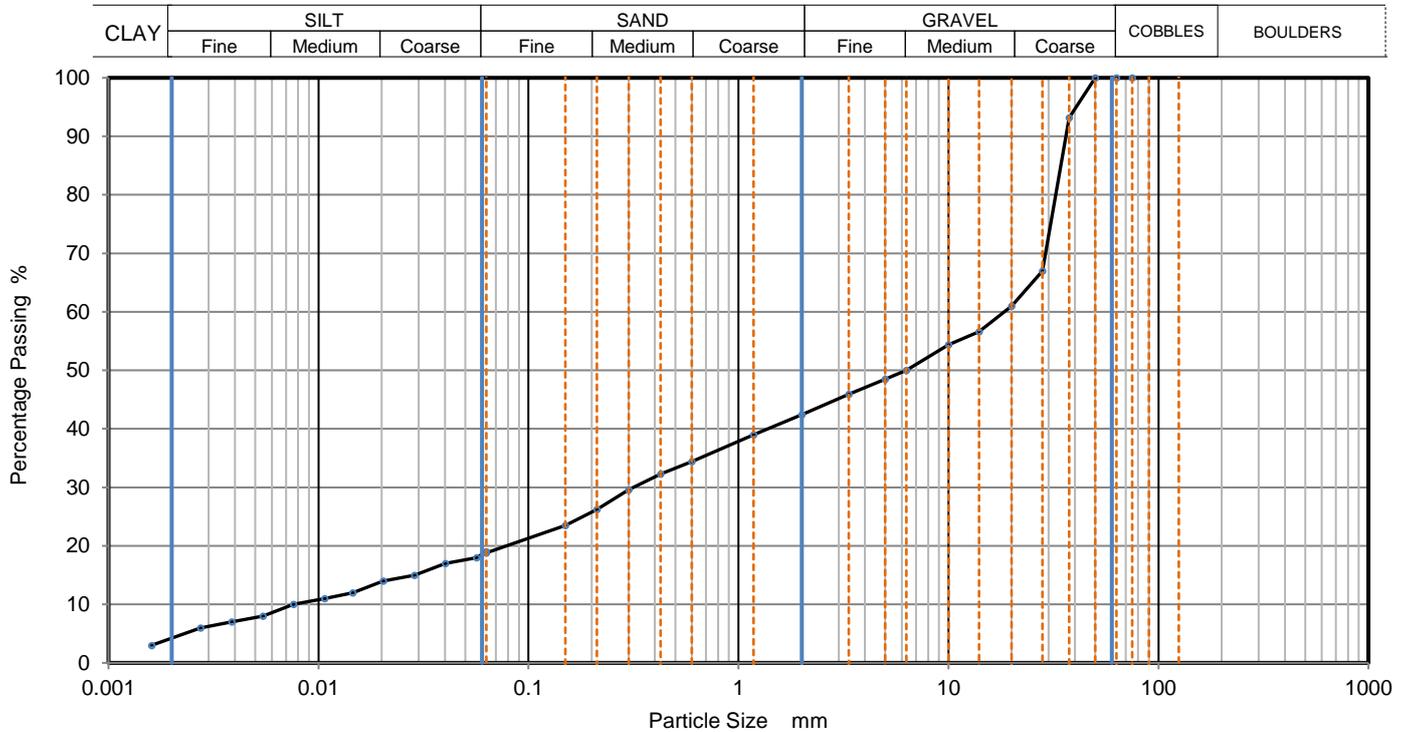
Sample Proportions	% dry mass
Very coarse	0
Gravel	54
Sand	22
Silt	20
Clay	4

Grading Analysis		
D100	mm	
D60	mm	12.3
D30	mm	0.15
D10	mm	0.0096
Uniformity Coefficient		1300
Curvature Coefficient		0.19

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP012	
Site Name	WSP Eastern & Midlands Region		Sample No.	3	
Soil Description	Brown silty very sandy coarse GRAVEL.		Depth, m	1.20	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021113018	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	19
		0.0566	18
75	100	0.0402	17
63	100	0.0286	15
50	100	0.0204	14
37.5	93	0.0146	12
28	67	0.0107	11
20	61	0.0076	10
14	57	0.0054	8
10	54	0.0039	7
6.3	50	0.0027	6
5	49	0.0016	3
3.35	46		
2	42		
1.18	39		
0.6	34	Particle density (assumed)	
0.425	32	2.65	Mg/m3
0.3	30		
0.212	26		
0.15	24		
0.063	19		

Dry Mass of sample, g 903

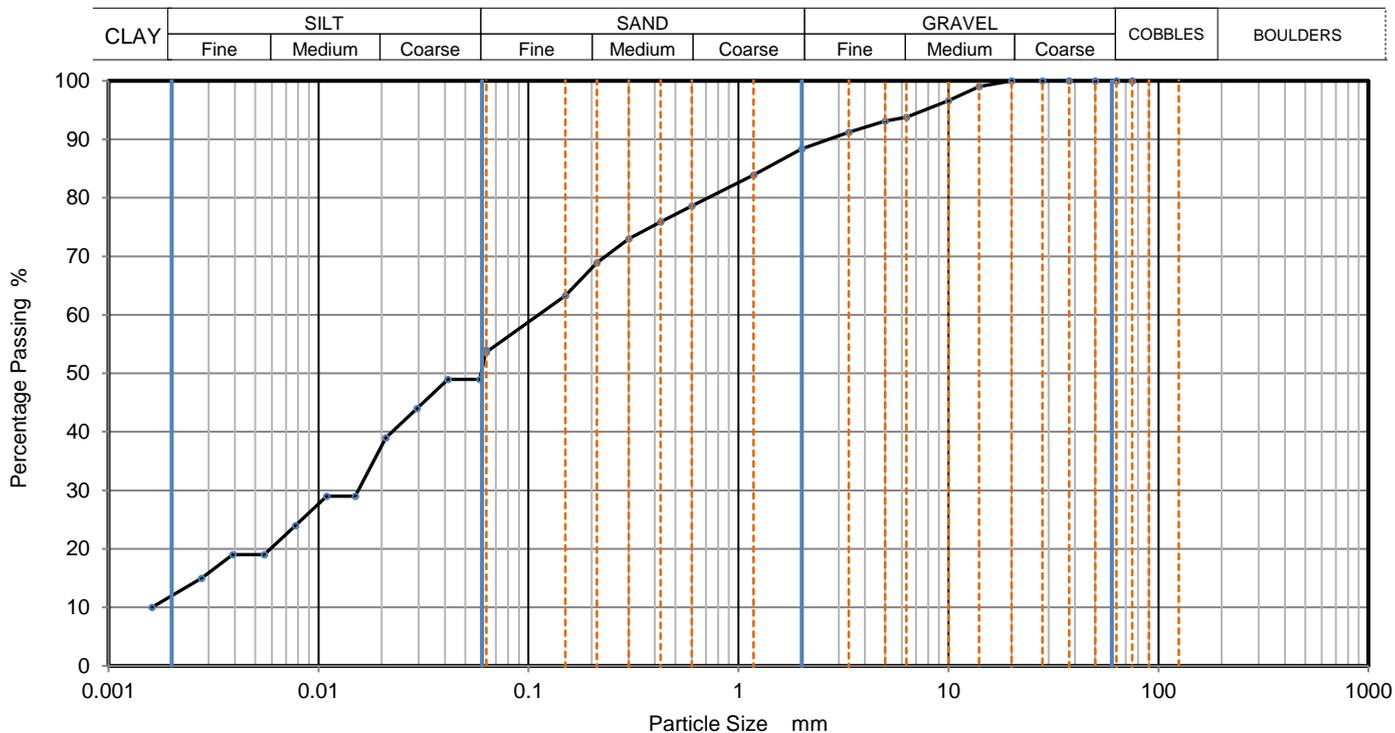
Sample Proportions	% dry mass
Very coarse	0
Gravel	58
Sand	24
Silt	15
Clay	4

Grading Analysis		
D100	mm	
D60	mm	18.5
D30	mm	0.316
D10	mm	0.00771
Uniformity Coefficient		2400
Curvature Coefficient		0.7

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP012	
Site Name	WSP Eastern & Midlands Region		Sample No.	5	
Soil Description	Brownish-grey slightly gravelly sandy SILT.		Depth, m	2.60	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021113020	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	54
		0.0586	49
75	100	0.0414	49
63	100	0.0294	44
50	100	0.0209	39
37.5	100	0.0150	29
28	100	0.0109	29
20	100	0.0078	24
14	99	0.0055	19
10	97	0.0039	19
6.3	94	0.0028	15
5	93	0.0016	10
3.35	91		
2	88		
1.18	84		
0.6	79	Particle density (assumed)	
0.425	76	2.65	Mg/m3
0.3	73		
0.212	69		
0.15	63		
0.063	54		

Dry Mass of sample, g

790

Sample Proportions	% dry mass
Very coarse	0
Gravel	12
Sand	35
Silt	42
Clay	12

Grading Analysis		
D100	mm	
D60	mm	0.111
D30	mm	0.0154
D10	mm	0.00166
Uniformity Coefficient		67
Curvature Coefficient		1.3

Remarks

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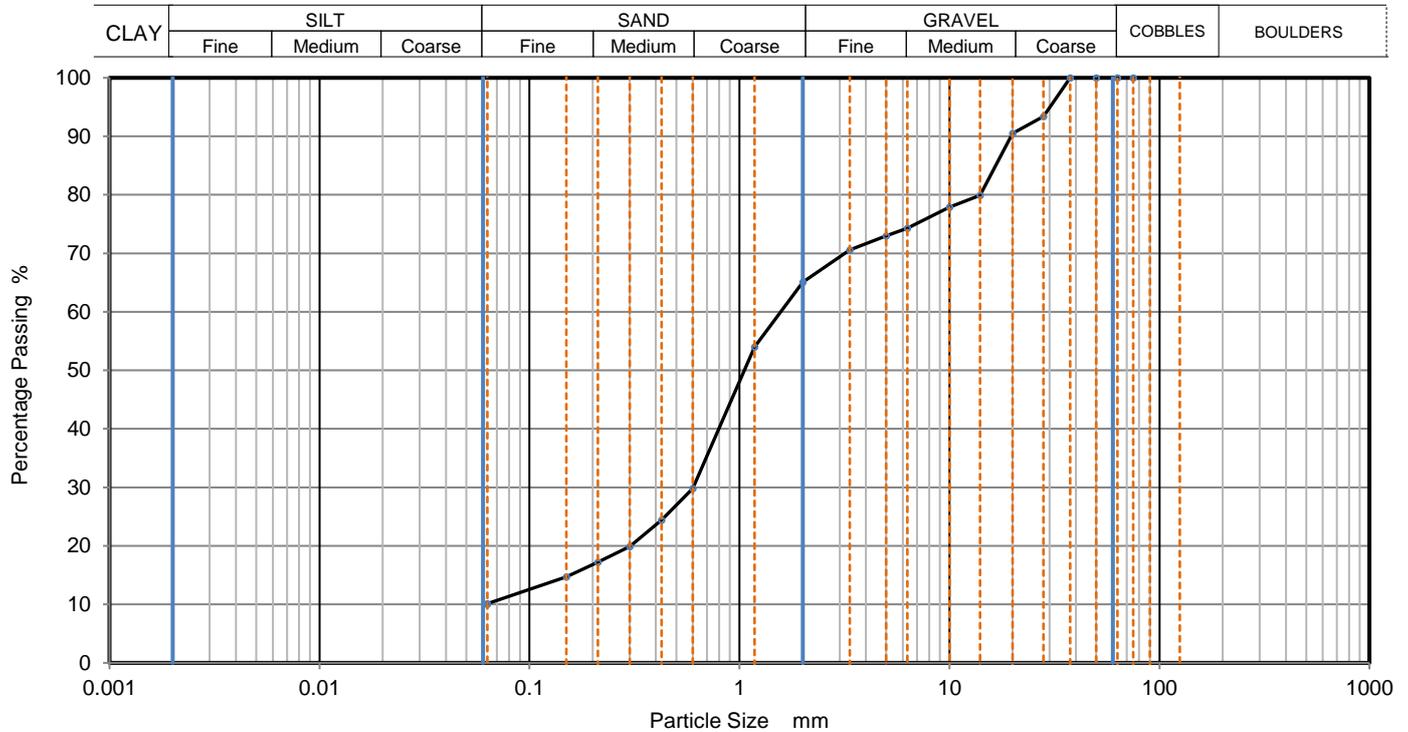
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP012
Sample No.	7
Depth, m	4.00
Sample Type	B
KeyLAB ID	IDL12021113022

Site Name	WSP Eastern & Midlands Region	
Soil Description	Grey silty very gravelly coarse SAND.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	10
75	100		
63	100		
50	100		
37.5	100		
28	93		
20	91		
14	80		
10	78		
6.3	74		
5	73		
3.35	71		
2	65		
1.18	54		
0.6	30	Particle density (assumed) 2.65 Mg/m ³	
0.425	24		
0.3	20		
0.212	17		
0.15	15		
0.063	10		

Dry Mass of sample, g 743

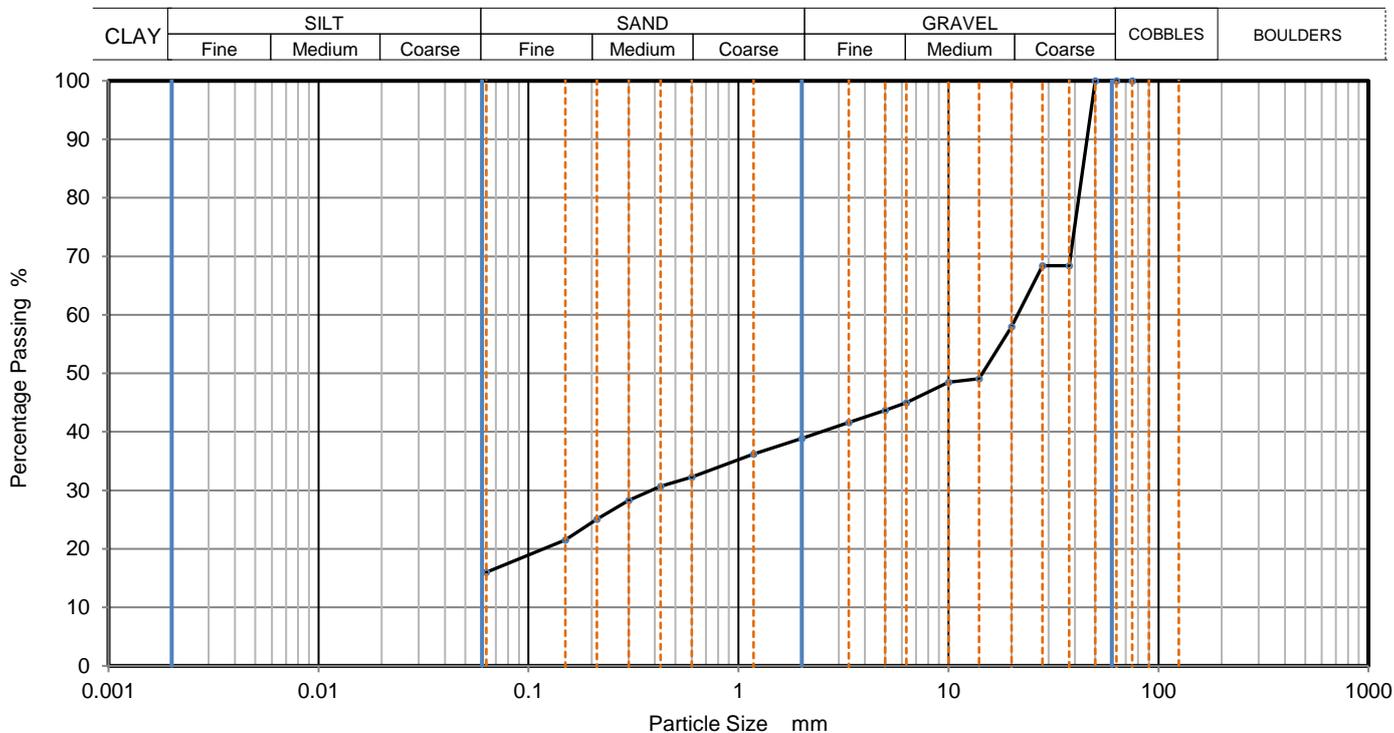
Sample Proportions	% dry mass
Very coarse	0
Gravel	35
Sand	55
Fines <0.063mm	10

Grading Analysis	
D100	mm
D60	mm 1.57
D30	mm 0.604
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP014	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Light brown silty very sandy coarse GRAVEL.		Depth, m	1.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL1202202044	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	68		
28	68		
20	58		
14	49		
10	49		
6.3	45		
5	44		
3.35	42		
2	39		
1.18	36		
0.6	32		
0.425	31		
0.3	28		
0.212	25		
0.15	22		
0.063	16		

Dry Mass of sample, g

858

Sample Proportions	% dry mass
Very coarse	0
Gravel	61
Sand	23
Fines <0.063mm	16

Grading Analysis		
D100	mm	
D60	mm	21.4
D30	mm	0.384
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

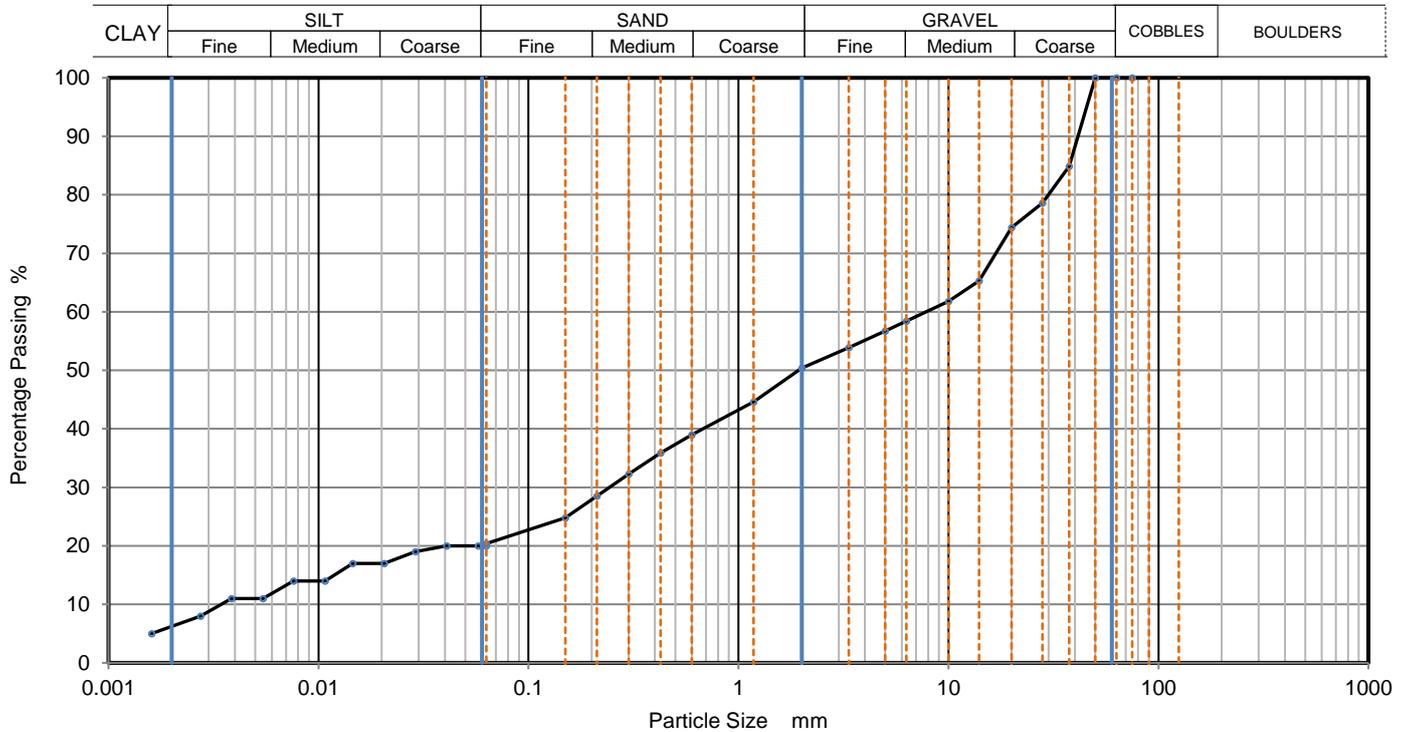
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP015
Sample No.	1
Depth, m	0.30
Sample Type	B
KeyLAB ID	IDL12021120752

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown very silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	20
		0.0576	20
75	100	0.0407	20
63	100	0.0290	19
50	100	0.0206	17
37.5	85	0.0146	17
28	79	0.0108	14
20	74	0.0076	14
14	65	0.0054	11
10	62	0.0038	11
6.3	58	0.0027	8
5	57	0.0016	5
3.35	54		
2	50		
1.18	45		
0.6	39	Particle density (assumed) 2.65 Mg/m ³	
0.425	36		
0.3	32		
0.212	29		
0.15	25		
0.063	20		

Dry Mass of sample, g 996

Sample Proportions	% dry mass
Very coarse	0
Gravel	50
Sand	30
Silt	14
Clay	6

Grading Analysis		
D100	mm	
D60	mm	7.82
D30	mm	0.244
D10	mm	0.00346
Uniformity Coefficient		2300
Curvature Coefficient		2.2

Remarks
Preparation and testing in accordance with BS1377 unless noted below

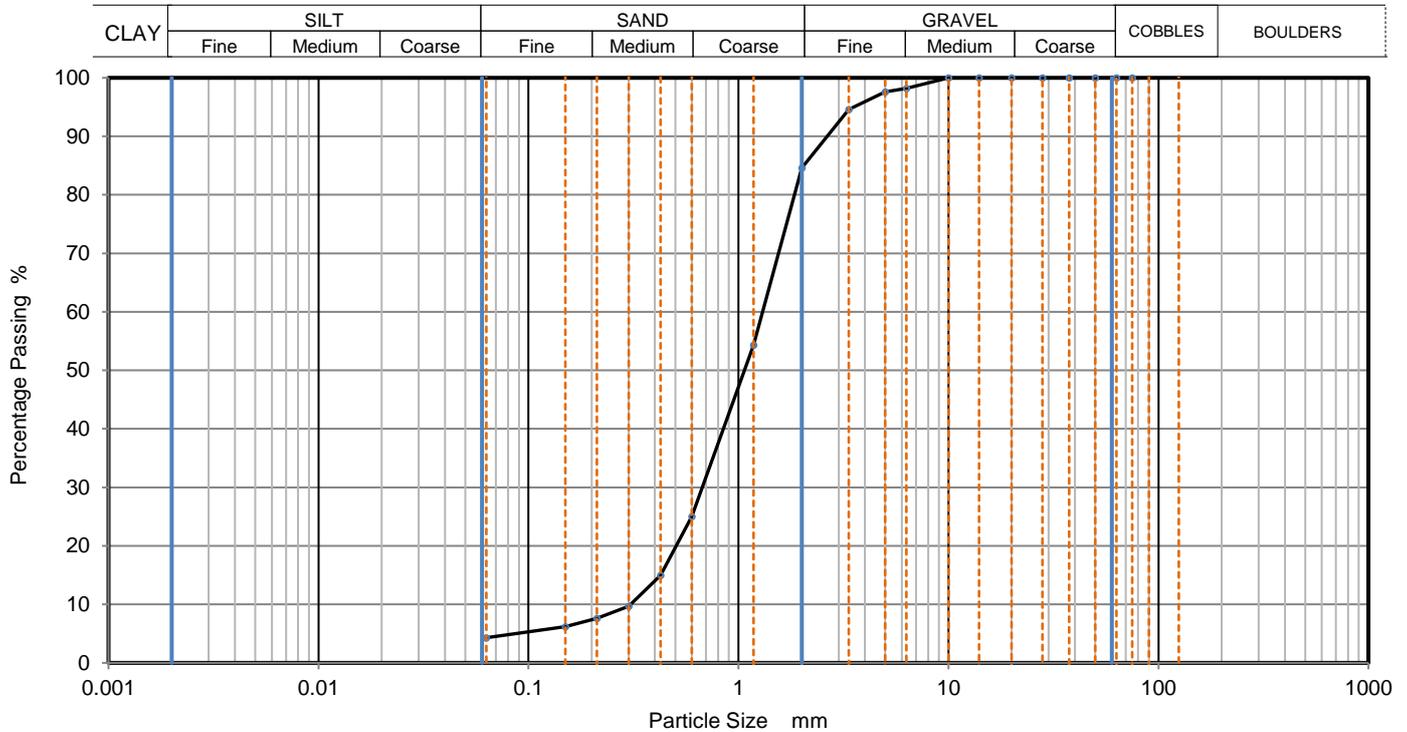
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP015
Sample No.	3
Depth, m	1.00
Sample Type	B
KeyLAB ID	IDL12021120755

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light grey slightly silty gravelly coarse SAND.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	98		
3.35	95		
2	85		
1.18	54		
0.6	25		
0.425	15	Particle density (assumed) 2.65 Mg/m ³	
0.3	10		
0.212	8		
0.15	6		
0.063	4		

Dry Mass of sample, g 715

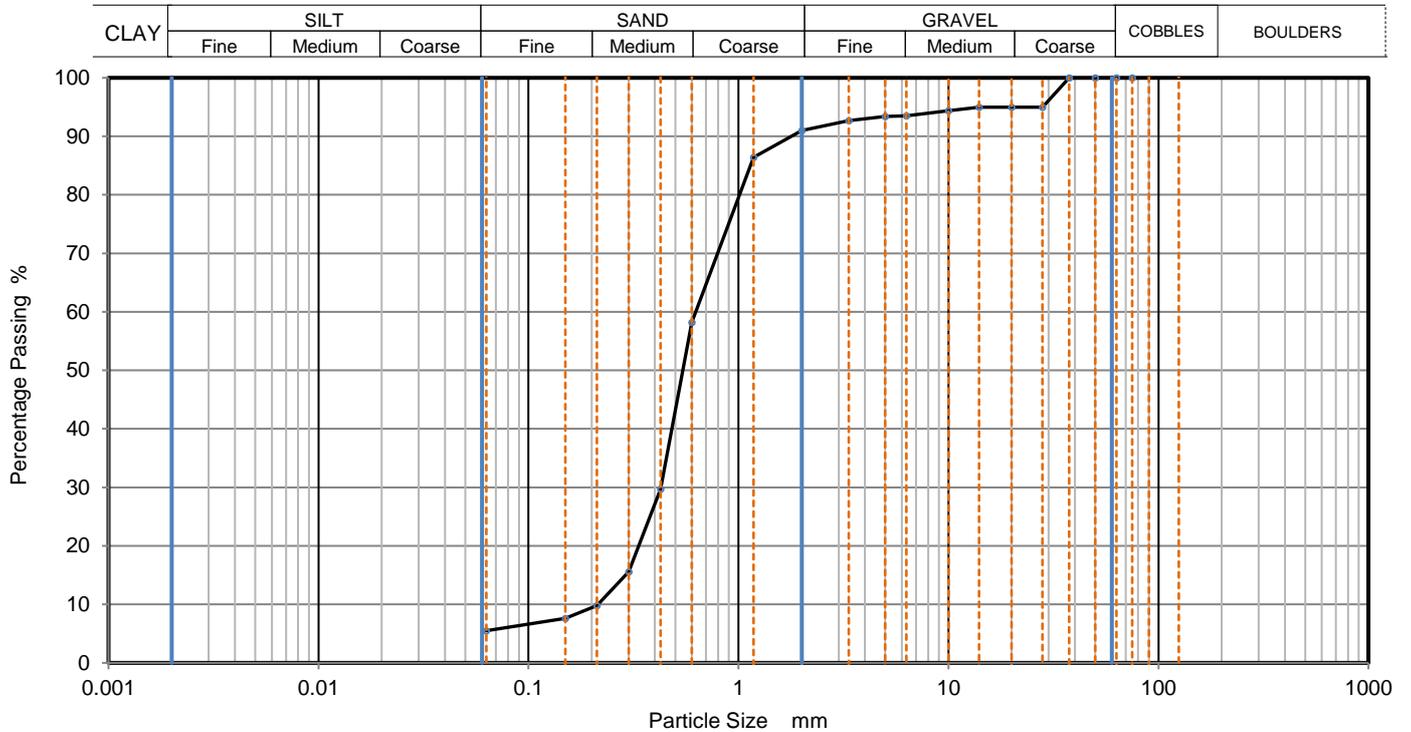
Sample Proportions	% dry mass
Very coarse	0
Gravel	15
Sand	80
Fines <0.063mm	4

Grading Analysis		
D100	mm	
D60	mm	1.3
D30	mm	0.673
D10	mm	0.305
Uniformity Coefficient		4.3
Curvature Coefficient		1.1

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP015	
Site Name	WSP Eastern & Midlands Region		Sample No.	4	
Soil Description	Light grey silty gravelly coarse and medium SAND.		Depth, m	2.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL12021120756	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	95		
14	95		
10	94		
6.3	94		
5	93		
3.35	93		
2	91		
1.18	86		
0.6	58	Particle density (assumed) 2.65 Mg/m ³	
0.425	30		
0.3	16		
0.212	10		
0.15	8		
0.063	6		

Dry Mass of sample, g 679

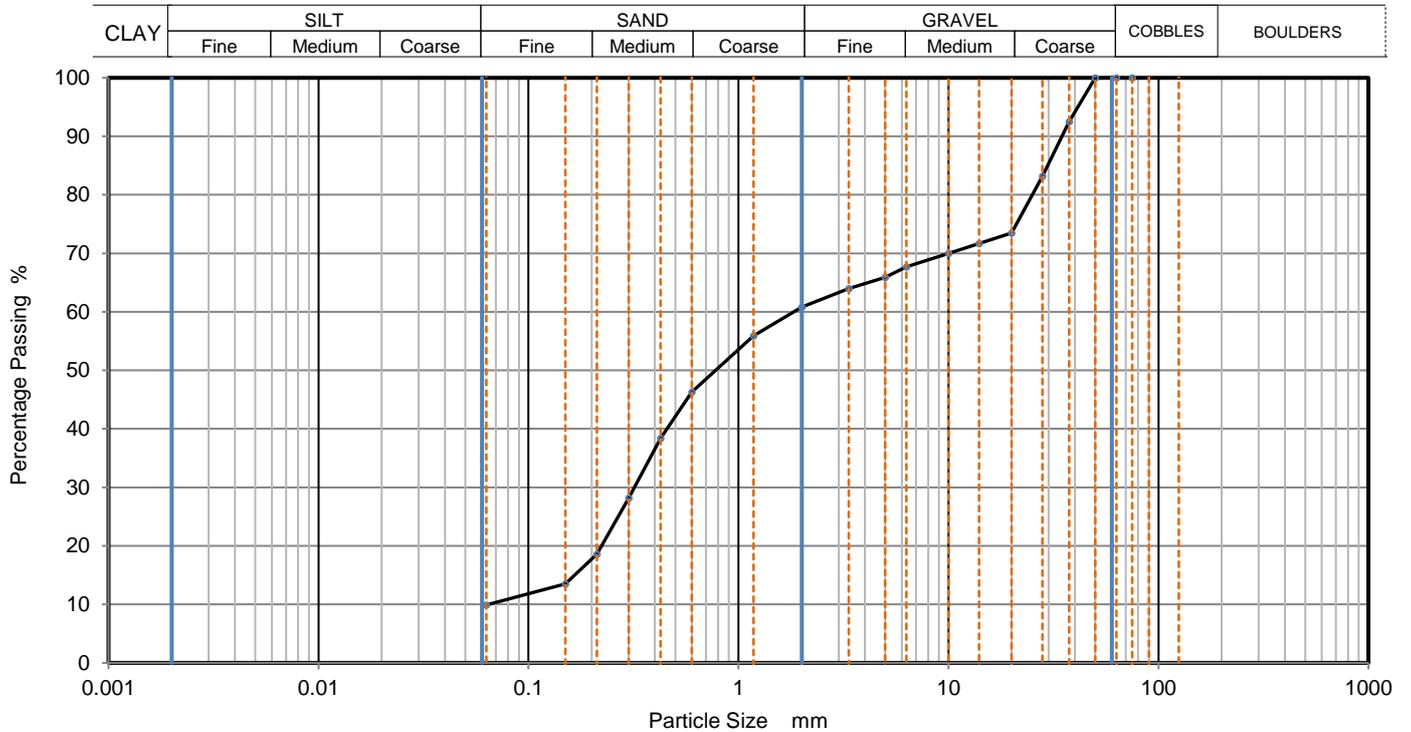
Sample Proportions	% dry mass
Very coarse	0
Gravel	9
Sand	86
Fines <0.063mm	5

Grading Analysis		
D100	mm	
D60	mm	0.626
D30	mm	0.426
D10	mm	0.215
Uniformity Coefficient		2.9
Curvature Coefficient		1.4

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP015	
Site Name	WSP Eastern & Midlands Region		Sample No.	7	
Soil Description	Light grey silty very gravelly medium SAND. Gravel is coarse.		Depth, m	3.70	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL12021120759	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	93		
28	83		
20	74		
14	72		
10	70		
6.3	68		
5	66		
3.35	64		
2	61		
1.18	56		
0.6	46		
0.425	38		
0.3	28		
0.212	19		
0.15	14		
0.063	10		

Dry Mass of sample, g 1147

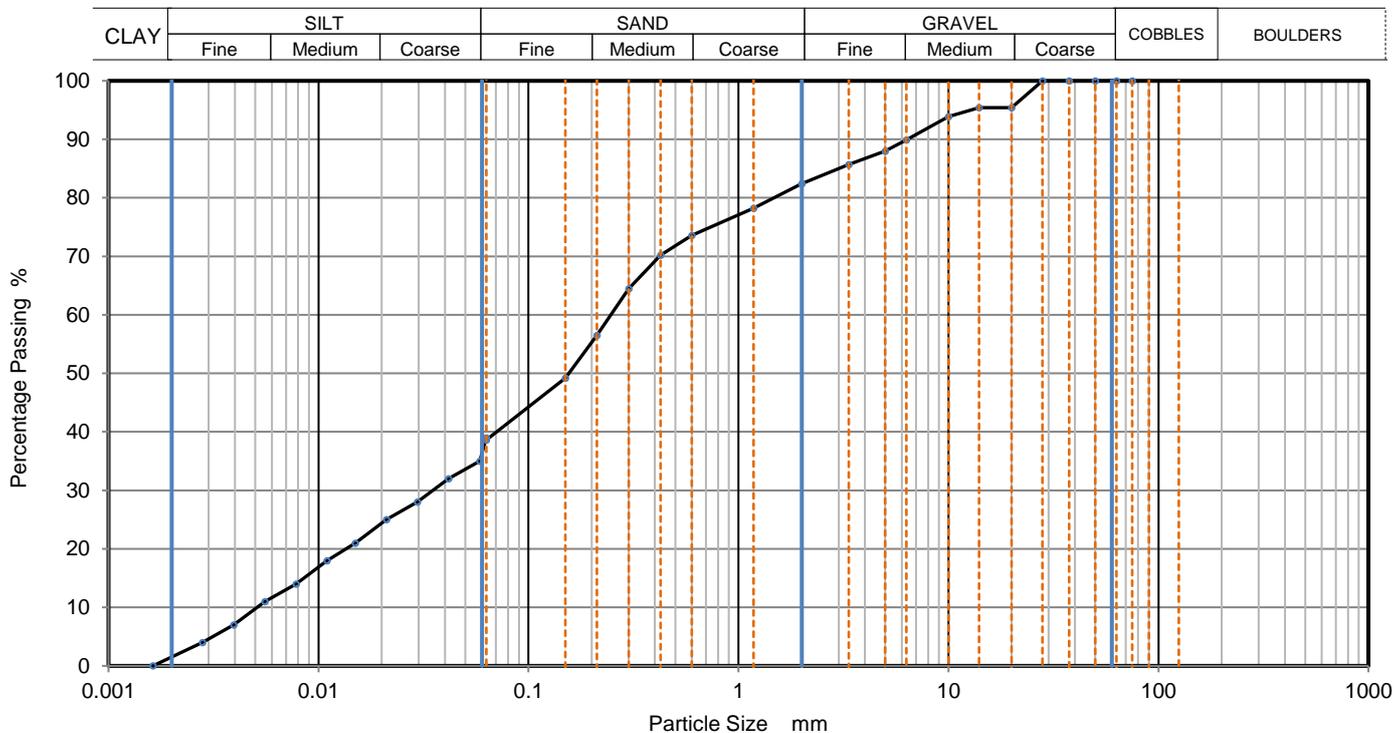
Sample Proportions	% dry mass
Very coarse	0
Gravel	39
Sand	51
Fines <0.063mm	10

Grading Analysis		
D100	mm	
D60	mm	1.83
D30	mm	0.319
D10	mm	0.0642
Uniformity Coefficient		28
Curvature Coefficient		0.87

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP016	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Orange-brown slightly gravelly sandy SILT.		Depth, m	0.40	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120760	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	39
		0.0586	35
75	100	0.0416	32
63	100	0.0296	28
50	100	0.0210	25
37.5	100	0.0150	21
28	100	0.0110	18
20	95	0.0078	14
14	95	0.0055	11
10	94	0.0039	7
6.3	90	0.0028	4
5	88	0.0016	0
3.35	86		
2	82		
1.18	78		
0.6	74	Particle density (assumed)	
0.425	70	2.65	Mg/m ³
0.3	65		
0.212	57		
0.15	49		
0.063	39		

Dry Mass of sample, g

719

Sample Proportions	% dry mass
Very coarse	0
Gravel	18
Sand	44
Silt	37
Clay	1

Grading Analysis		
D100	mm	
D60	mm	0.247
D30	mm	0.0357
D10	mm	0.00527
Uniformity Coefficient		47
Curvature Coefficient		0.98

Remarks

Preparation and testing in accordance with BS1377 unless noted below

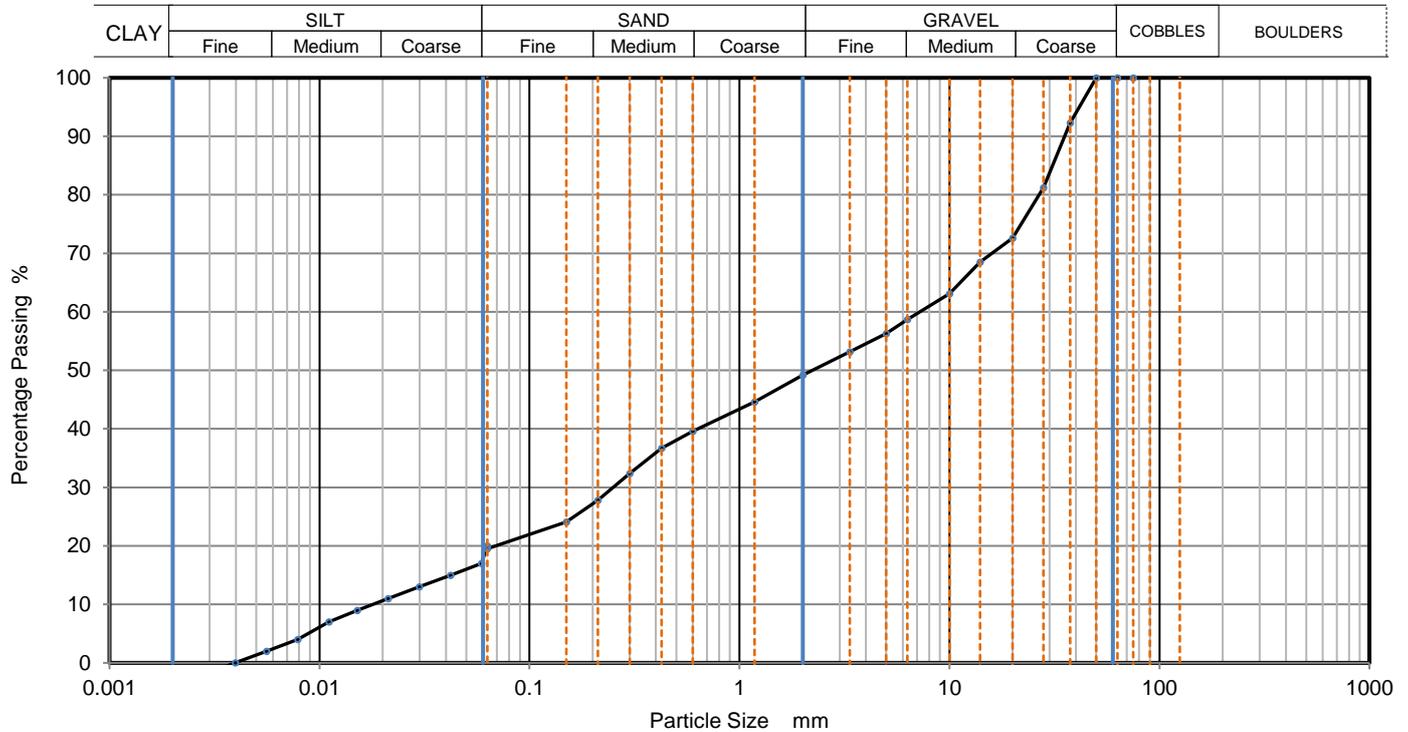
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP016
Sample No.	3
Depth, m	1.20
Sample Type	B
KeyLAB ID	IDL12021120763

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	20
		0.0591	17
75	100	0.0420	15
63	100	0.0299	13
50	100	0.0212	11
37.5	92	0.0151	9
28	81	0.0111	7
20	73	0.0079	4
14	69	0.0056	2
10	63	0.0040	0
6.3	59	0.0028	-2
5	56	0.0016	-2
3.35	53		
2	49		
1.18	45		
0.6	40	Particle density (assumed) 2.65 Mg/m ³	
0.425	37		
0.3	32		
0.212	28		
0.15	24		
0.063	20		

Dry Mass of sample, g 1102

Sample Proportions	% dry mass
Very coarse	0
Gravel	51
Sand	30
Silt	22
Clay	-2

Grading Analysis		
D100	mm	
D60	mm	7.24
D30	mm	0.25
D10	mm	0.0186
Uniformity Coefficient		390
Curvature Coefficient		0.46

Remarks
Preparation and testing in accordance with BS1377 unless noted below

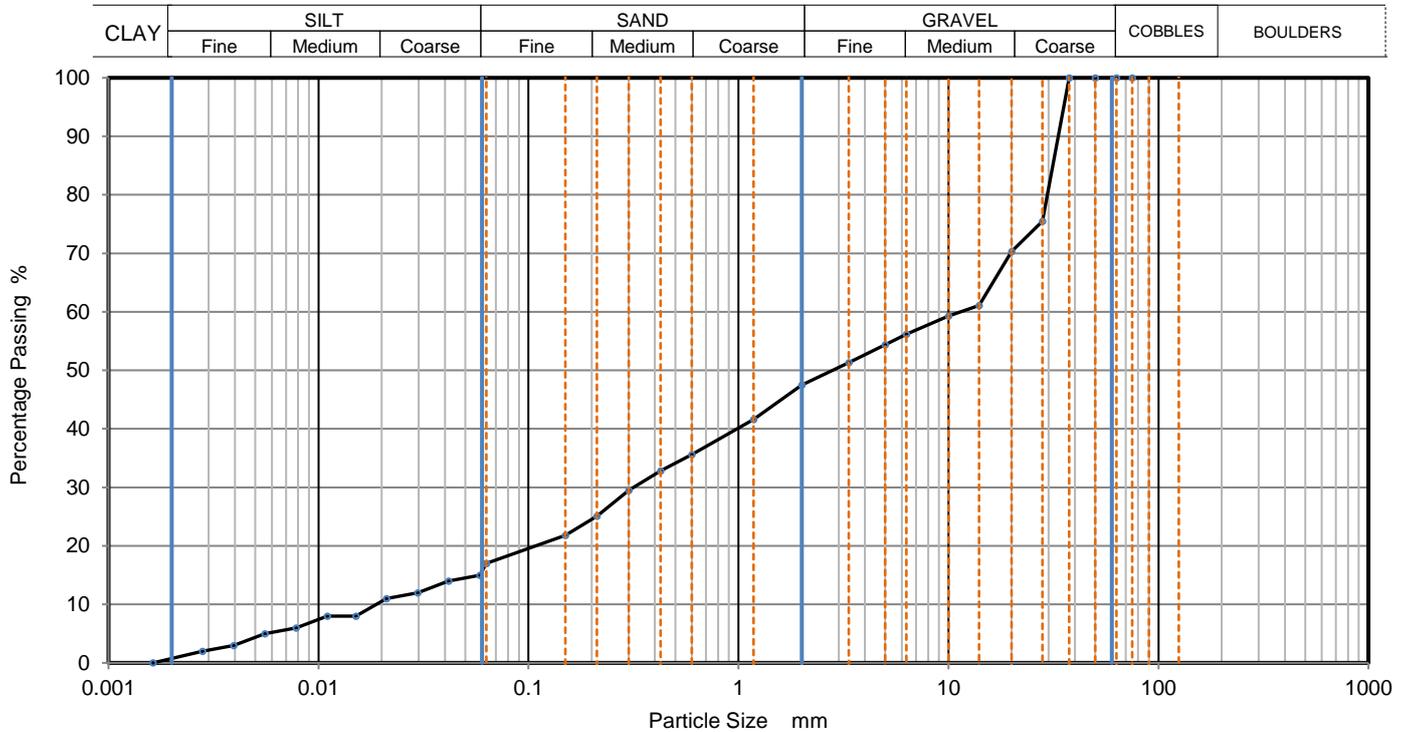
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP016
Sample No.	5
Depth, m	2.20
Sample Type	B
KeyLAB ID	IDL12021120765

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown silty very sandy coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	17
		0.0586	15
75	100	0.0417	14
63	100	0.0296	12
50	100	0.0211	11
37.5	100	0.0151	8
28	76	0.0110	8
20	70	0.0078	6
14	61	0.0056	5
10	59	0.0039	3
6.3	56	0.0028	2
5	54	0.0016	0
3.35	51		
2	48		
1.18	42		
0.6	36	Particle density (assumed) 2.65 Mg/m ³	
0.425	33		
0.3	30		
0.212	25		
0.15	22		
0.063	17		

Dry Mass of sample, g 1014

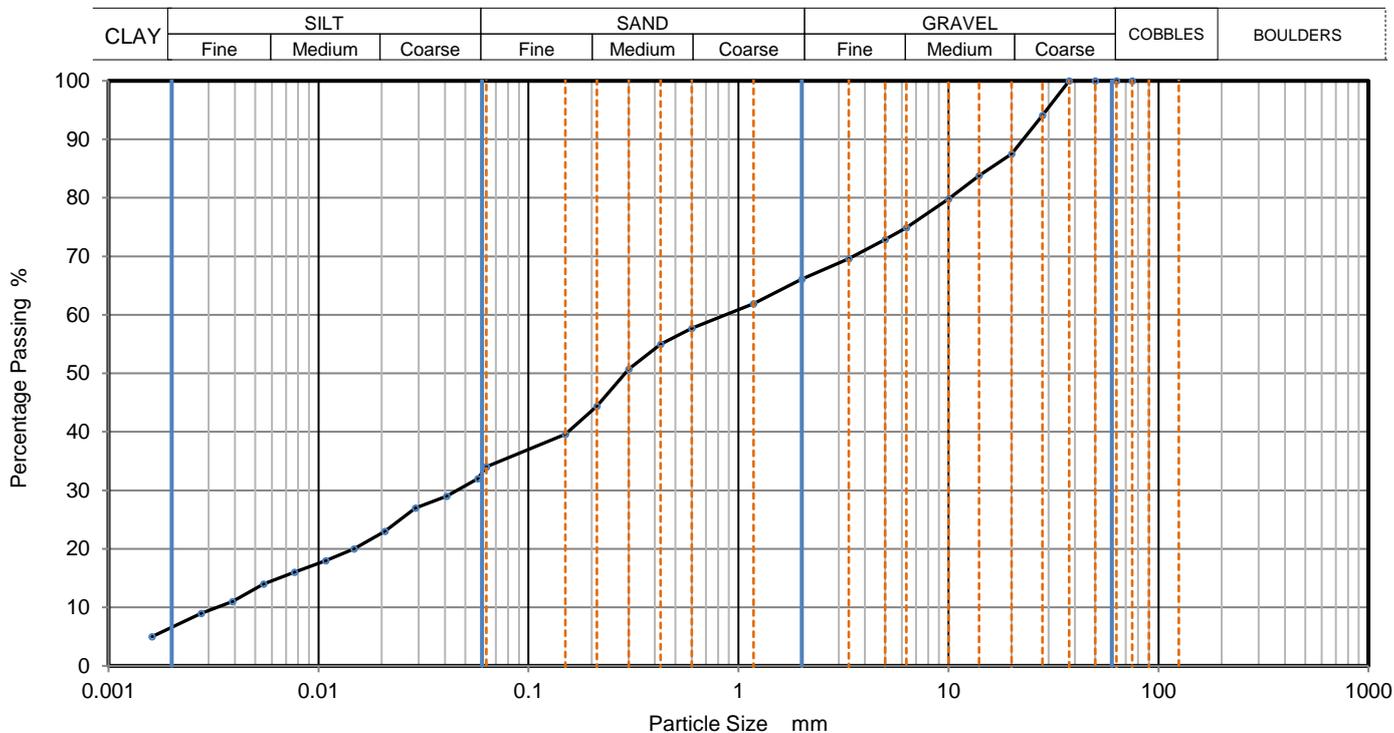
Sample Proportions	% dry mass
Very coarse	0
Gravel	53
Sand	31
Silt	16
Clay	1

Grading Analysis		
D100	mm	
D60	mm	11.4
D30	mm	0.316
D10	mm	0.0193
Uniformity Coefficient		590
Curvature Coefficient		0.45

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP016	
Site Name	WSP Eastern & Midlands Region		Sample No.	7	
Soil Description	Brown very silty SAND and GRAVEL.		Depth, m	3.80	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120767	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	34
		0.0573	32
75	100	0.0408	29
63	100	0.0290	27
50	100	0.0207	23
37.5	100	0.0147	20
28	94	0.0108	18
20	88	0.0077	16
14	84	0.0055	14
10	80	0.0039	11
6.3	75	0.0028	9
5	73	0.0016	5
3.35	70		
2	66		
1.18	62		
0.6	58	Particle density (assumed)	
0.425	55	2.65	Mg/m3
0.3	51		
0.212	44		
0.15	40		
0.063	34		

Dry Mass of sample, g

1420

Sample Proportions	% dry mass
Very coarse	0
Gravel	34
Sand	32
Silt	28
Clay	6

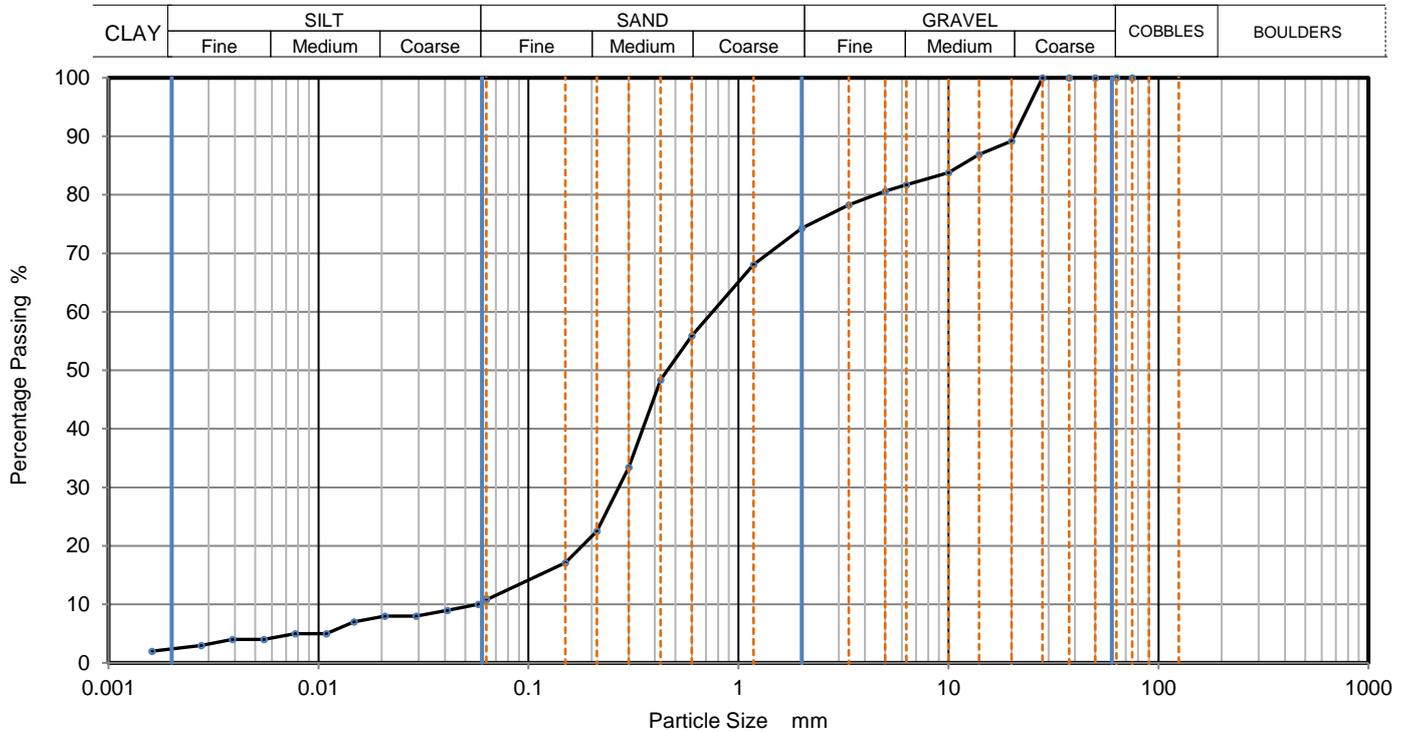
Grading Analysis		
D100	mm	
D60	mm	0.871
D30	mm	0.0442
D10	mm	0.00318
Uniformity Coefficient		270
Curvature Coefficient		0.7

Remarks

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP017	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Orange-brown silty very gravelly medium SAND.		Depth, m	0.30	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120769	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	11
		0.0577	10
75	100	0.0410	9
63	100	0.0292	8
50	100	0.0207	8
37.5	100	0.0147	7
28	100	0.0109	5
20	89	0.0077	5
14	87	0.0055	4
10	84	0.0039	4
6.3	82	0.0028	3
5	81	0.0016	2
3.35	78		
2	74		
1.18	68		
0.6	56	Particle density (assumed)	
0.425	48	2.65	Mg/m ³
0.3	33		
0.212	23		
0.15	17		
0.063	11		

Dry Mass of sample, g 497

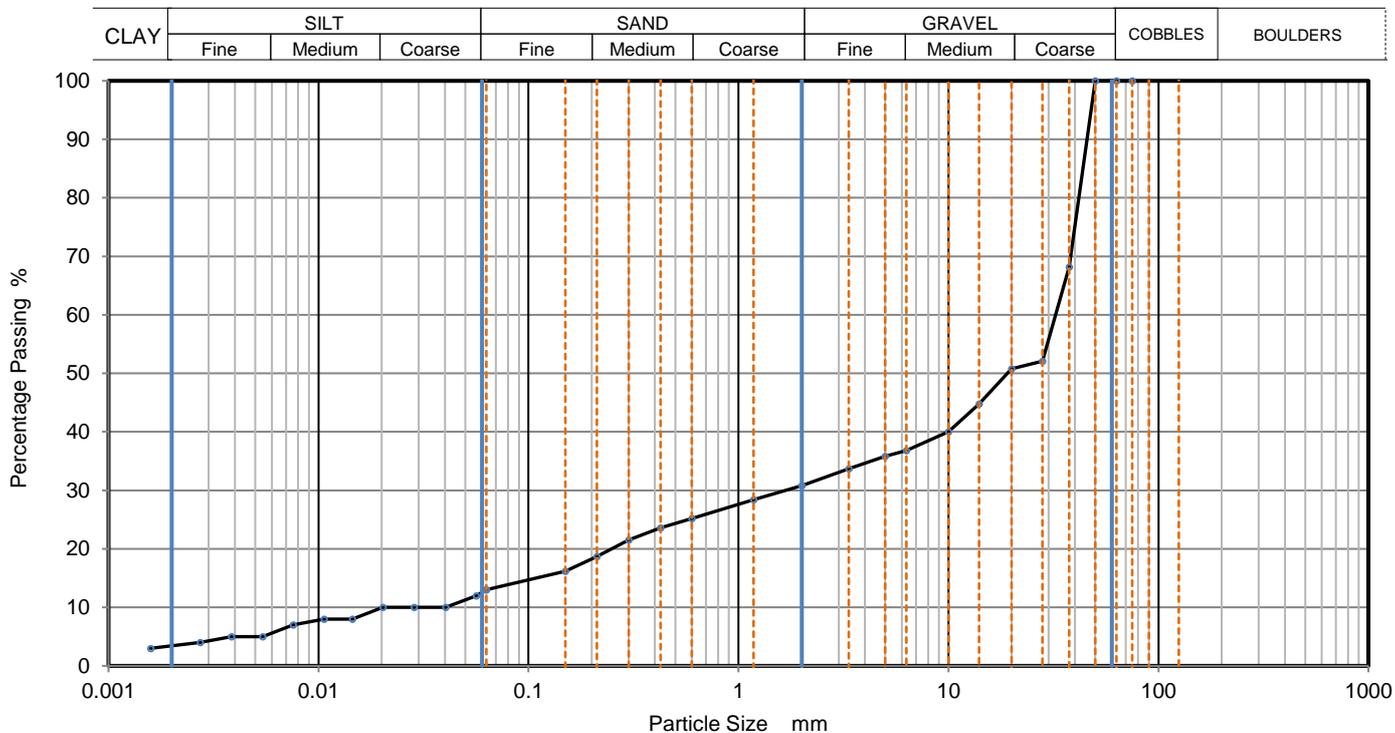
Sample Proportions	% dry mass
Very coarse	0
Gravel	26
Sand	63
Silt	9
Clay	2

Grading Analysis		
D100	mm	
D60	mm	0.753
D30	mm	0.269
D10	mm	0.0569
Uniformity Coefficient		13
Curvature Coefficient		1.7

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP017	
Site Name	WSP Eastern & Midlands Region		Sample No.	5	
Soil Description	Brown silty sandy coarse GRAVEL.		Depth, m	2.30	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120774	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	13
		0.0563	12
75	100	0.0403	10
63	100	0.0285	10
50	100	0.0203	10
37.5	68	0.0145	8
28	52	0.0106	8
20	51	0.0076	7
14	45	0.0054	5
10	40	0.0038	5
6.3	37	0.0027	4
5	36	0.0016	3
3.35	34		
2	31		
1.18	28		
0.6	25	Particle density (assumed)	
0.425	24	2.65	Mg/m ³
0.3	22		
0.212	19		
0.15	16		
0.063	13		

Dry Mass of sample, g

1089

Sample Proportions	% dry mass
Very coarse	0
Gravel	69
Sand	18
Silt	9
Clay	4

Grading Analysis		
D100	mm	
D60	mm	32.3
D30	mm	1.67
D10	mm	0.025
Uniformity Coefficient		1300
Curvature Coefficient		3.4

Remarks

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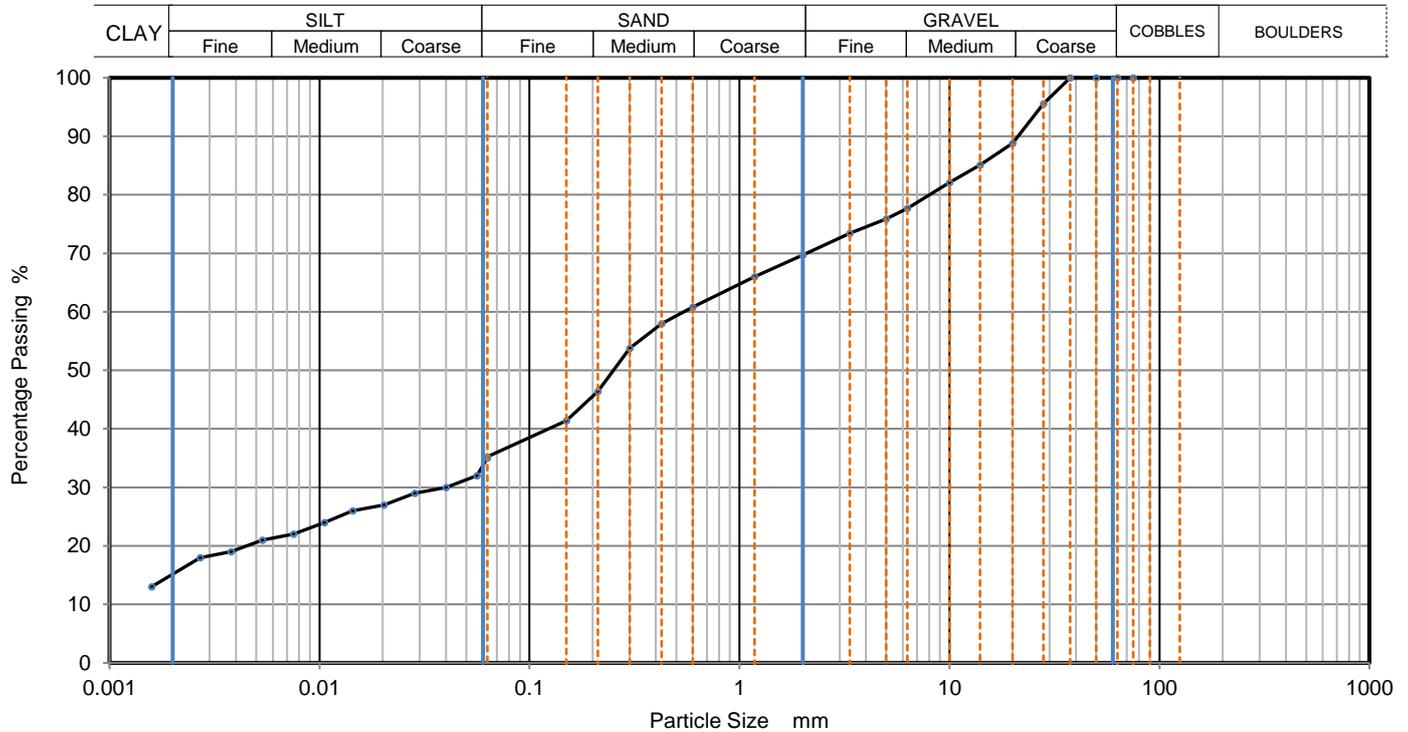
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP017
Sample No.	7
Depth, m	3.50
Sample Type	B
KeyLAB ID	IDL12021120776

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	35
		0.0562	32
75	100	0.0400	30
63	100	0.0285	29
50	100	0.0202	27
37.5	100	0.0144	26
28	96	0.0106	24
20	89	0.0075	22
14	85	0.0053	21
10	82	0.0038	19
6.3	78	0.0027	18
5	76	0.0016	13
3.35	73		
2	70		
1.18	66		
0.6	61	Particle density (assumed) 2.65 Mg/m ³	
0.425	58		
0.3	54		
0.212	46		
0.15	41		
0.063	35		

Dry Mass of sample, g 872

Sample Proportions	% dry mass
Very coarse	0
Gravel	30
Sand	35
Silt	20
Clay	15

Grading Analysis		
D100	mm	
D60	mm	0.542
D30	mm	0.0367
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

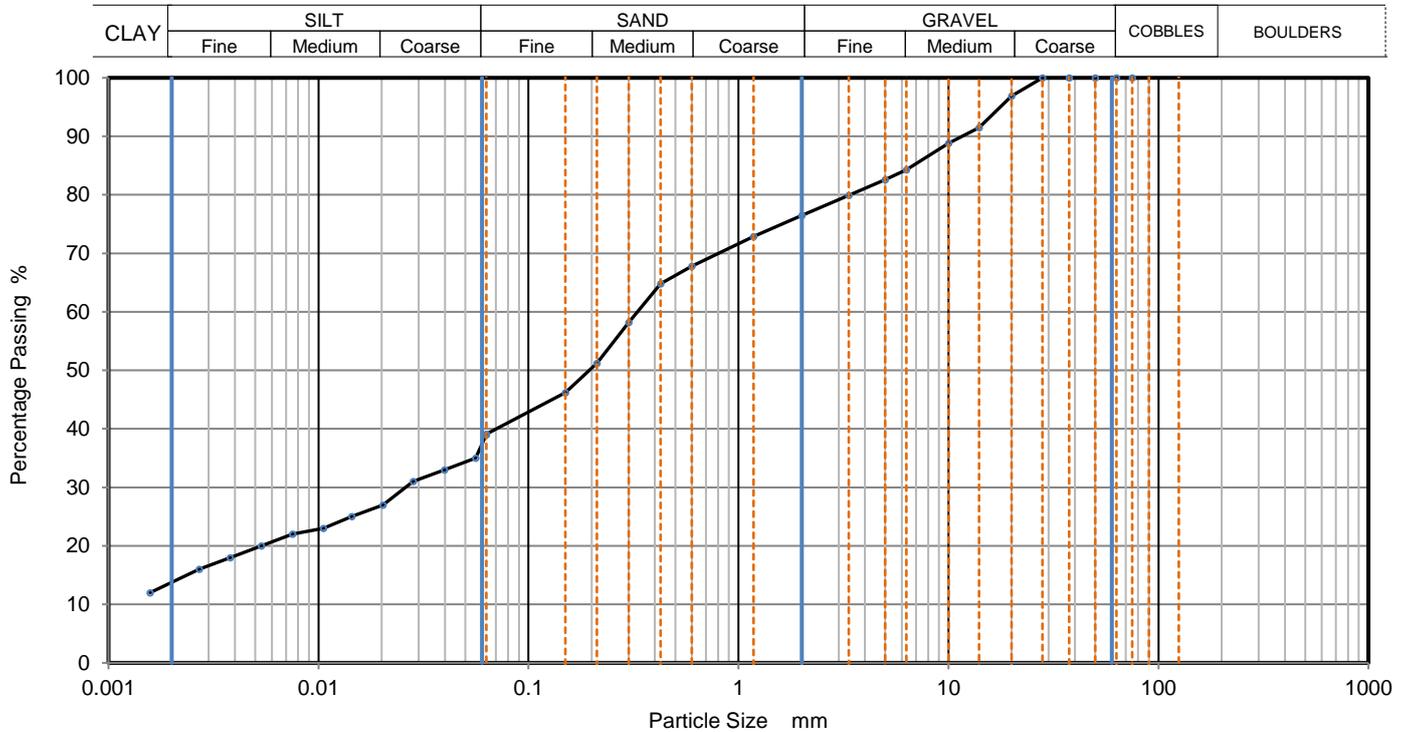
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP018
Sample No.	1
Depth, m	0.30
Sample Type	B
KeyLAB ID	IDL12021120778

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orange-brown slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	39
		0.0559	35
75	100	0.0398	33
63	100	0.0283	31
50	100	0.0202	27
37.5	100	0.0144	25
28	100	0.0106	23
20	97	0.0075	22
14	92	0.0053	20
10	89	0.0038	18
6.3	84	0.0027	16
5	83	0.0016	12
3.35	80		
2	77		
1.18	73		
0.6	68	Particle density (assumed) 2.65 Mg/m ³	
0.425	65		
0.3	58		
0.212	51		
0.15	46		
0.063	39		

Dry Mass of sample, g 761

Sample Proportions	% dry mass
Very coarse	0
Gravel	24
Sand	37
Silt	26
Clay	14

Grading Analysis	
D100	mm
D60	mm 0.33
D30	mm 0.0254
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below

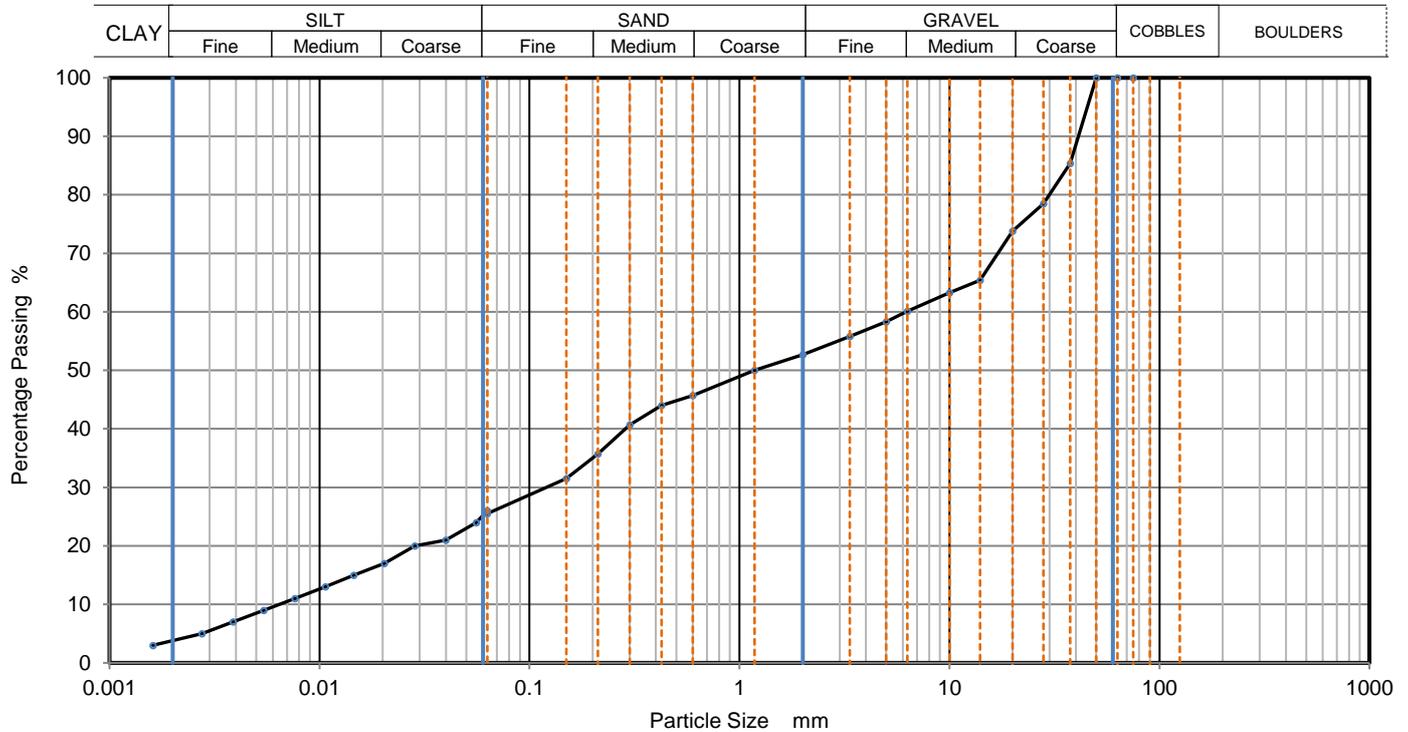
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP018
Sample No.	5
Depth, m	2.40
Sample Type	B
KeyLAB ID	IDL12021120783

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	26
		0.0558	24
75	100	0.0400	21
63	100	0.0284	20
50	100	0.0203	17
37.5	85	0.0145	15
28	79	0.0107	13
20	74	0.0076	11
14	65	0.0054	9
10	63	0.0039	7
6.3	60	0.0028	5
5	58	0.0016	3
3.35	56		
2	53		
1.18	50		
0.6	46	Particle density (assumed) 2.65 Mg/m ³	
0.425	44		
0.3	41		
0.212	36		
0.15	32		
0.063	26		

Dry Mass of sample, g 850

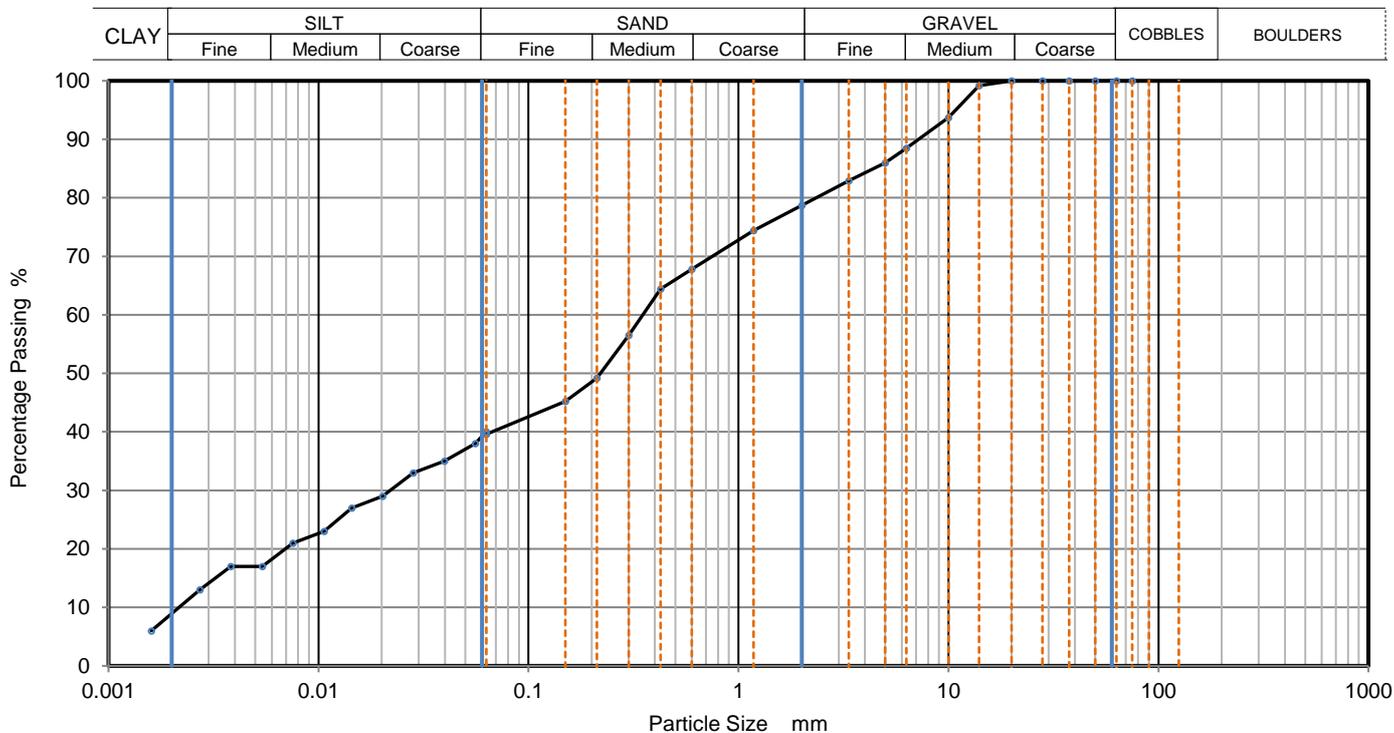
Sample Proportions	% dry mass
Very coarse	0
Gravel	47
Sand	27
Silt	22
Clay	4

Grading Analysis		
D100	mm	
D60	mm	6.21
D30	mm	0.121
D10	mm	0.00633
Uniformity Coefficient		980
Curvature Coefficient		0.37

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP018	
Site Name	WSP Eastern & Midlands Region		Sample No.	7	
Soil Description	Light brown slightly gravelly sandy SILT.		Depth, m	3.50	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120785	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	40
		0.0558	38
75	100	0.0397	35
63	100	0.0283	33
50	100	0.0202	29
37.5	100	0.0144	27
28	100	0.0106	23
20	100	0.0076	21
14	99	0.0054	17
10	94	0.0038	17
6.3	89	0.0027	13
5	86	0.0016	6
3.35	83		
2	79		
1.18	74		
0.6	68	Particle density (assumed)	
0.425	64	2.65	Mg/m ³
0.3	57		
0.212	49		
0.15	45		
0.063	40		

Dry Mass of sample, g

1139

Sample Proportions	% dry mass
Very coarse	0
Gravel	21
Sand	39
Silt	31
Clay	9

Grading Analysis		
D100	mm	
D60	mm	0.351
D30	mm	0.0216
D10	mm	0.0022
Uniformity Coefficient		160
Curvature Coefficient		0.6

Remarks

Preparation and testing in accordance with BS1377 unless noted below

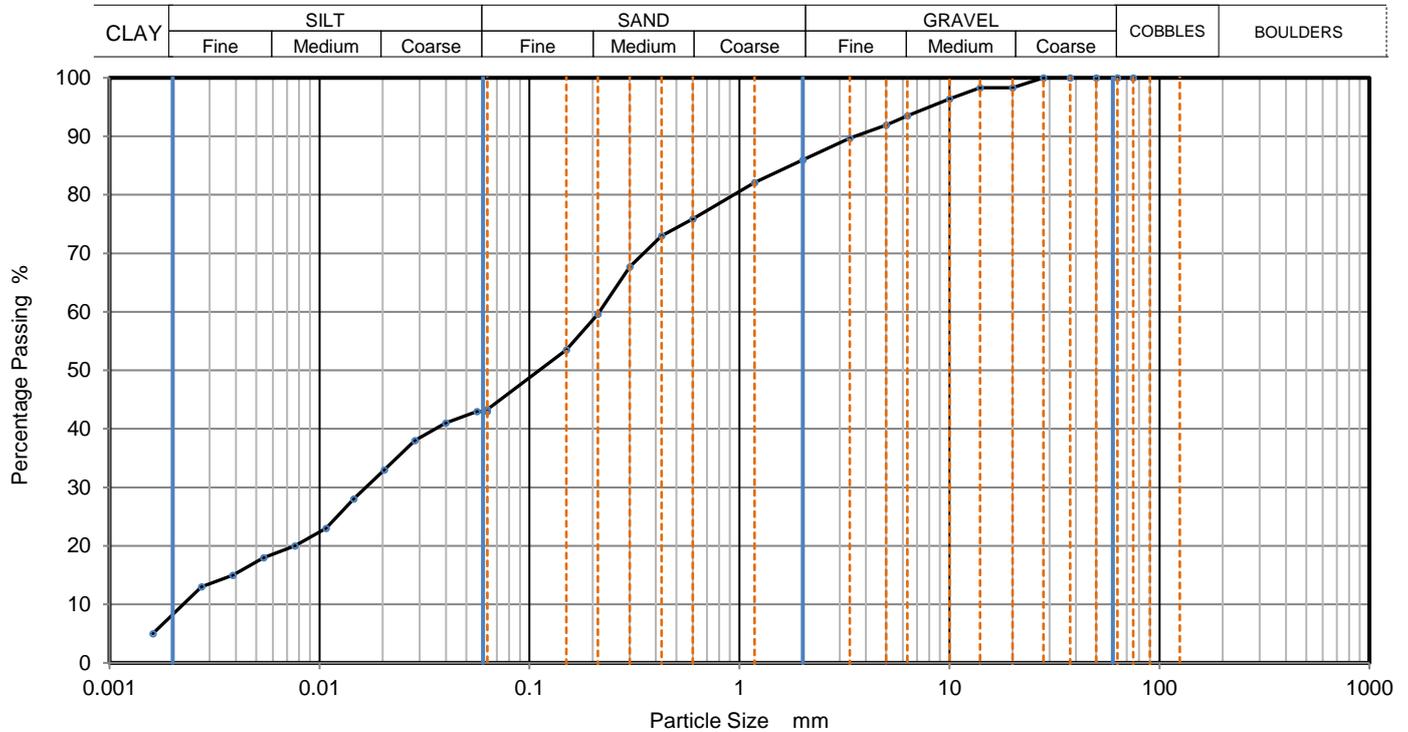
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP019
Sample No.	1
Depth, m	0.30
Sample Type	B
KeyLAB ID	IDL12021120787

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orange-brown slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	43
		0.0562	43
75	100	0.0400	41
63	100	0.0284	38
50	100	0.0203	33
37.5	100	0.0145	28
28	100	0.0107	23
20	98	0.0076	20
14	98	0.0054	18
10	96	0.0039	15
6.3	94	0.0027	13
5	92	0.0016	5
3.35	90		
2	86		
1.18	82		
0.6	76	Particle density (assumed) 2.65 Mg/m ³	
0.425	73		
0.3	68		
0.212	60		
0.15	54		
0.063	43		

Dry Mass of sample, g 1130

Sample Proportions	% dry mass
Very coarse	0
Gravel	14
Sand	43
Silt	35
Clay	8

Grading Analysis		
D100	mm	
D60	mm	0.215
D30	mm	0.0166
D10	mm	0.00227
Uniformity Coefficient		95
Curvature Coefficient		0.56

Remarks
Preparation and testing in accordance with BS1377 unless noted below

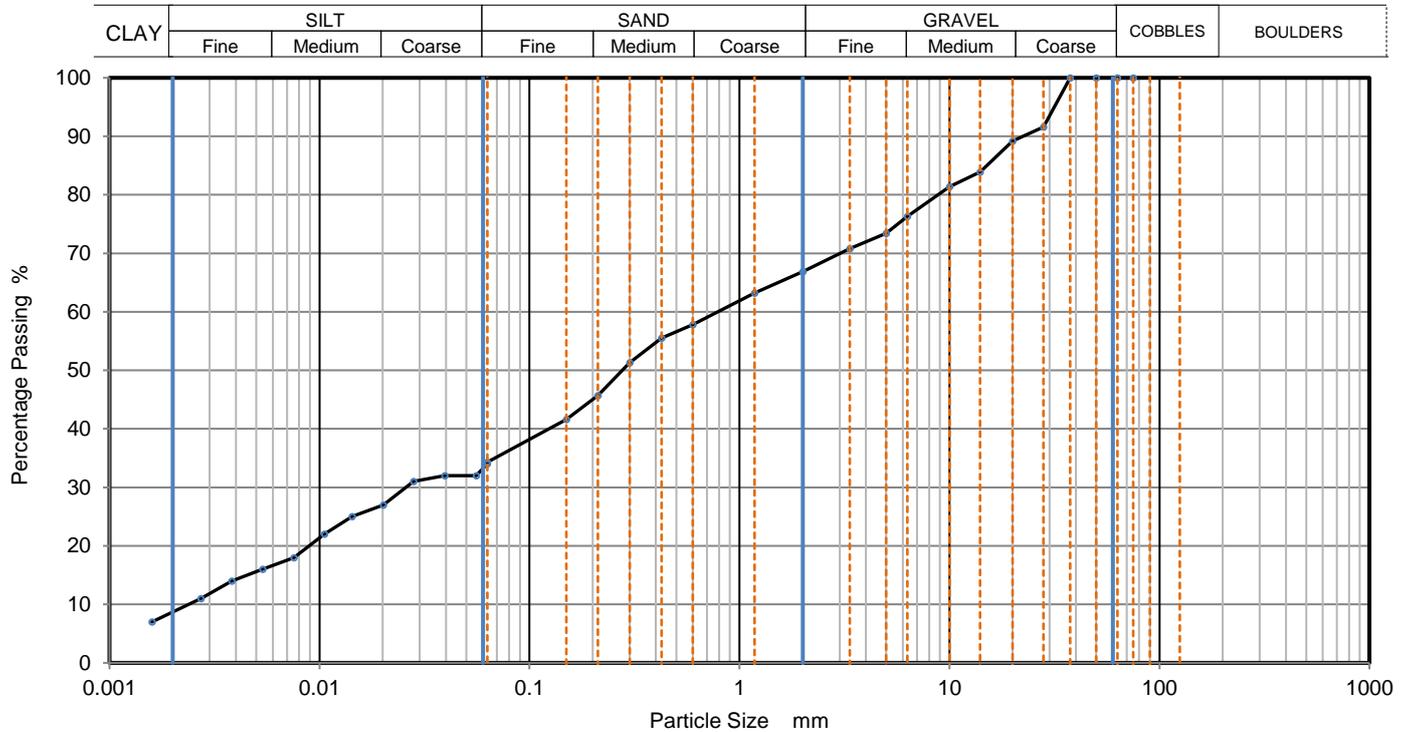
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP019
Sample No.	3
Depth, m	1.30
Sample Type	B
KeyLAB ID	IDL12021120790

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	34
		0.0558	32
75	100	0.0395	32
63	100	0.0281	31
50	100	0.0201	27
37.5	100	0.0143	25
28	92	0.0106	22
20	89	0.0076	18
14	84	0.0054	16
10	81	0.0038	14
6.3	76	0.0027	11
5	73	0.0016	7
3.35	71		
2	67		
1.18	63		
0.6	58	Particle density (assumed) 2.65 Mg/m ³	
0.425	56		
0.3	51		
0.212	46		
0.15	42		
0.063	34		

Dry Mass of sample, g 821

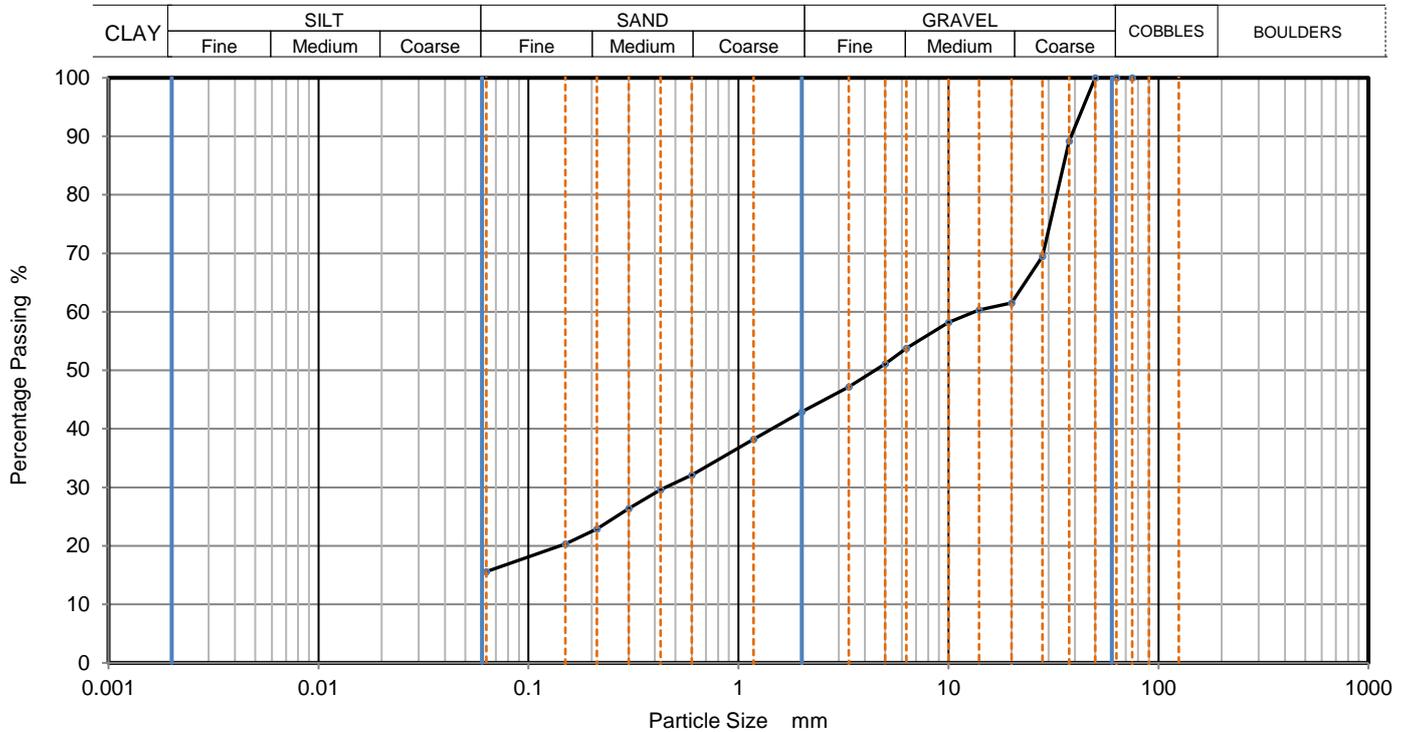
Sample Proportions	% dry mass
Very coarse	0
Gravel	33
Sand	33
Silt	26
Clay	9

Grading Analysis		
D100	mm	
D60	mm	0.79
D30	mm	0.0264
D10	mm	0.00241
Uniformity Coefficient		330
Curvature Coefficient		0.36

Remarks
Preparation and testing in accordance with BS1377 unless noted below

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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP020	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Brown silty very sandy coarse GRAVEL.		Depth, m	1.00	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clause 9.2		KeyLAB ID	IDL1202202048	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	89		
28	70		
20	62		
14	60		
10	58		
6.3	54		
5	51		
3.35	47		
2	43		
1.18	38		
0.6	32		
0.425	30		
0.3	26		
0.212	23		
0.15	20		
0.063	16		

Dry Mass of sample, g 902

Sample Proportions	% dry mass
Very coarse	0
Gravel	57
Sand	27
Fines <0.063mm	16

Grading Analysis		
D100	mm	
D60	mm	13.2
D30	mm	0.449
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

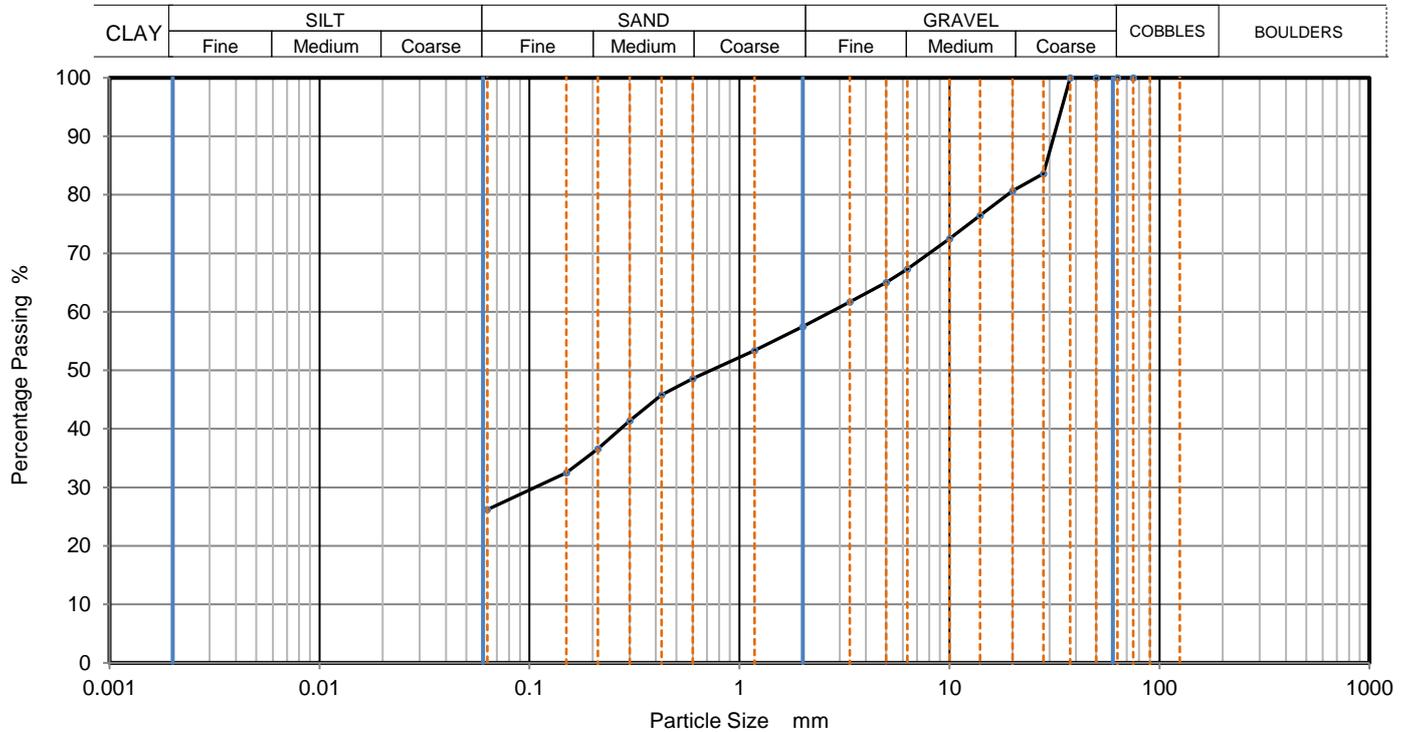
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP020
Sample No.	3
Depth, m	2.50
Sample Type	B
KeyLAB ID	IDL12022020410

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very silty very sandy GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	84		
20	81		
14	77		
10	73		
6.3	67		
5	65		
3.35	62		
2	58		
1.18	53		
0.6	49		
0.425	46		
0.3	41		
0.212	37		
0.15	33		
0.063	26		

Dry Mass of sample, g 909

Sample Proportions	% dry mass
Very coarse	0
Gravel	43
Sand	31
Fines <0.063mm	26

Grading Analysis		
D100	mm	
D60	mm	2.72
D30	mm	0.107
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

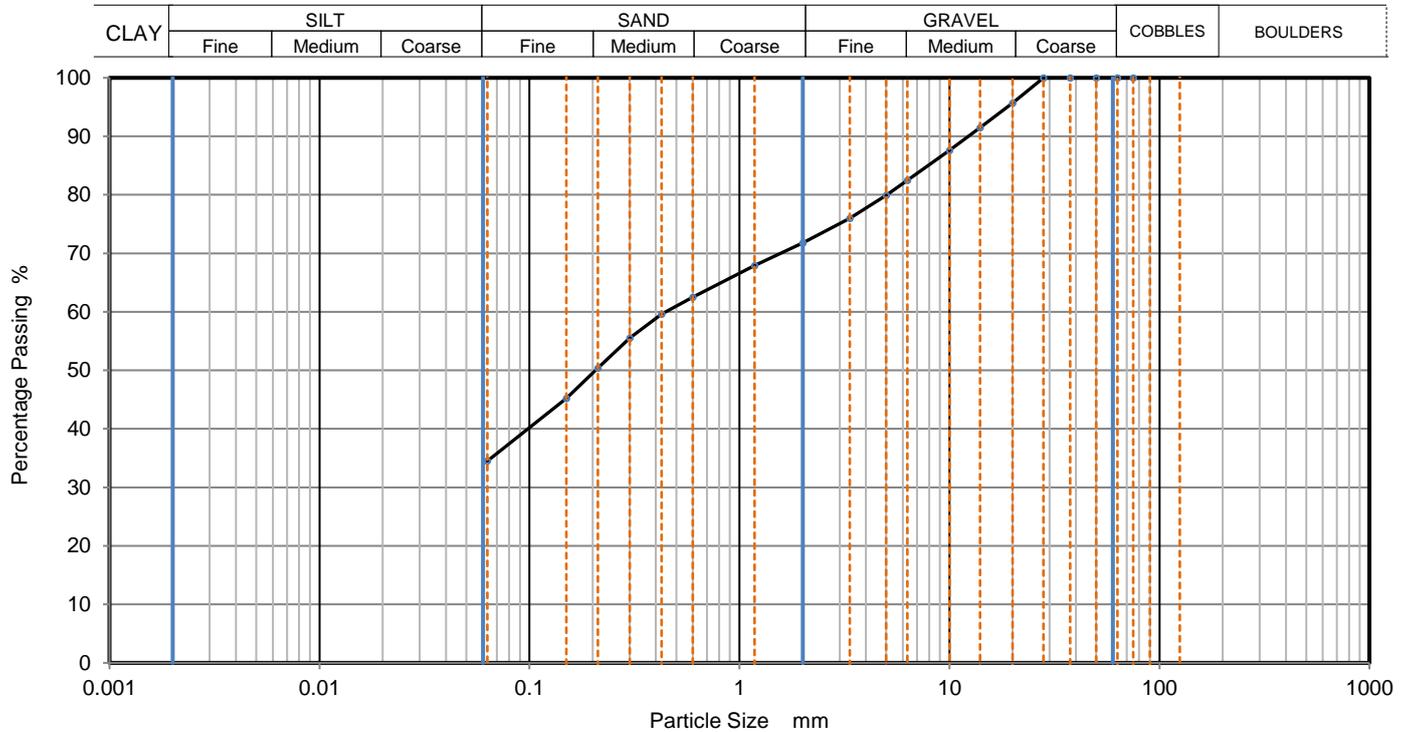
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP025
Sample No.	1
Depth, m	1.00
Sample Type	B
KeyLAB ID	IDL12022020412

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	92		
10	88		
6.3	83		
5	80		
3.35	76		
2	72		
1.18	68		
0.6	63		
0.425	60		
0.3	56		
0.212	50		
0.15	45		
0.063	35		

Dry Mass of sample, g 643

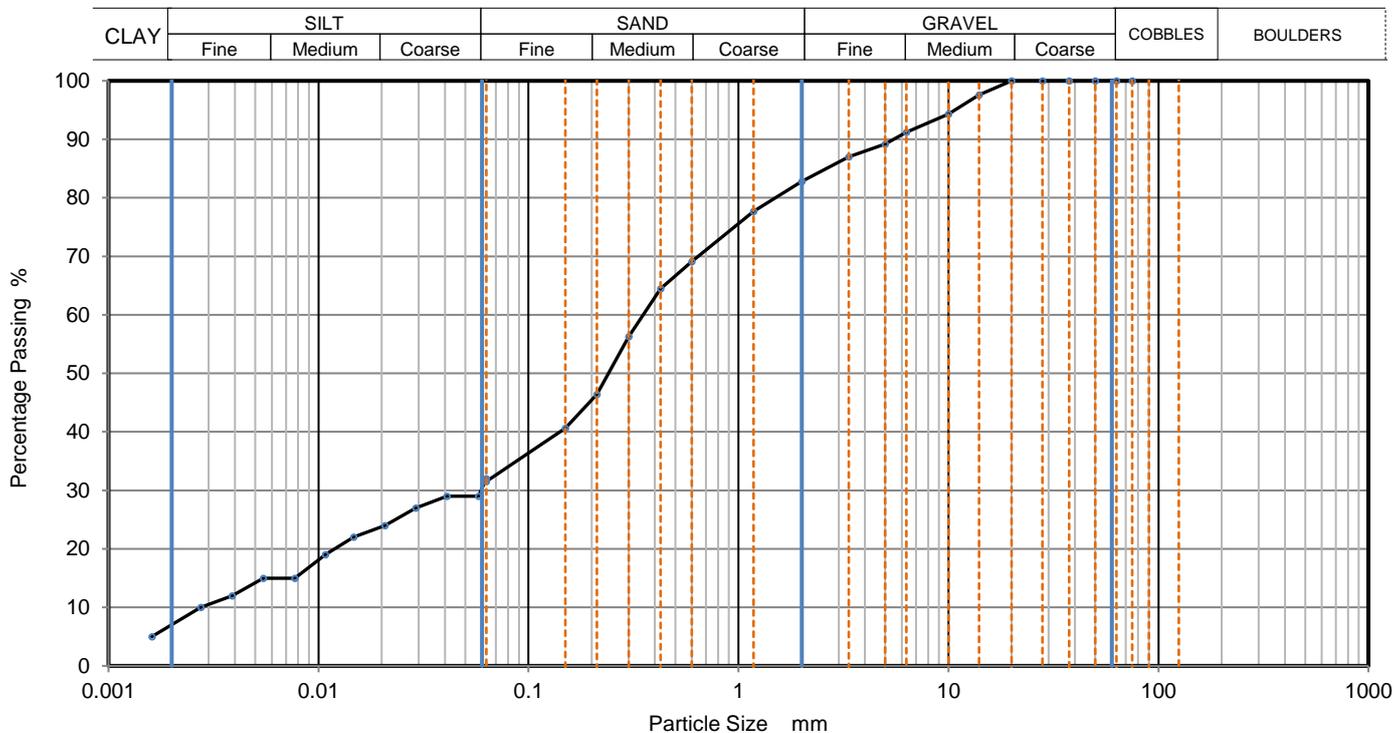
Sample Proportions	% dry mass
Very coarse	0
Gravel	28
Sand	37
Fines <0.063mm	34

Grading Analysis		
D100	mm	
D60	mm	0.448
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP026	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Orange-brown gravelly very silty medium SAND.		Depth, m	0.30	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL12021120794	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	32
		0.0578	29
75	100	0.0409	29
63	100	0.0291	27
50	100	0.0207	24
37.5	100	0.0147	22
28	100	0.0108	19
20	100	0.0077	15
14	98	0.0055	15
10	94	0.0039	12
6.3	91	0.0028	10
5	89	0.0016	5
3.35	87		
2	83		
1.18	78		
0.6	69	Particle density (assumed)	
0.425	65	2.65	Mg/m3
0.3	56		
0.212	46		
0.15	41		
0.063	32		

Dry Mass of sample, g

531

Sample Proportions	% dry mass
Very coarse	0
Gravel	17
Sand	51
Silt	25
Clay	7

Grading Analysis		
D100	mm	
D60	mm	0.351
D30	mm	0.0598
D10	mm	0.00288
Uniformity Coefficient		120
Curvature Coefficient		3.5

Remarks

Preparation and testing in accordance with BS1377 unless noted below

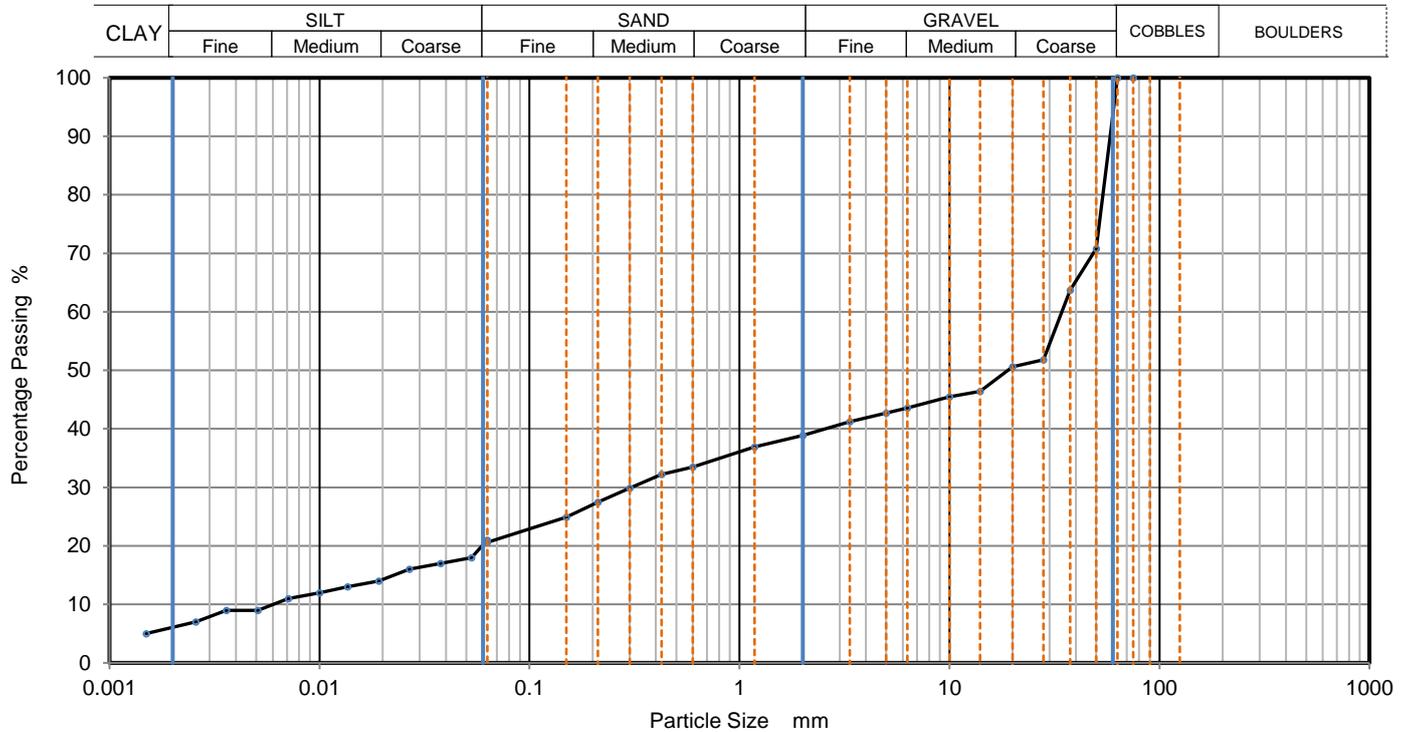
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP026
Sample No.	3
Depth, m	1.20
Sample Type	B
KeyLAB ID	IDL12021120797

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	21
		0.0530	18
75	100	0.0377	17
63	100	0.0268	16
50	71	0.0192	14
37.5	64	0.0136	13
28	52	0.0100	12
20	51	0.0071	11
14	46	0.0051	9
10	46	0.0036	9
6.3	44	0.0026	7
5	43	0.0015	5
3.35	41		
2	39		
1.18	37		
0.6	34	Particle density (assumed) 2.65 Mg/m ³	
0.425	32		
0.3	30		
0.212	28		
0.15	25		
0.063	21		

Dry Mass of sample, g 1220

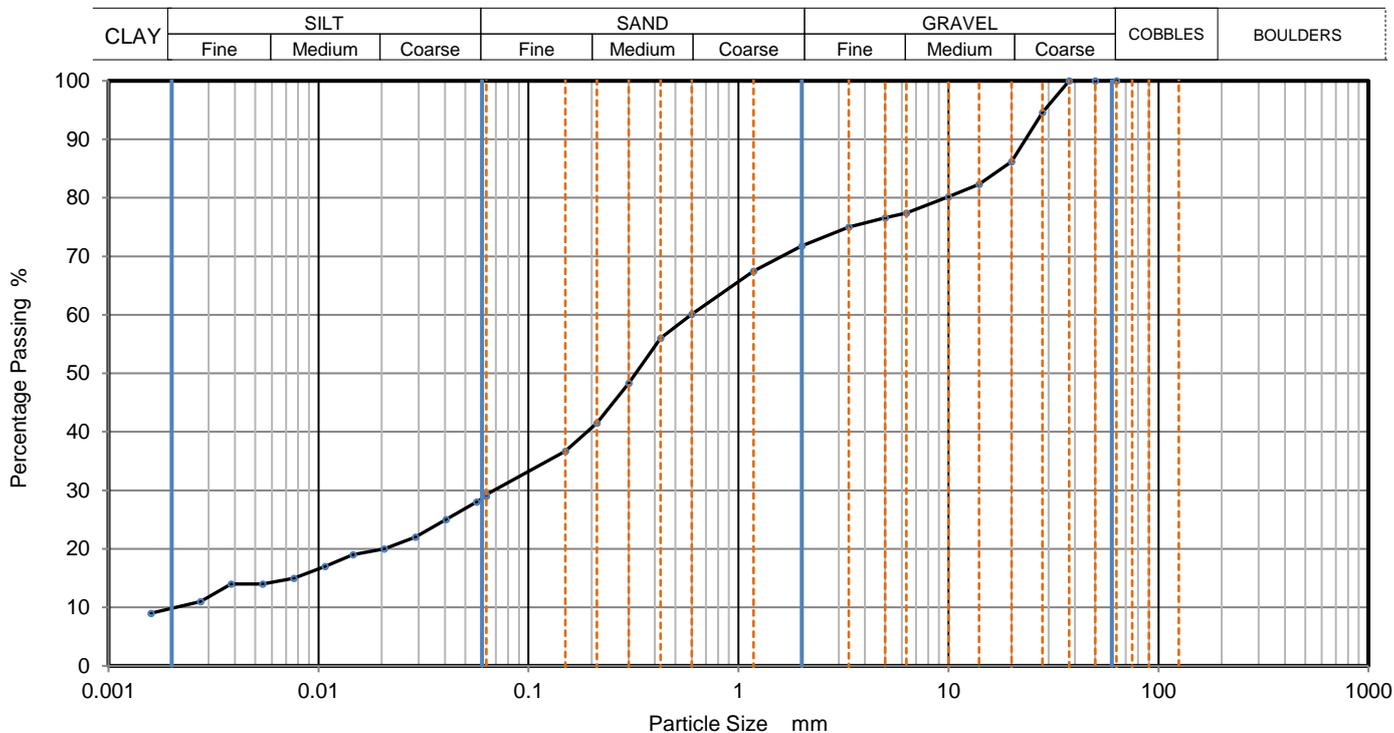
Sample Proportions	% dry mass
Very coarse	0
Gravel	61
Sand	18
Silt	15
Clay	6

Grading Analysis		
D100	mm	
D60	mm	34.3
D30	mm	0.303
D10	mm	0.00625
Uniformity Coefficient		5500
Curvature Coefficient		0.43

Remarks
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	PARTICLE SIZE DISTRIBUTION		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP027	
Site Name	WSP Eastern & Midlands Region		Sample No.	1	
Soil Description	Orange-brown very gravelly very silty SAND.		Depth, m	0.30	
Specimen Reference		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5		KeyLAB ID	IDL120211207101	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	29
		0.0565	28
		0.0404	25
63	100	0.0289	22
50	100	0.0206	20
37.5	100	0.0146	19
28	95	0.0107	17
20	86	0.0076	15
14	82	0.0054	14
10	80	0.0038	14
6.3	77	0.0027	11
5	77	0.0016	9
3.35	75		
2	72		
1.18	68		
0.6	60	Particle density (assumed)	
0.425	56	2.65	Mg/m3
0.3	48		
0.212	42		
0.15	37		
0.063	29		

Dry Mass of sample, g

696

Sample Proportions	% dry mass
Very coarse	0
Gravel	28
Sand	43
Silt	19
Clay	10

Grading Analysis		
D100	mm	
D60	mm	0.595
D30	mm	0.0684
D10	mm	0.00207
Uniformity Coefficient		290
Curvature Coefficient		3.8

Remarks

Preparation and testing in accordance with BS1377 unless noted below

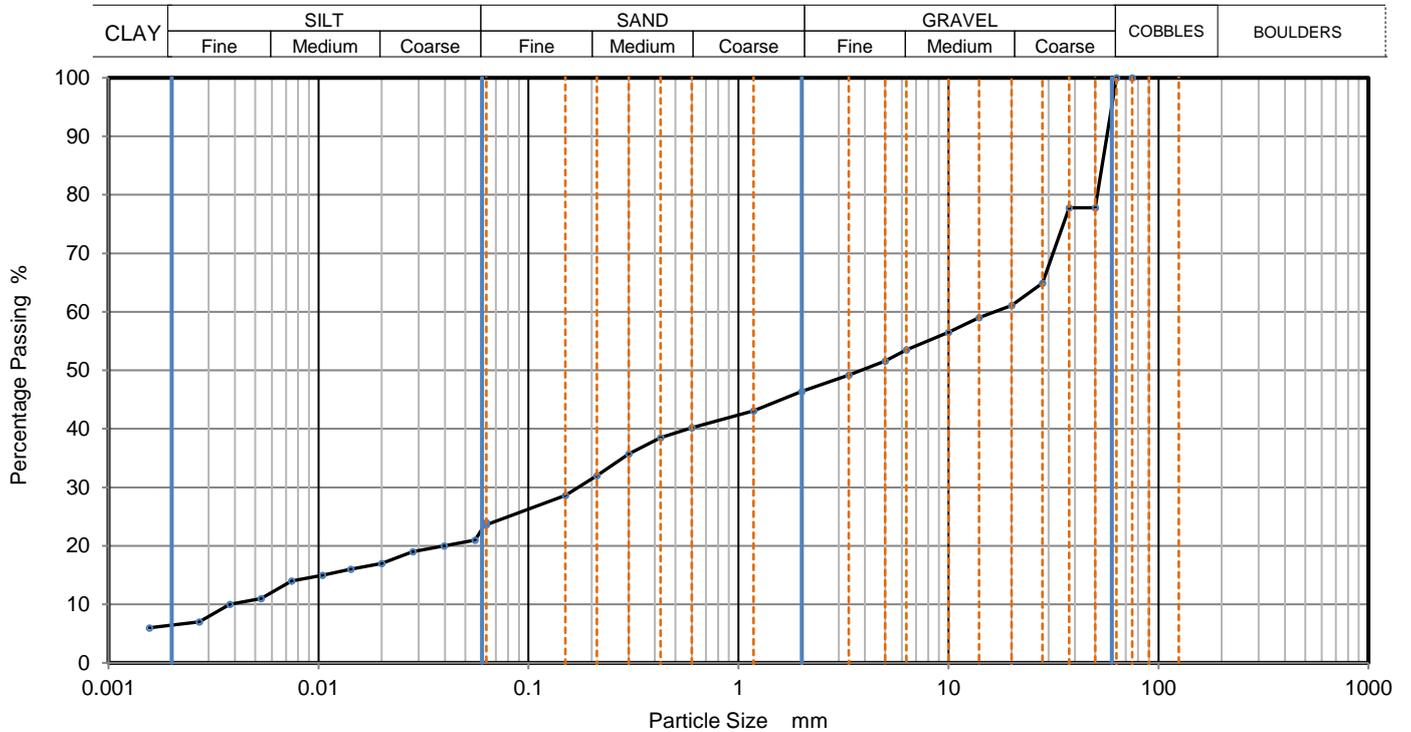
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP027
Sample No.	5
Depth, m	2.30
Sample Type	B
KeyLAB ID	IDL120211207106

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	24
		0.0556	21
75	100	0.0396	20
63	100	0.0282	19
50	78	0.0200	17
37.5	78	0.0142	16
28	65	0.0105	15
20	61	0.0074	14
14	59	0.0053	11
10	57	0.0038	10
6.3	54	0.0027	7
5	52	0.0016	6
3.35	49		
2	46		
1.18	43		
0.6	40	Particle density (assumed) 2.65 Mg/m ³	
0.425	39		
0.3	36		
0.212	32		
0.15	29		
0.063	24		

Dry Mass of sample, g 1205

Sample Proportions	% dry mass
Very coarse	0
Gravel	54
Sand	23
Silt	17
Clay	7

Grading Analysis	
D100	mm
D60	mm 16.7
D30	mm 0.173
D10	mm 0.00385
Uniformity Coefficient	4300
Curvature Coefficient	0.47

Remarks
Preparation and testing in accordance with BS1377 unless noted below

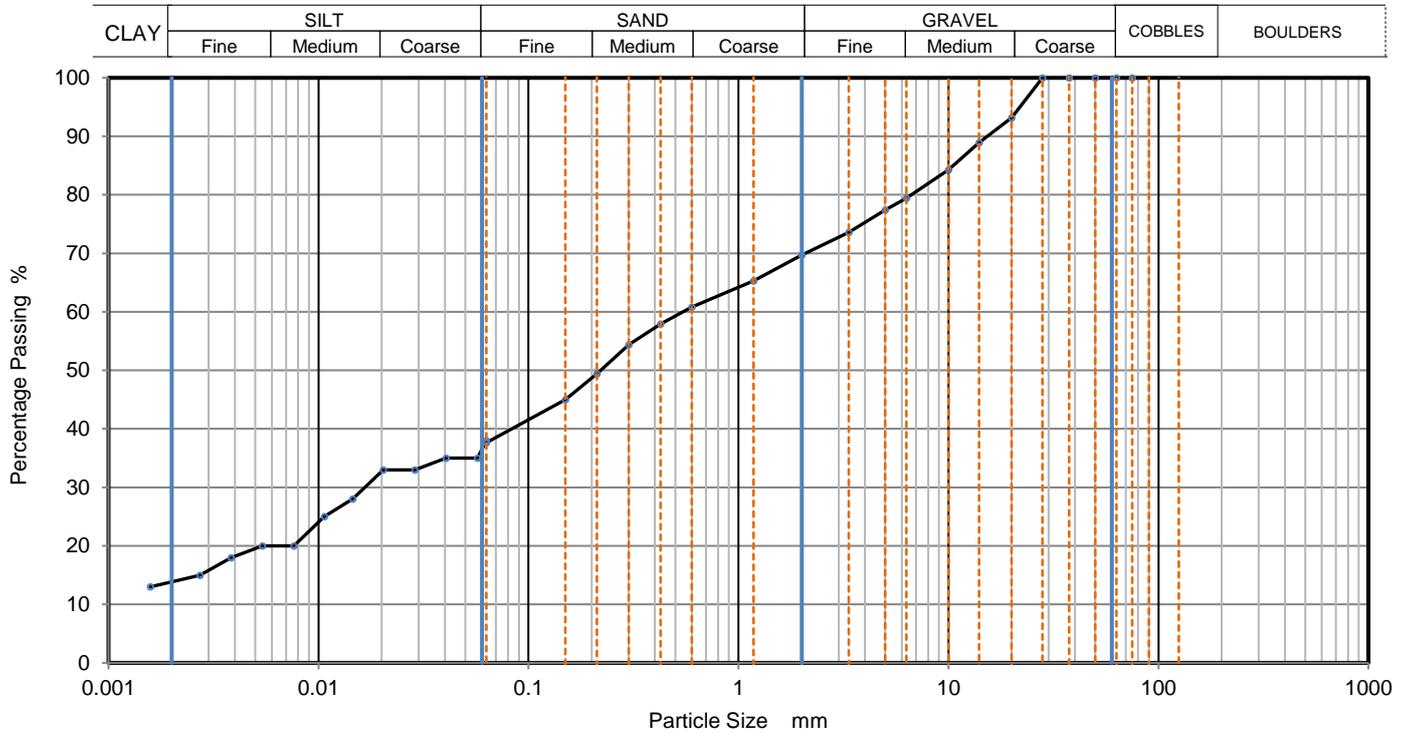
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP027
Sample No.	7
Depth, m	3.30
Sample Type	B
KeyLAB ID	IDL120211207108

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown slightly gravelly slightly sandy SILT.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	38
		0.0572	35
75	100	0.0404	35
63	100	0.0288	33
50	100	0.0203	33
37.5	100	0.0145	28
28	100	0.0107	25
20	93	0.0076	20
14	89	0.0054	20
10	84	0.0038	18
6.3	79	0.0027	15
5	77	0.0016	13
3.35	74		
2	70		
1.18	65		
0.6	61	Particle density (assumed)	
0.425	58	2.65	Mg/m3
0.3	54		
0.212	49		
0.15	45		
0.063	38		

Dry Mass of sample, g 932

Sample Proportions	% dry mass
Very coarse	0
Gravel	30
Sand	32
Silt	24
Clay	14

Grading Analysis		
D100	mm	
D60	mm	0.549
D30	mm	0.0171
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

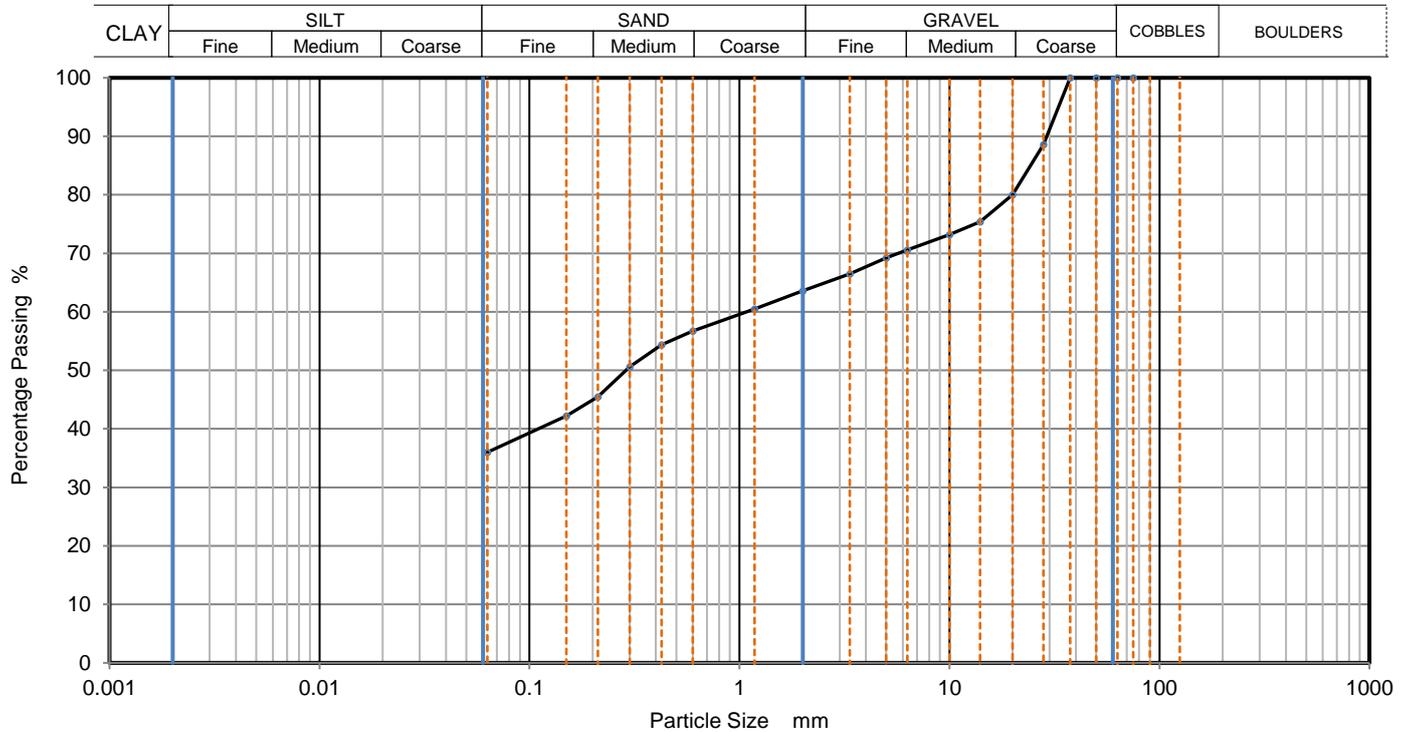
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP028
Sample No.	1
Depth, m	0.70
Sample Type	B
KeyLAB ID	IDL12022020416

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown slightly sandy gravelly SILT. Gravel is coarse.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	100		
28	89		
20	80		
14	75		
10	73		
6.3	71		
5	69		
3.35	67		
2	64		
1.18	61		
0.6	57		
0.425	54		
0.3	51		
0.212	46		
0.15	42		
0.063	36		

Dry Mass of sample, g 1037

Sample Proportions	% dry mass
Very coarse	0
Gravel	36
Sand	28
Fines <0.063mm	36

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

Remarks
Preparation and testing in accordance with BS1377 unless noted below

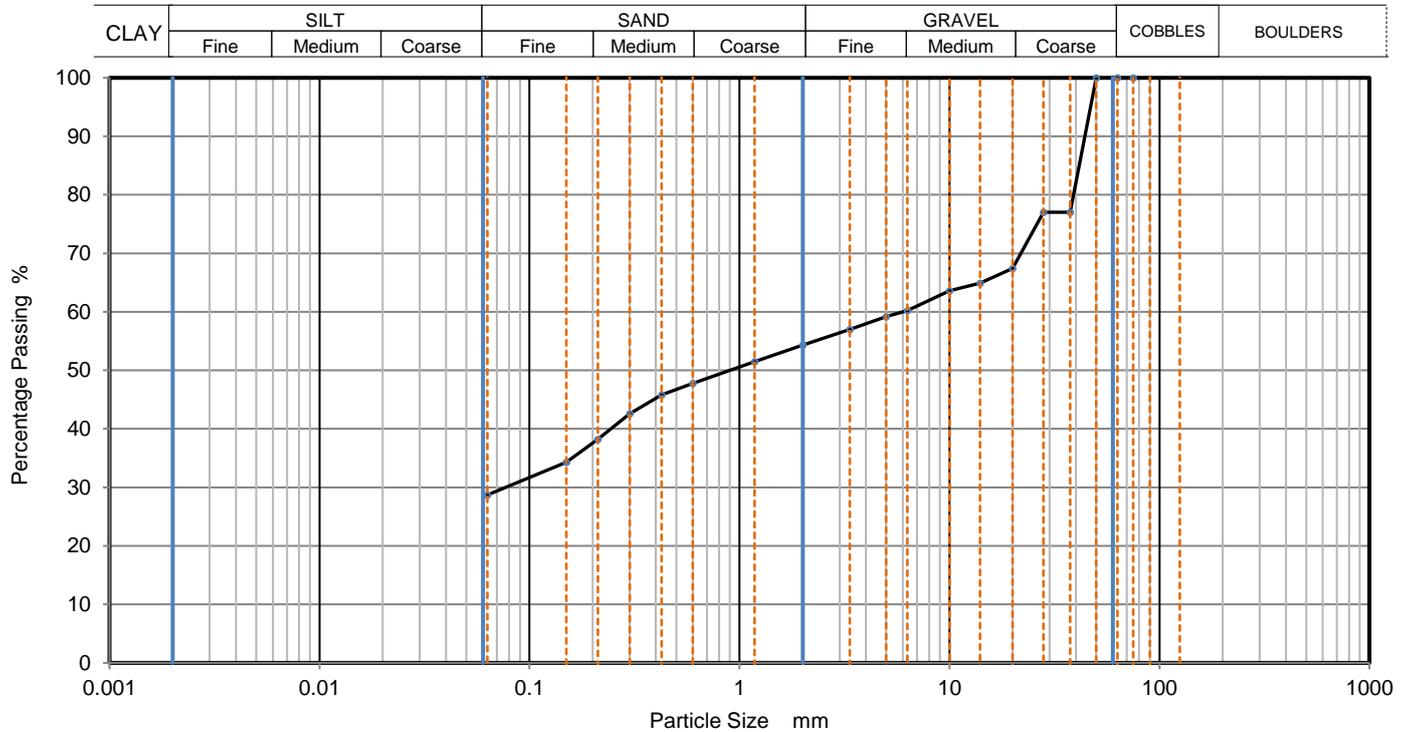
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TP028
Sample No.	5
Depth, m	3.50
Sample Type	B
KeyLAB ID	IDL12022020420

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clause 9.2	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
75	100		
63	100		
50	100		
37.5	77		
28	77		
20	67		
14	65		
10	64		
6.3	60		
5	59		
3.35	57		
2	54		
1.18	52		
0.6	48		
0.425	46		
0.3	43		
0.212	38		
0.15	34		
0.063	29		

Dry Mass of sample, g 945

Sample Proportions	% dry mass
Very coarse	0
Gravel	46
Sand	26
Fines <0.063mm	29

Grading Analysis	
D100	mm
D60	mm 5.99
D30	mm 0.0774
D10	mm
Uniformity Coefficient	
Curvature Coefficient	

Remarks
Preparation and testing in accordance with BS1377 unless noted below

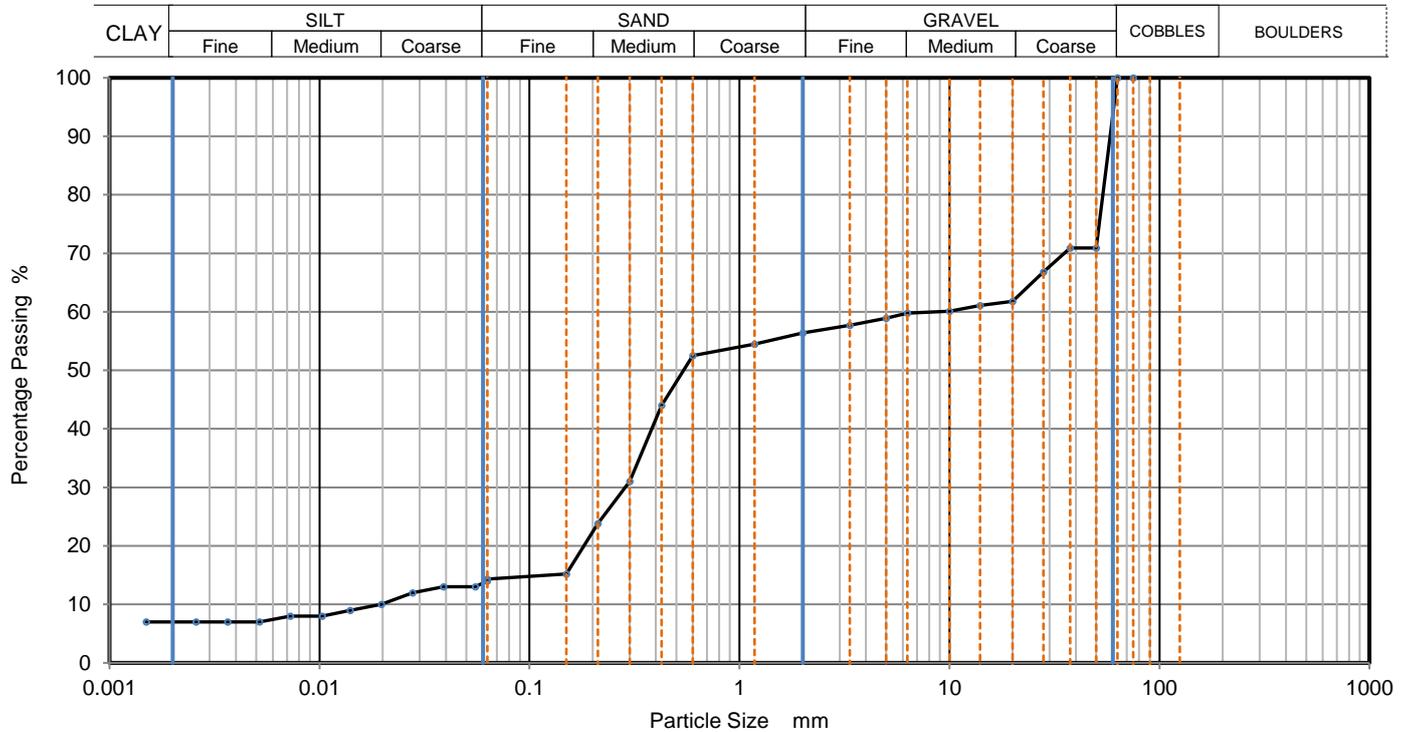
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PARTICLE SIZE DISTRIBUTION

Job Ref	2021OY102
Borehole/Pit No.	BPS-TPINF001
Sample No.	3
Depth, m	1.20
Sample Type	B
KeyLAB ID	IDL120211206224

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown silty medium SAND and coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Test Method	BS1377:Part 2:1990, clauses 9.2 and 9.5	



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
		0.0630	14
		0.0551	13
75	100	0.0390	13
63	100	0.0277	12
50	71	0.0197	10
37.5	71	0.0140	9
28	67	0.0103	8
20	62	0.0073	8
14	61	0.0052	7
10	60	0.0037	7
6.3	60	0.0026	7
5	59	0.0015	7
3.35	58		
2	56		
1.18	55		
0.6	53	Particle density (assumed) 2.65 Mg/m ³	
0.425	44		
0.3	31		
0.212	24		
0.15	15		
0.063	14		

Dry Mass of sample, g 728

Sample Proportions	% dry mass
Very coarse	0
Gravel	44
Sand	42
Silt	8
Clay	7

Grading Analysis		
D100	mm	
D60	mm	8.61
D30	mm	0.286
D10	mm	0.0177
Uniformity Coefficient		490
Curvature Coefficient		0.54

Remarks
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Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	85.4
50.000	79.6
37.500	76.5
28.000	74.5
20.000	72.9
14.000	70.9
10.000	69.0
6.300	65.2
5.000	62.7
3.350	60.5
2.000	57.7
1.180	54.7
0.600	51.2
0.425	49.3
0.300	46.8
0.212	43.5
0.150	39.8
0.063	31.9

Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	31.9			25.8			27.7			14.6	0.0

Sample Description Light brown slightly sandy slightly gravelly clayey SILT.

Project No. NMTL 3550

BH/TP No. BPS-BH011

Project WSP Eastern and Midlands Region

IDL PROJECT ID:2021OY102

Sample No. C

NMTL Ltd

Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	19/07/2022	Depth	8.50-10.00m
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Moisture Condition Value at Natural Moisture Content Summary of Results

Project No. 2021OY102		Project Name WSP Eastern & Midlands Region								
Hole No.	Sample				Soil Description	Retained on 20mm sieve %	Moisture Content <20mm %	Moisture Condition Value	Method of Interpretation	Remarks
	Ref	Top	Base	Type						
BPS-BH008	7	2.00	2.50	B	Light brown very sandy very silty coarse GRAVEL.		10.4	4.2	Best fit line	
BPS-BH010	10	3.00	3.50	B	Light brown slightly sandy very silty medium GRAVEL.		11.5	2.8	Best fit line	
BPS-TP001	7	3.00	3.30	B	Brown slightly sandy slightly gravelly SILT.		9.9	10.8	Best fit line	
BPS-TP003	5	2.40	2.70	B	Brownish-grey very sandy very silty coarse GRAVEL.		10.9	4.8	Best fit line	
BPS-TP009	3	1.20	1.50	B	Light brown slightly gravelly slightly sandy SILT.		10.6	6.0	Best fit line	
BPS-TP011	3	1.30	1.60	B	Light brown silty very sandy coarse GRAVEL.		12.1	7.3	Best fit line	
BPS-TP012	3	1.20	1.50	B	Brown silty very sandy coarse GRAVEL.	31	11.8	4.8	Best fit line	
BPS-TP012	5	2.60	2.90	B	Brownish-grey slightly gravelly sandy SILT.		13.7	9.0	Best fit line	
BPS-TP014	3	2.50	3.00	B	Light brown slightly sandy gravelly SILT.		11.3	5.7	Best fit line	
BPS-TP016	3	1.20	1.50	B	Light brown very silty very sandy coarse GRAVEL.		10.5	5.2	Best fit line	
BPS-TP026	5	2.80	3.10	B	Brown sandy very silty coarse GRAVEL.	8	11.1	4.2	Best fit line	
BPS-TP028	3	2.00	2.50	B	Light brown very sandy very silty coarse GRAVEL.		12.0	2.0	Best fit line	
Key Test performed in accordance with BS1377:Part4:1990, clause 5.4 unless annotated otherwise						Date Printed 26/07/2022		Approved By 		Table sheet QC Form R6

IDL	Moisture Condition Value / Moisture Content Relationship		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP008	
Site Name	WSP Eastern & Midlands Region		Sample No.	3	
Soil Description	Light brown very silty very sandy coarse GRAVEL.		Depth	1.5	
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description			KeyLAB ID	IDL12021120729	
Test Method	BS1377:Part4:1990:clause 5.5		Date started	29/03/2022	

Sample preparation

Amount of material larger than 20mm sieve removed %

Natural Moisture Content of sample %

Initial Moisture Content of test sample below 20mm %

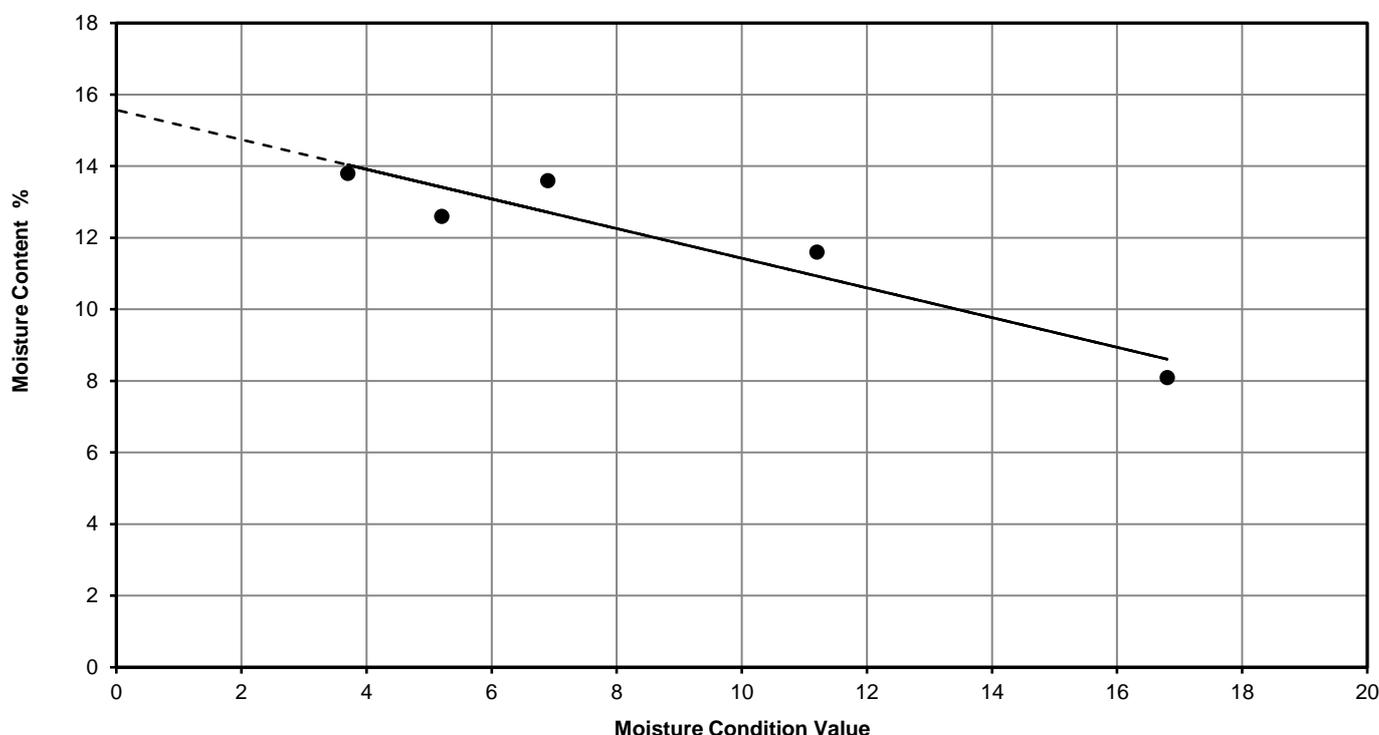
Composite of fresh and reused material tested

General remarks

Table of results

MCV Test Number	1	2	3	4	5
Moisture Content, %	13.6	12.6	13.8	11.6	8.1
Moisture Condition Value	6.9	5.2	3.7	11.2	16.8
MCV report	6.9	5.2	3.7	11.2	16.8
Effective / Valid data point	YES	YES	YES	YES	YES
Method of Interpretation	Best fit				
Specimen remarks					

● valid points × invalid points - - - - extended regression — linear regression



Tested	Checked	Approved
		BCB

Lab Sheet Reference : QC Form R7

IDL	Moisture Condition Value / Moisture Content Relationship		Job Ref	2021OY102	
			Borehole/Pit No.	BPS-TP027	
Site Name	WSP Eastern & Midlands Region		Sample No.	3	
Soil Description	Light brown very sandy very silty coarse GRAVEL.		Depth	1.3	
Specimen Reference		Specimen Depth	m	Sample Type	B
Specimen Description			KeyLAB ID	IDL120211207104	
Test Method	BS1377:Part4:1990:clause 5.5		Date started	29/03/2022	

Sample preparation

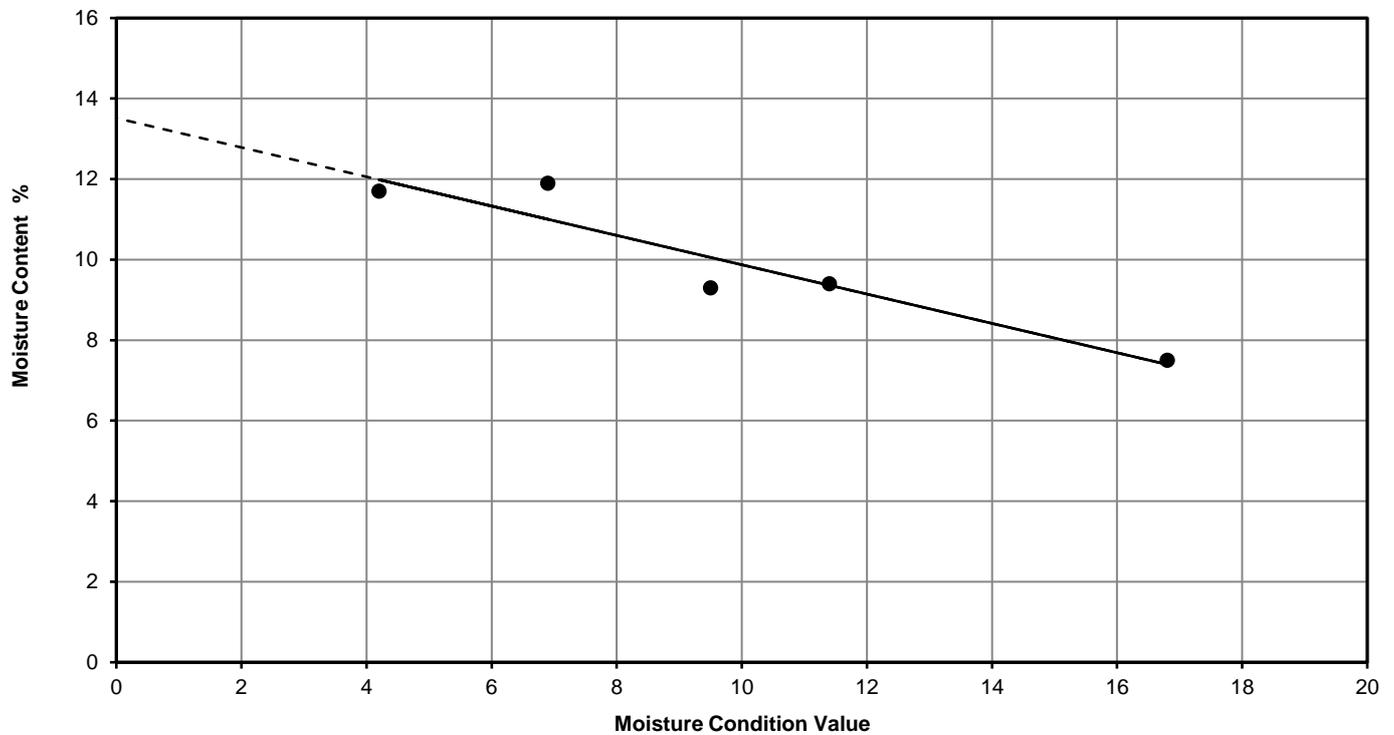
Amount of material larger than 20mm sieve removed	11	%
Natural Moisture Content of sample	7.9	%
Initial Moisture Content of test sample below 20mm	11.9	%
Composite of fresh and reused material tested		

General remarks

Table of results

MCV Test Number	1	2	3	4	5
Moisture Content, %	11.9	11.7	9.3	9.4	7.5
Moisture Condition Value	6.9	4.2	9.5	11.4	16.8
MCV report	6.9	4.2	9.5	11.4	16.8
Effective / Valid data point	YES	YES	YES	YES	YES
Method of Interpretation	Best fit				
Specimen remarks					

● valid points × invalid points - - - - extended regression — linear regression

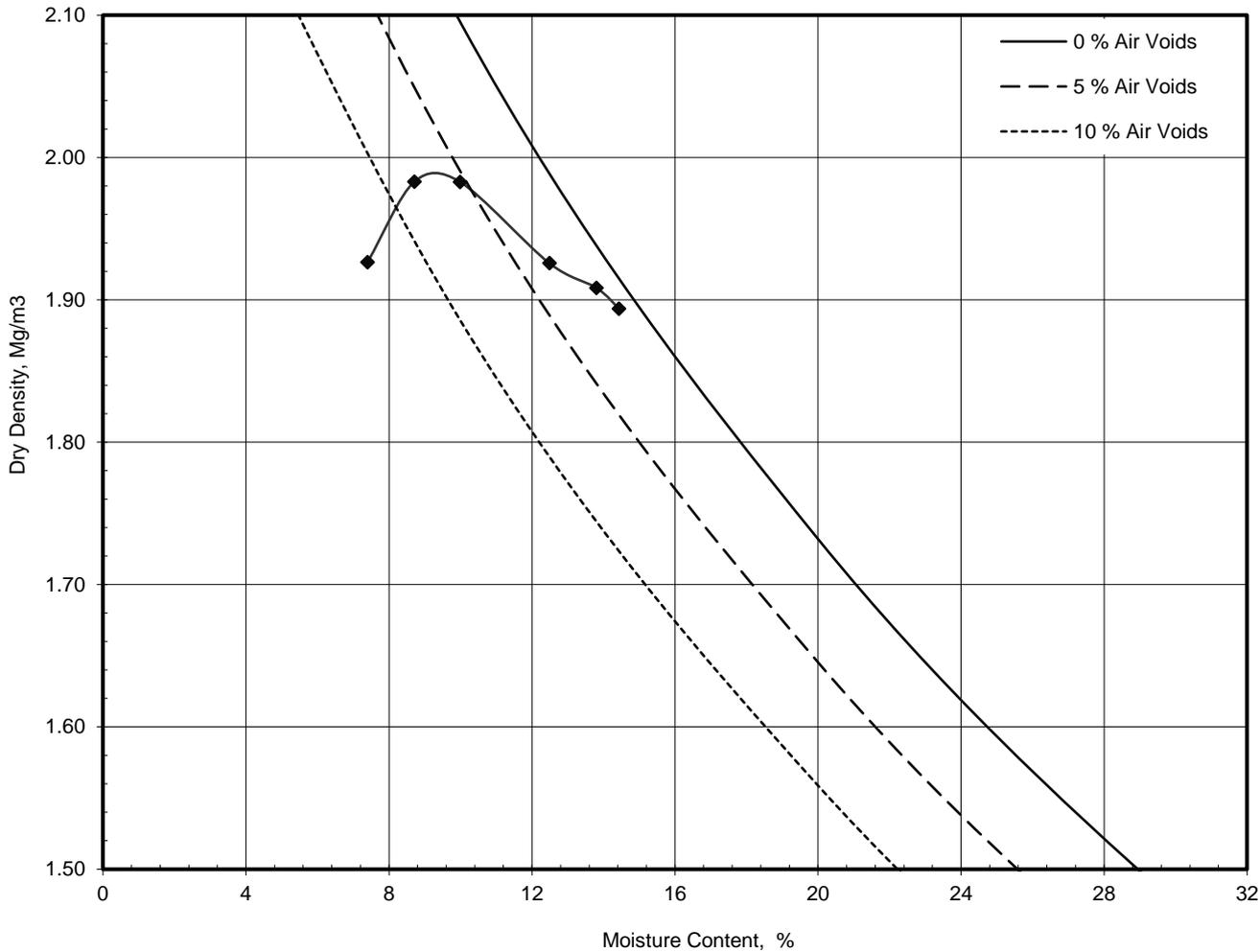


Tested	Checked	Approved
		SCS

Lab Sheet Reference : QC Form R7

Dry Density / Moisture Content Relationship Light Compaction		Job Ref	2021OY102	
		Borehole / Pit No	BPS-BH003	
Site Name	WSP Eastern & Midlands Region		Sample No	10
Soil Description	Greyish-brown very gravelly very silty fine SAND.		Depth	3.00 m
Specimen Ref.	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer		Keylab ID	IDL120220218170

Compaction Test Reference/No.



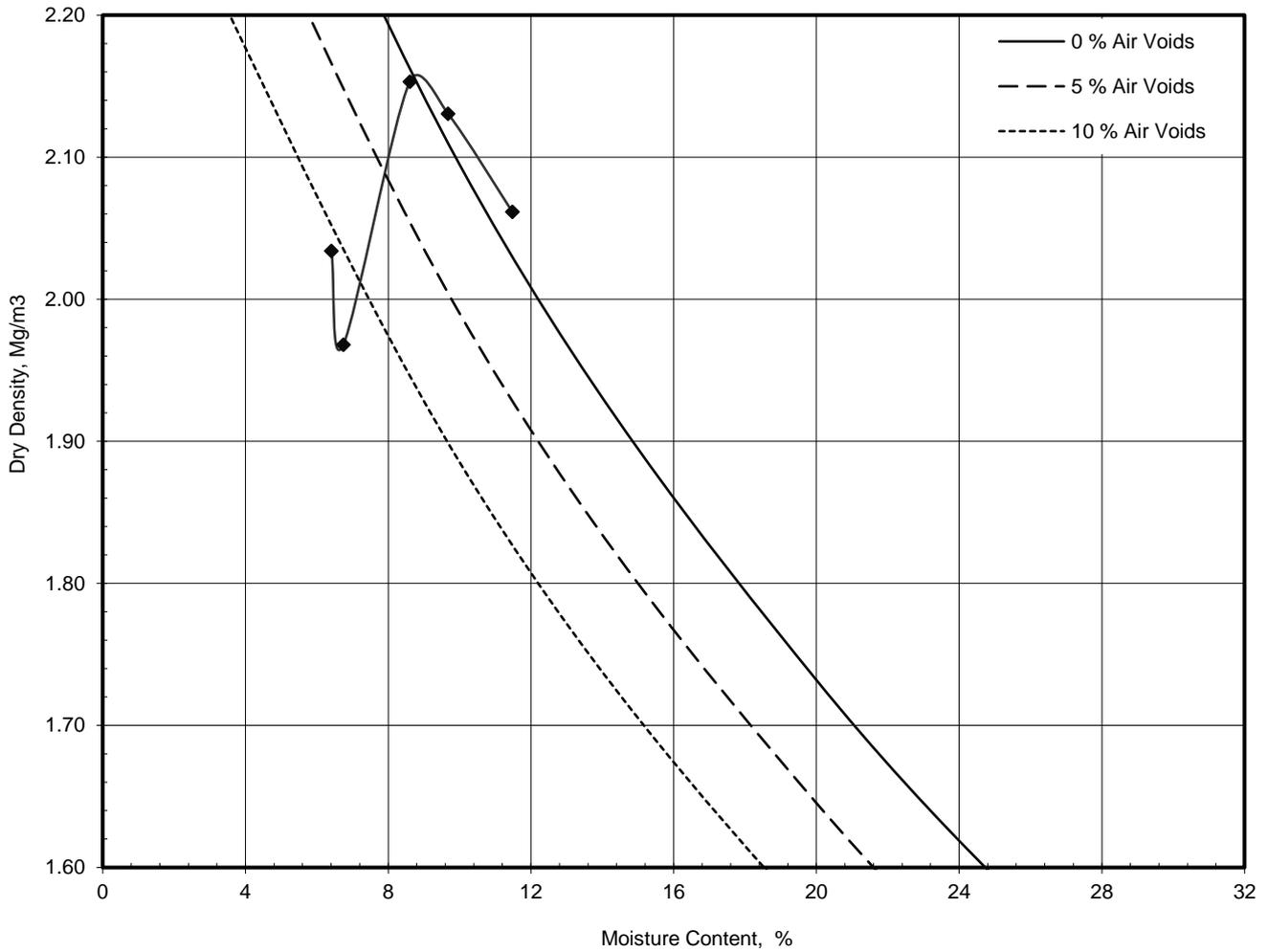
Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	18
Particle Density - Assumed	Mg/m ³	2.65

Maximum Dry Density	Mg/m ³	1.99
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Optimum Moisture Content	%	9.2
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Operator	Checked	Approved	Remarks	QC Form R4
Administrator		DCD		

Dry Density / Moisture Content Relationship Light Compaction		Job Ref	2021OY102	
		Borehole / Pit No	BPS-BH004	
Site Name	WSP Eastern & Midlands Region		Sample No	10
Soil Description	Brownish-grey slightly gravelly sandy SILT. Sand is medium.		Depth	3.00 m
Specimen Ref.	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer		Keylab ID	IDL120220218187
Compaction Test Reference/No.				



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	
Material Retained on 20.0 mm Sieve	%	
Particle Density - Assumed	Mg/m ³	2.65

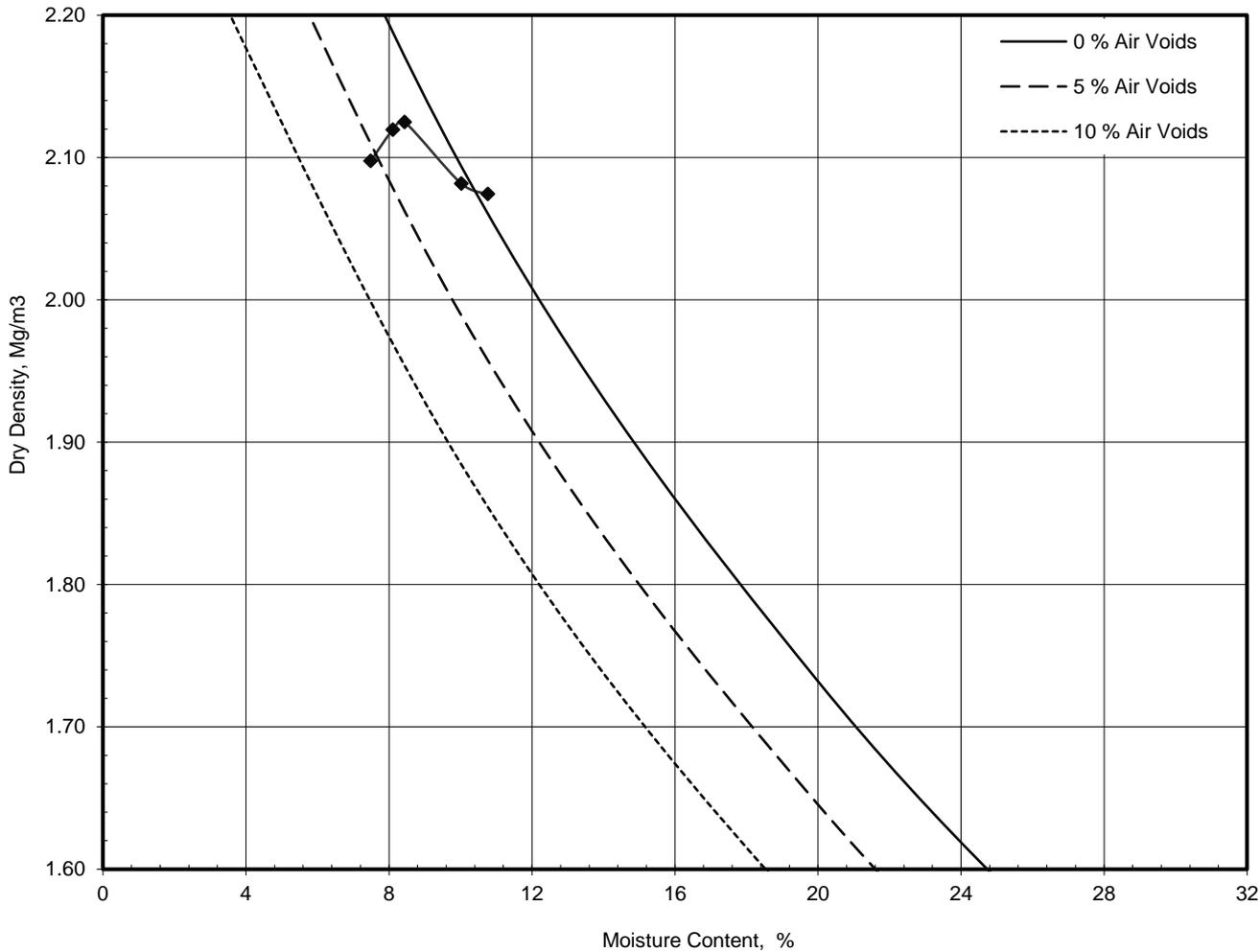
Maximum Dry Density	Mg/m ³	2.15
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Optimum Moisture Content	%	8.6
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Operator	Checked	Approved	Remarks	QC Form R4
Administrator		BCS		
				Sheet 1 of 1

Dry Density / Moisture Content Relationship Light Compaction		Job Ref	2021OY102		
		Borehole / Pit No	BPS-BH007		
Site Name	WSP Eastern & Midlands Region		Sample No	13	
Soil Description	Light brown very sandy very silty coarse GRAVEL.		Depth	4.00 m	
Specimen Ref.		Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.4, 2.5kg rammer		Keylab ID	IDL120220218226	

Compaction Test Reference/No.



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	29
Particle Density - Assumed	Mg/m ³	2.65

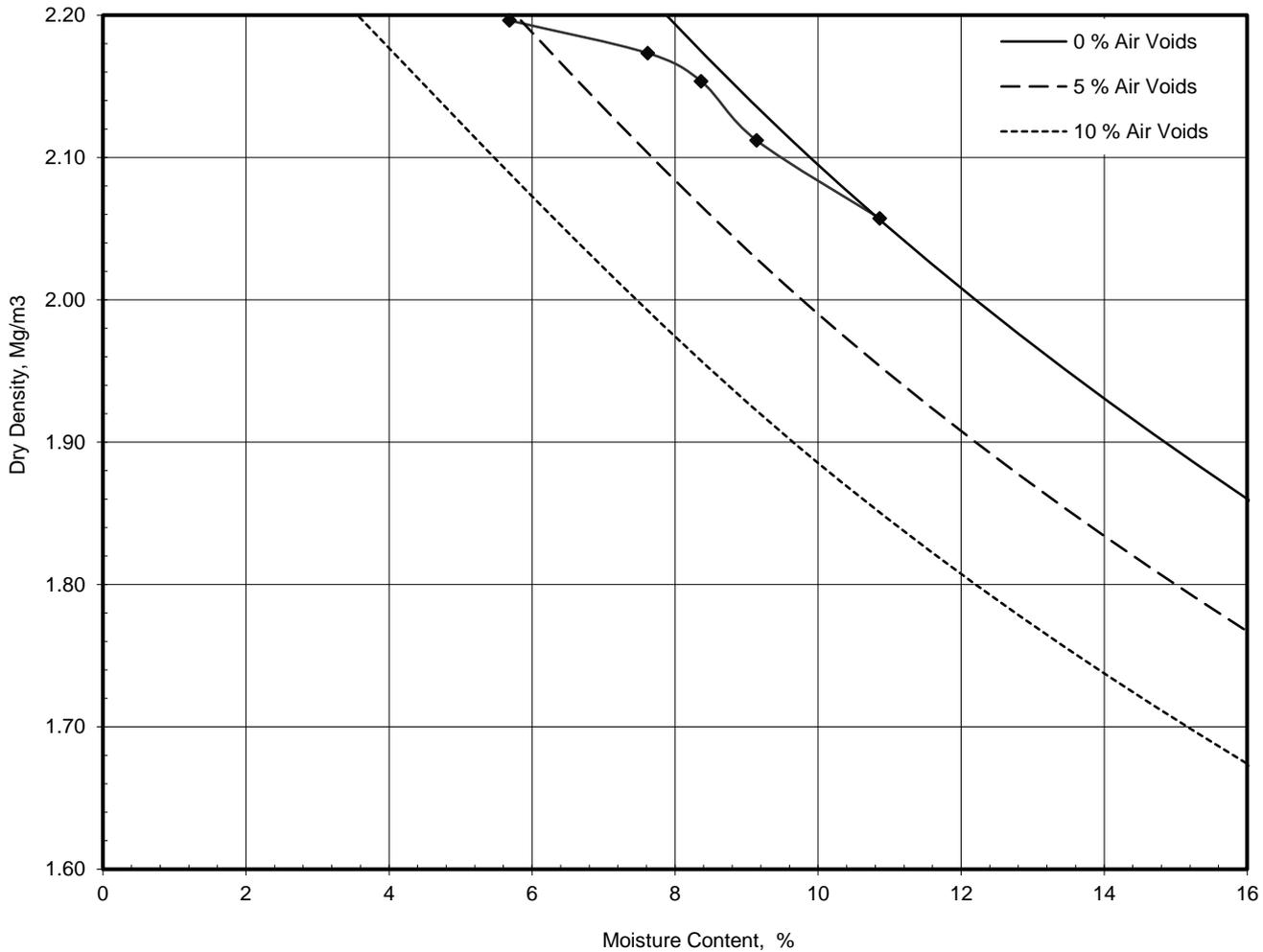
Maximum Dry Density	Mg/m ³	2.12
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Optimum Moisture Content	%	8.4
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Operator	Checked	Approved	Remarks	QC Form R4
Administrator		DCD		

Dry Density / Moisture Content Relationship Heavy Compaction		Job Ref	2021OY102		
		Borehole / Pit No	BPS-BH001		
Site Name	WSP Eastern & Midlands Region		Sample No	13	
Soil Description	Light brown very silty very sandy coarse GRAVEL.		Depth	4.00 m	
Specimen Ref.	1	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.6, 4.5kg rammer		Keylab ID	IDL12022020312	

Compaction Test Reference/No.



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	11
Particle Density - Assumed	Mg/m ³	2.65

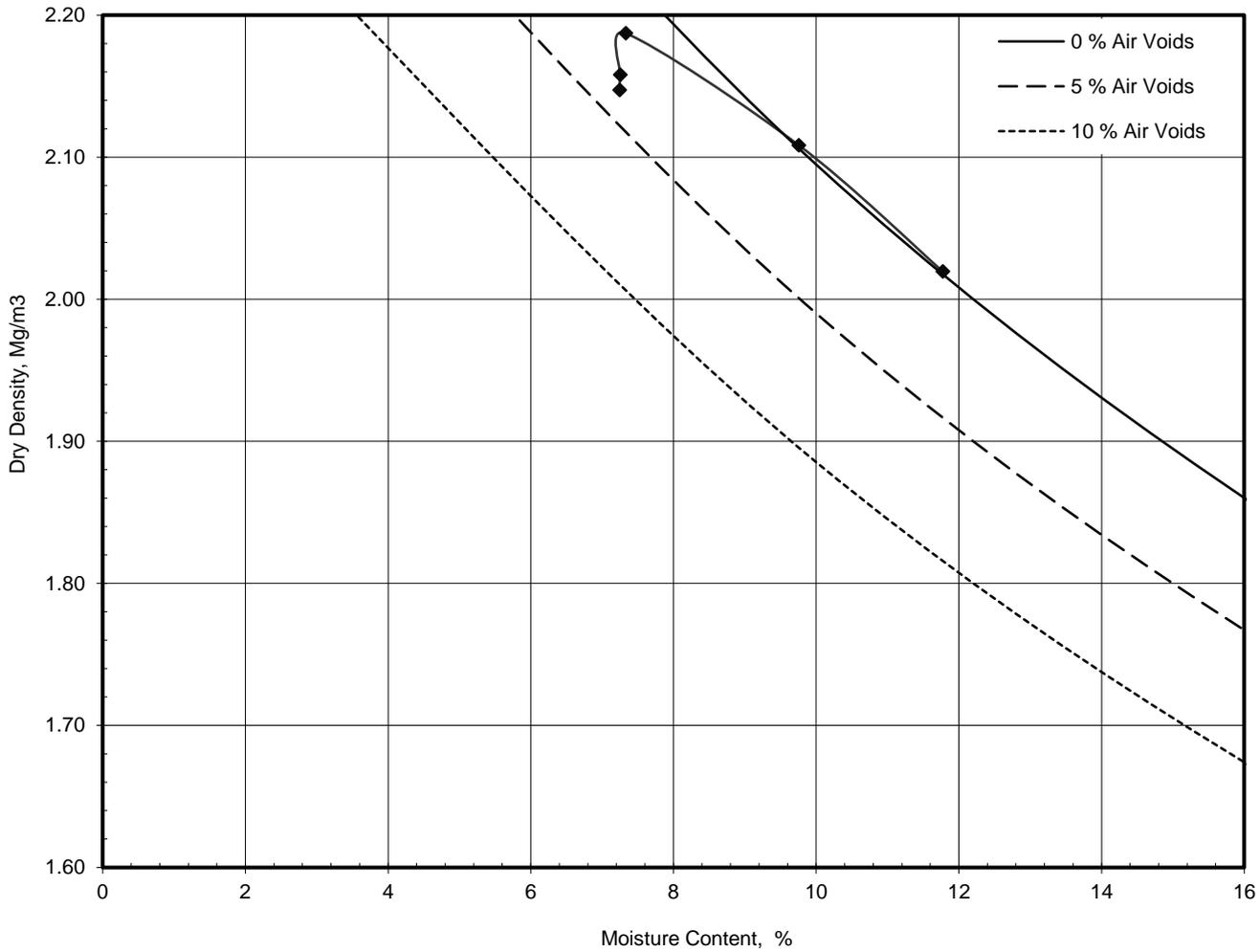
Maximum Dry Density	Mg/m ³	2.20
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Optimum Moisture Content	%	5.4
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Operator	Checked	Approved	Remarks	QC Form R4
Administrator		DCD		

Dry Density / Moisture Content Relationship Heavy Compaction		Job Ref	2021OY102		
		Borehole / Pit No	BPS-BH012		
Site Name	WSP Eastern & Midlands Region		Sample No	10	
Soil Description	Light brown very silty SAND and GRAVEL.		Depth	3.00 m	
Specimen Ref.	1	Specimen Depth	m	Sample Type	B
Test Method	BS1377:Part 4:1990, clause 3.6, 4.5kg rammer		Keylab ID	IDL12022020326	

Compaction Test Reference/No. _____



Preparation	Material used was natural	
Mould Type	CBR	
Samples Used	Composite specimens tested	
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	17
Particle Density - Assumed	Mg/m ³	2.65

Maximum Dry Density	Mg/m ³	2.19
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Optimum Moisture Content	%	7.3
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Operator	Checked	Approved	Remarks	QC Form R4
Administrator		SCS		

Tested in: Irish Drilling Ltd.(IDL), Old Galway Road, Loughrea, Co. Galway, Ireland. H62VX39
 Approved Signatures: Dympna Darcy (DCD) Lab Manager, Declan Joyce (DJ) Chartered Geotechnical Engineer, Ronan Killeen (RK) Quality Manager.



California Bearing Ratio (CBR)

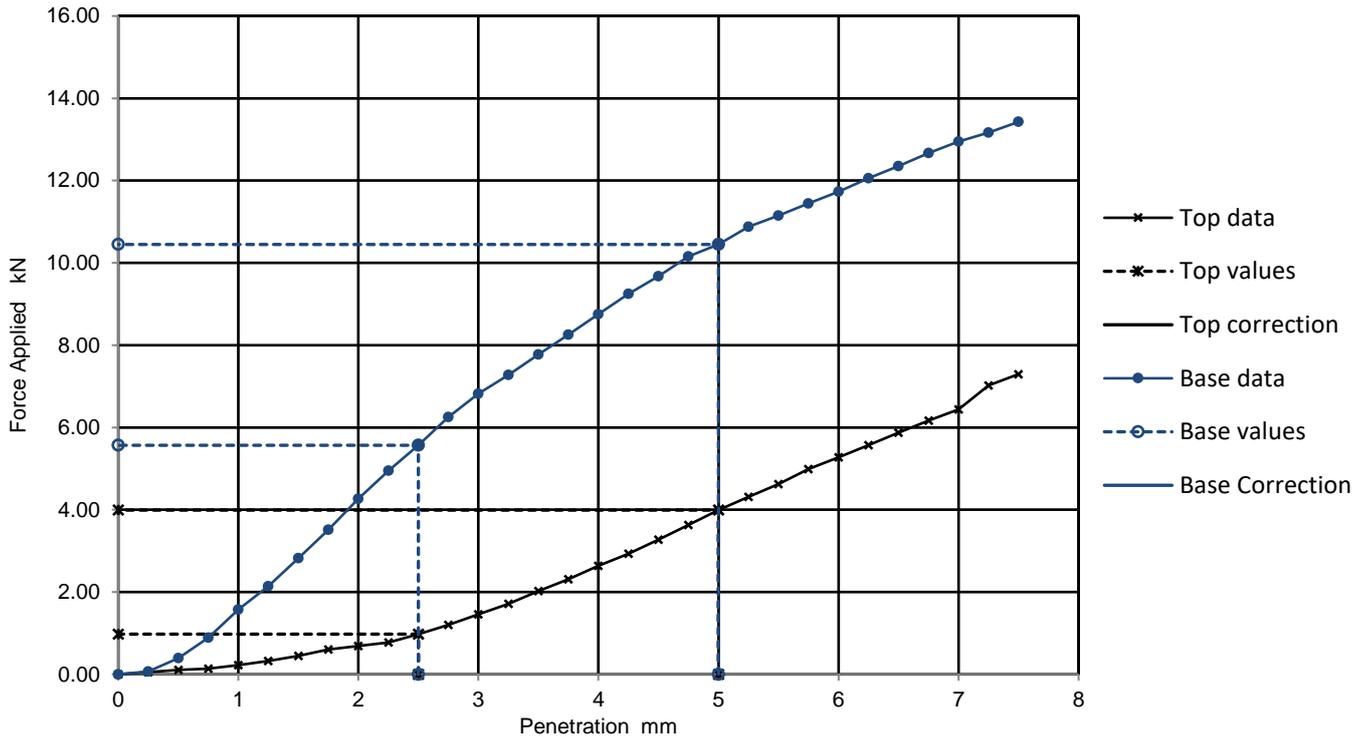
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP001
Sample No.	3
Depth m	0.90
Sample Type	B
KeyLAB ID	IDL1202112072
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very silty very sandy GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.29	Mg/m3
	Dry density	2.11	Mg/m3
	Moisture content	8.5	%
		Surcharge applied	2 kg
			1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	7.4	20.0	20.0	8.5	
BASE	No	42.0	52.0	52.0		
					7.9	

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	1

Lab Sheet Reference :



California Bearing Ratio (CBR)

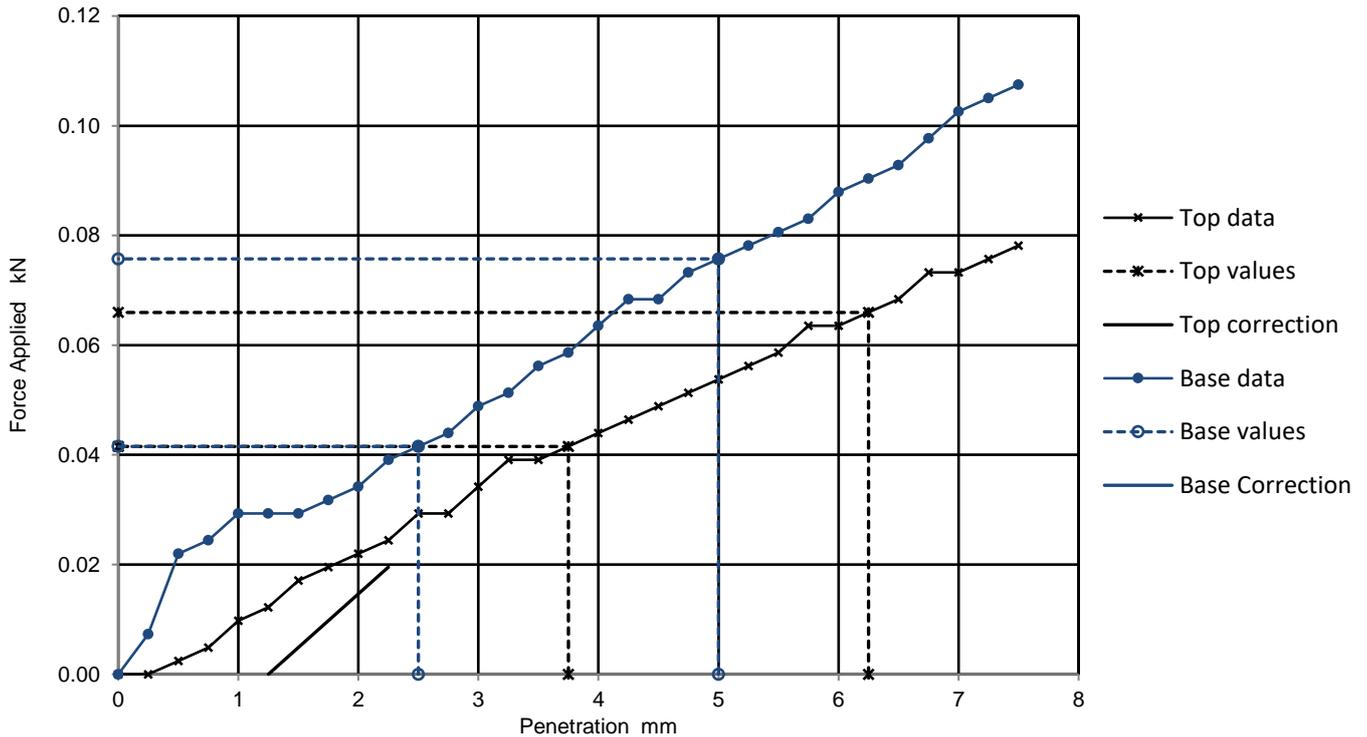
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP002
Sample No.	5
Depth m	2.80
Sample Type	B
KeyLAB ID	IDL12021120712
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Greyish-brown very silty SAND and GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	13 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.29 Mg/m3	Surcharge applied
	Dry density	2.05 Mg/m3	2 kg
	Moisture content	11.9 %	1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	Yes	0.3	0.3	0.3	0.4	11.9
BASE	No	0.3	0.4	0.4		11.8

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	2

Lab Sheet Reference :



California Bearing Ratio (CBR)

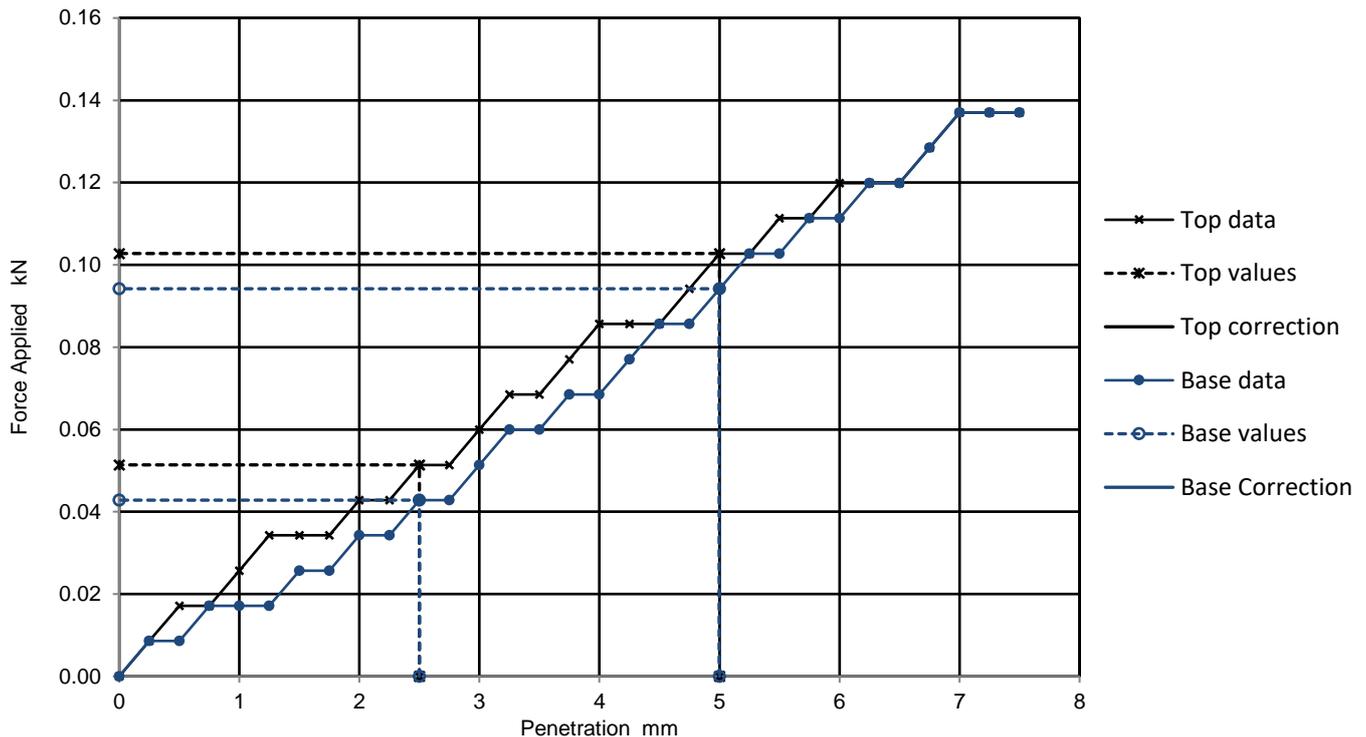
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP004
Sample No.	1
Depth m	0.30
Sample Type	B
KeyLAB ID	IDL1202111300
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Orange-brown very gravelly very silty SAND.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.05	Mg/m3
	Dry density	1.72	Mg/m3
	Moisture content	19.5	%
		Surcharge applied	2 kg
			1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	0.4	0.5	0.5	0.5	19.3
BASE	No	0.3	0.5	0.5		19.5

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	3

Lab Sheet Reference :



California Bearing Ratio (CBR)

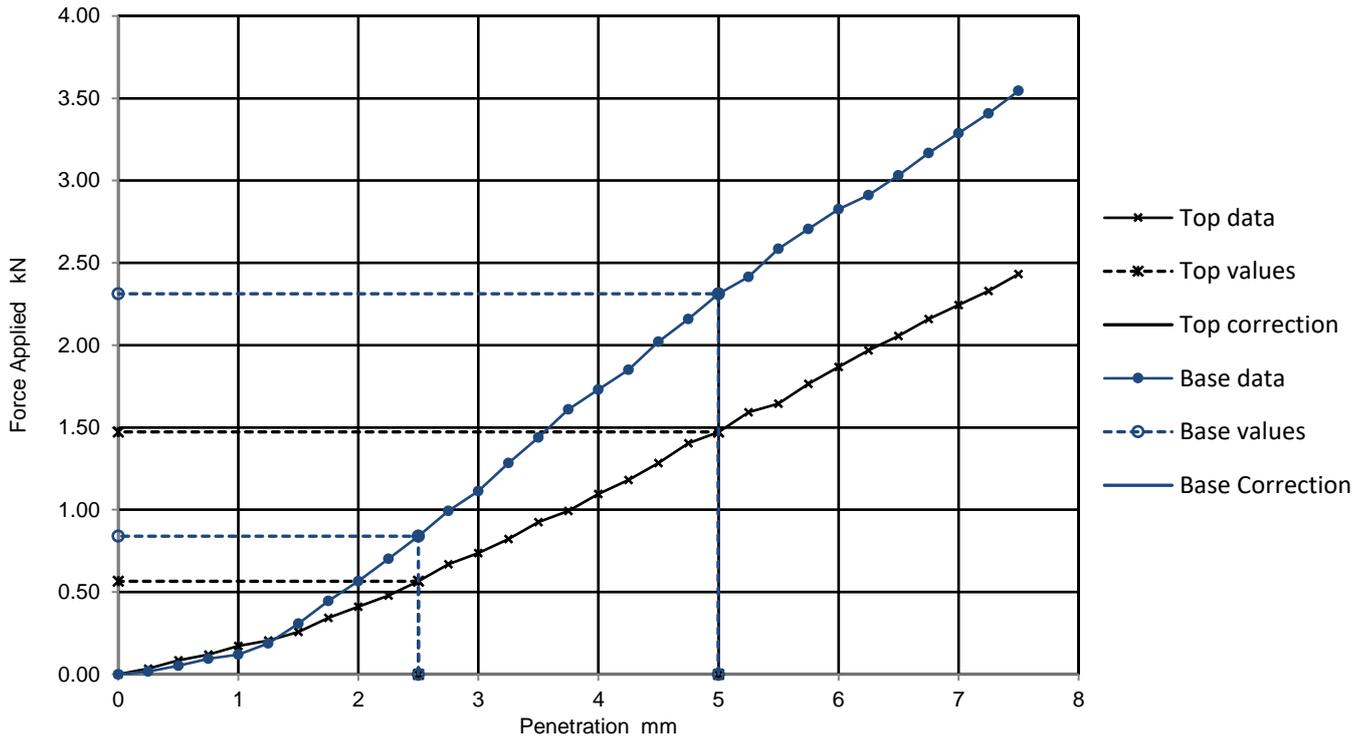
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP005
Sample No.	3
Depth m	2.50
Sample Type	B
KeyLAB ID	IDL1202202042
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown silty very sandy medium GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	28 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.33 Mg/m3	Surcharge applied
	Dry density	2.15 Mg/m3	2 kg
	Moisture content	8.5 %	1 kPa

Force v Penetration Plots



Results

Curve correction applied	CBR Values, %				Moisture Content %
	2.5mm	5mm	Highest	Average	
TOP	4.3	7.4	7.4		8.5
BASE	6.4	12.0	12.0		8.3

General remarks

Test specific remarks

Approved

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Fig No.	1
QC From R9	
Sheet No	4

Lab Sheet Reference :



California Bearing Ratio (CBR)

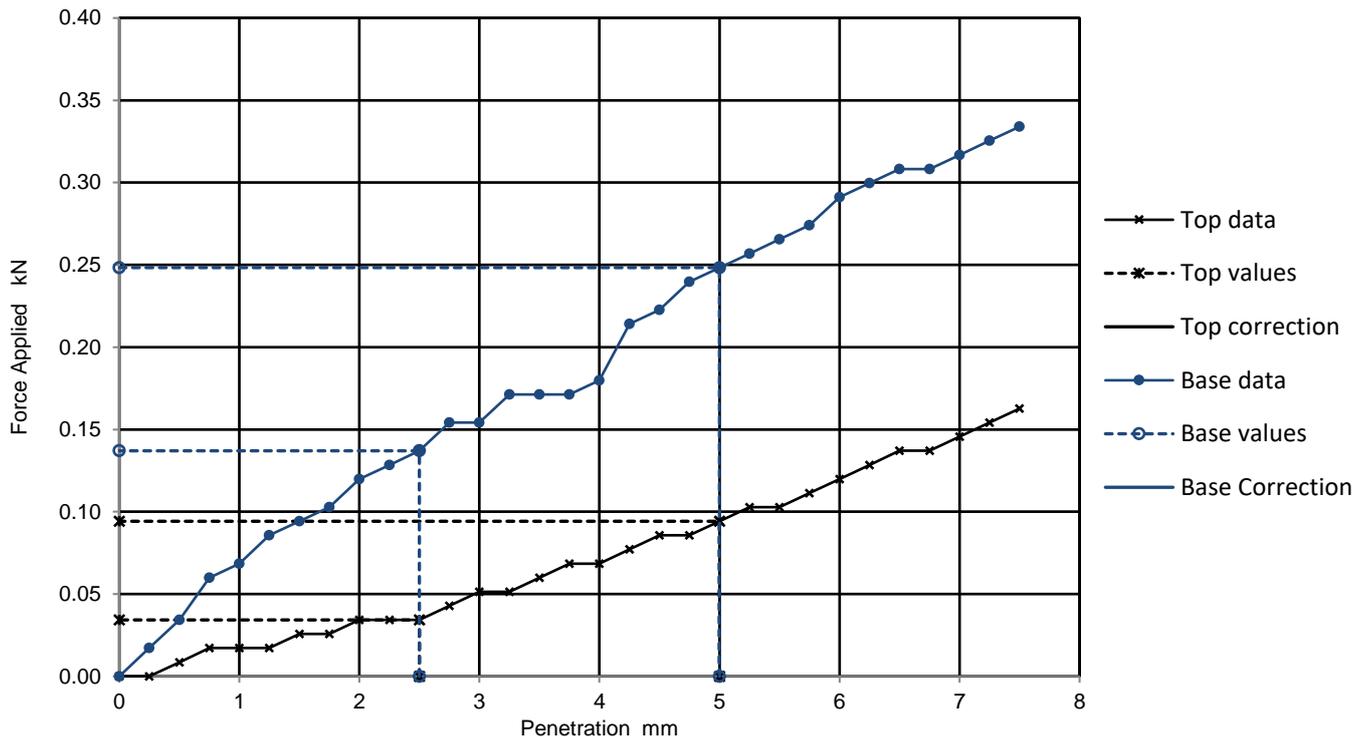
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP007
Sample No.	5
Depth m	2.50
Sample Type	B
KeyLAB ID	IDL12021120724
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brownish-grey slightly gravelly sandy SILT.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	7 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.27 Mg/m3	Surcharge applied
	Dry density	2.07 Mg/m3	2 kg
	Moisture content	9.6 %	1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	0.3	0.5	0.5	9.6	
BASE	No	1.0	1.2	1.2		
					9.2	

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	5

Lab Sheet Reference :



California Bearing Ratio (CBR)

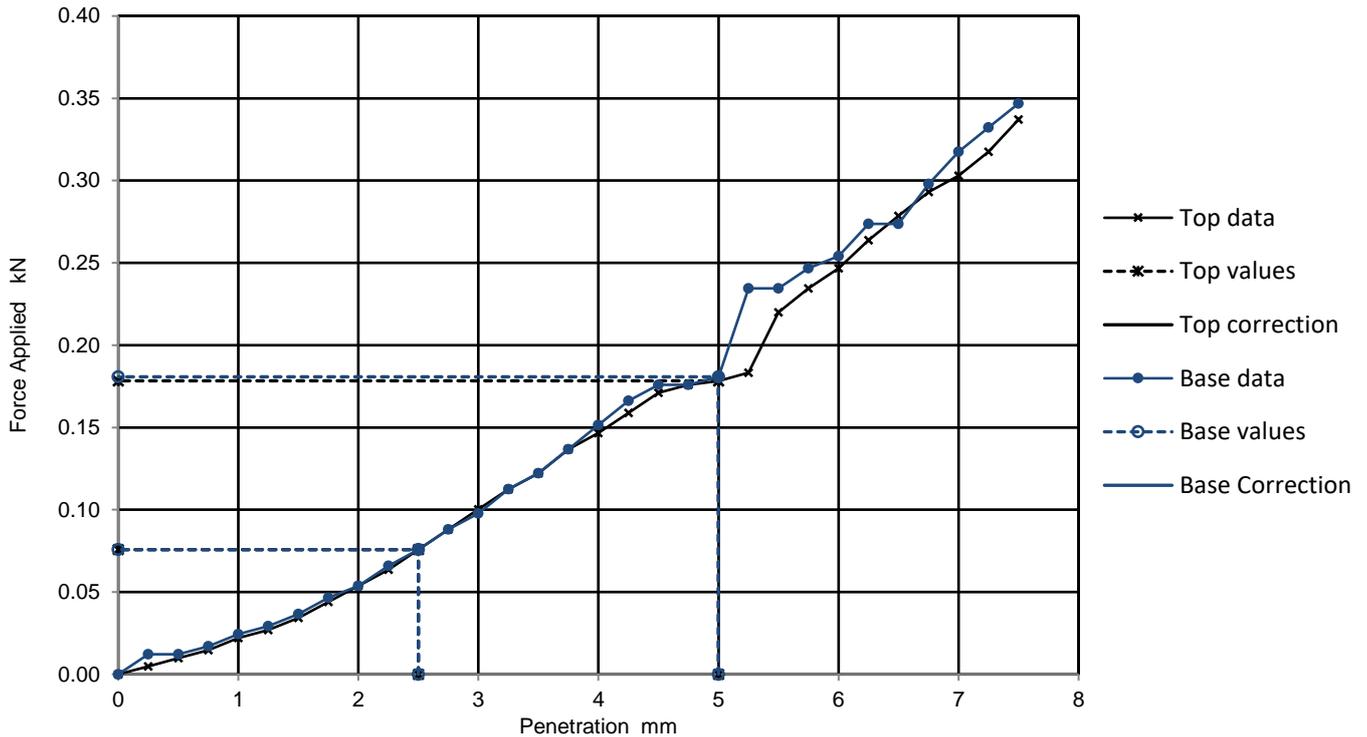
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP011
Sample No.	7
Depth m	3.30
Sample Type	B
KeyLAB ID	IDL12021120750
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.28 Mg/m3	Surcharge applied
	Dry density	2.07 Mg/m3	2 kg
	Moisture content	10.4 %	1 kPa

Force v Penetration Plots



Results

Curve correction applied	CBR Values, %				Moisture Content %
	2.5mm	5mm	Highest	Average	
TOP	0.6	0.9	0.9	0.9	10.4
BASE	0.6	0.9	0.9		10.0

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	6

Lab Sheet Reference :



California Bearing Ratio (CBR)

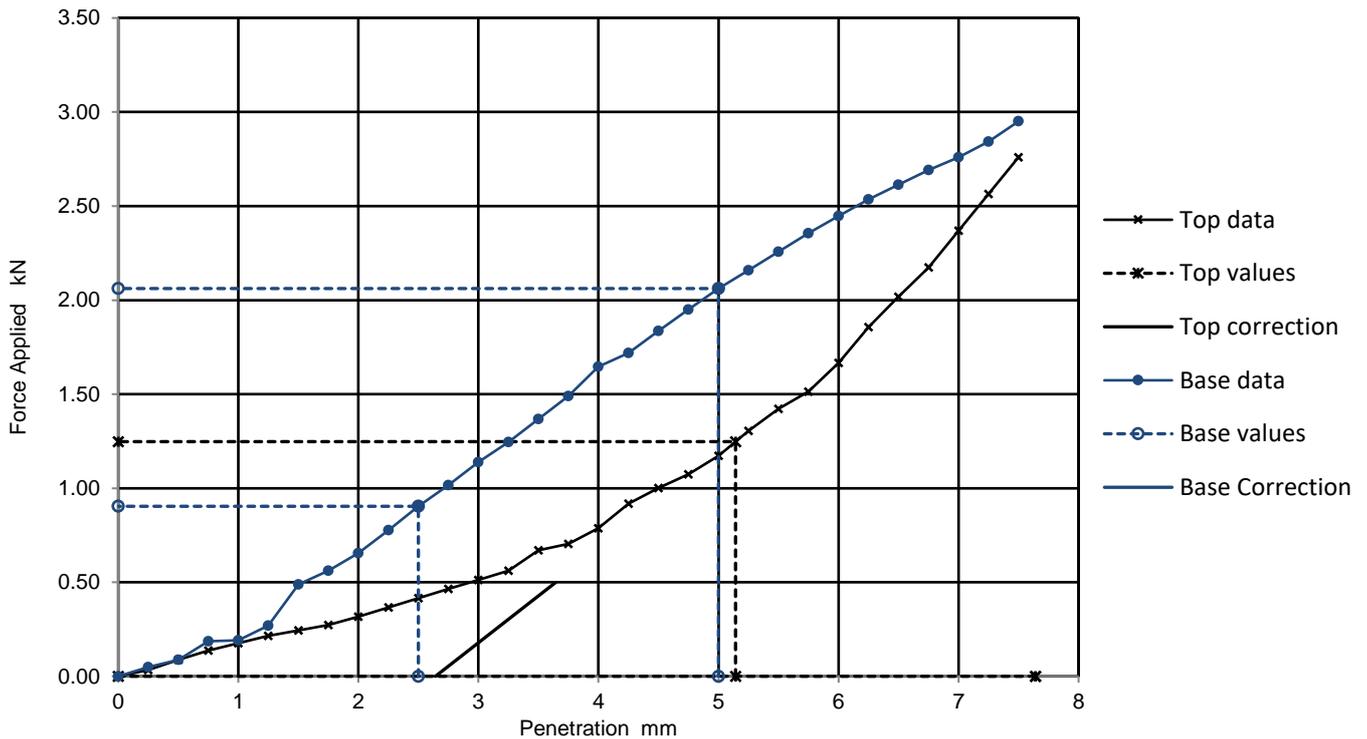
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP016
Sample No.	7
Depth m	3.80
KeyLAB ID	IDL12021120767
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Brown very silty SAND and GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description	Sample Type	
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	23 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	1.86 Mg/m3	Surcharge applied
	Dry density	1.70 Mg/m3	2 kg
	Moisture content	9.3 %	1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	Yes	9.5		9.5	9.9	9.3
BASE	No	6.8	10.0	10.0		9.2

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	7

Lab Sheet Reference :



California Bearing Ratio (CBR)

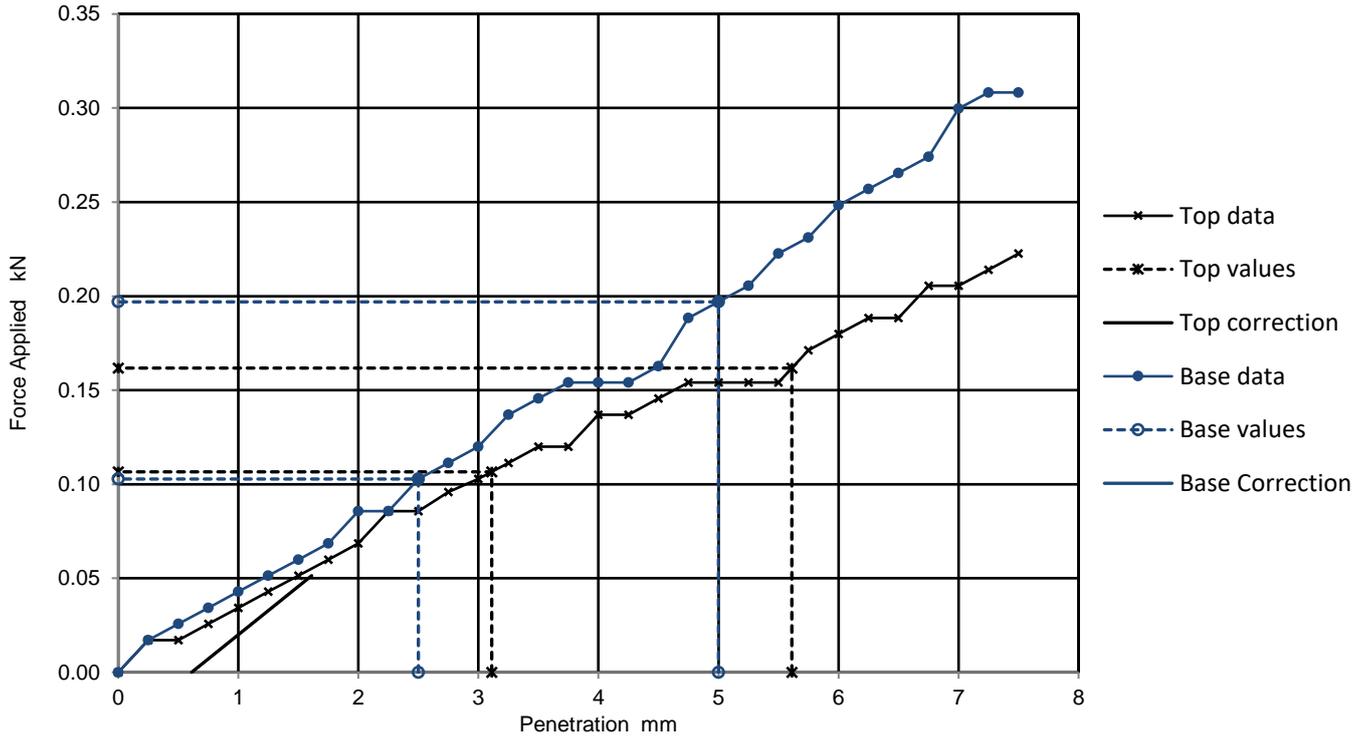
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP018
Sample No.	5
Depth m	2.40
KeyLAB ID	IDL12021120783
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown sandy very silty coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description	Sample Type	
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.33	Mg/m3
	Dry density	2.12	Mg/m3
	Moisture content	10.0	%
		Surcharge applied	2 kg
			1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	Yes	0.8	0.8	0.8	0.9	9.8
BASE	No	0.8	1.0	1.0		10.0

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	8

Lab Sheet Reference :



California Bearing Ratio (CBR)

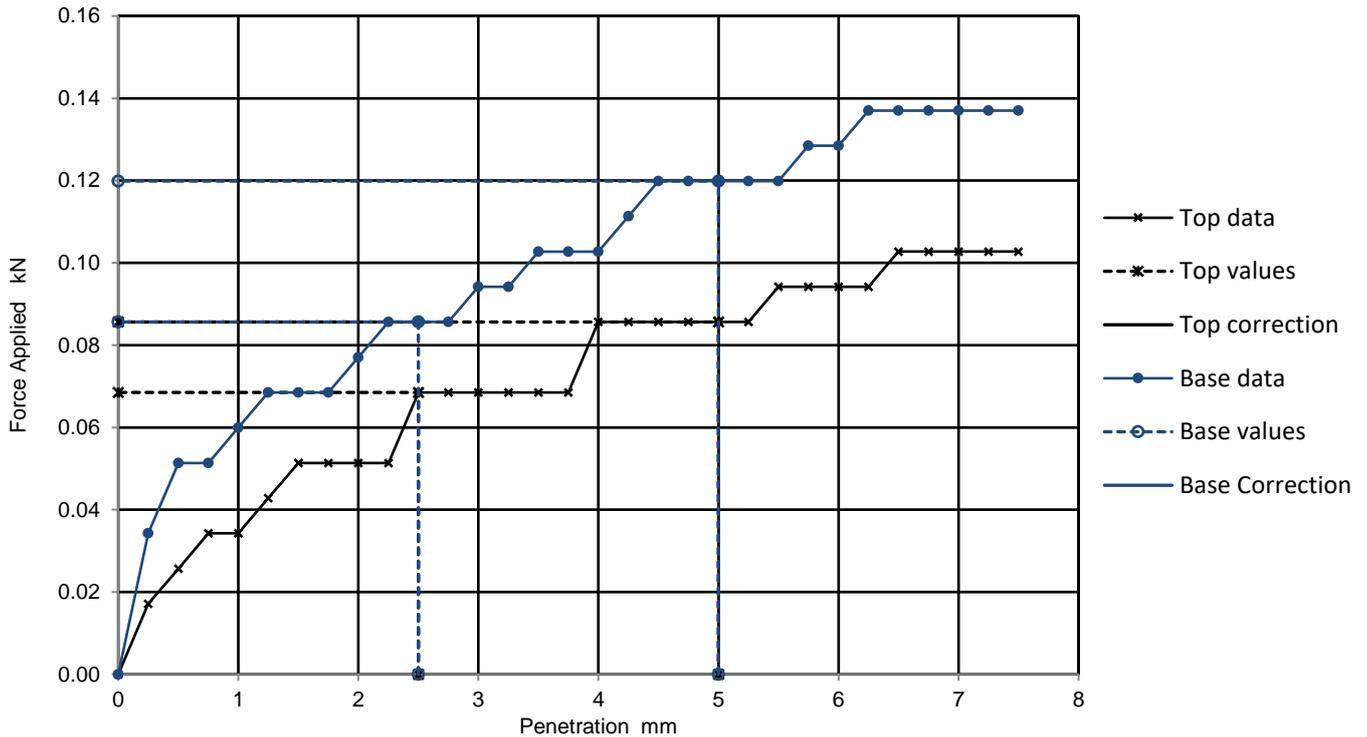
Job Ref	2021OY102
Borehole/Pit No.	BPS-TP025
Sample No.	3
Depth m	2.50
Sample Type	B
KeyLAB ID	IDL12022020414
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown very sandy very silty medium GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	12 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.29 Mg/m3	Surcharge applied
	Dry density	2.10 Mg/m3	2 kg
	Moisture content	8.9 %	1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	0.5	0.4	0.5	11.8	
BASE	No	0.7	0.6	0.7		8.9

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	9

Lab Sheet Reference :



California Bearing Ratio (CBR)

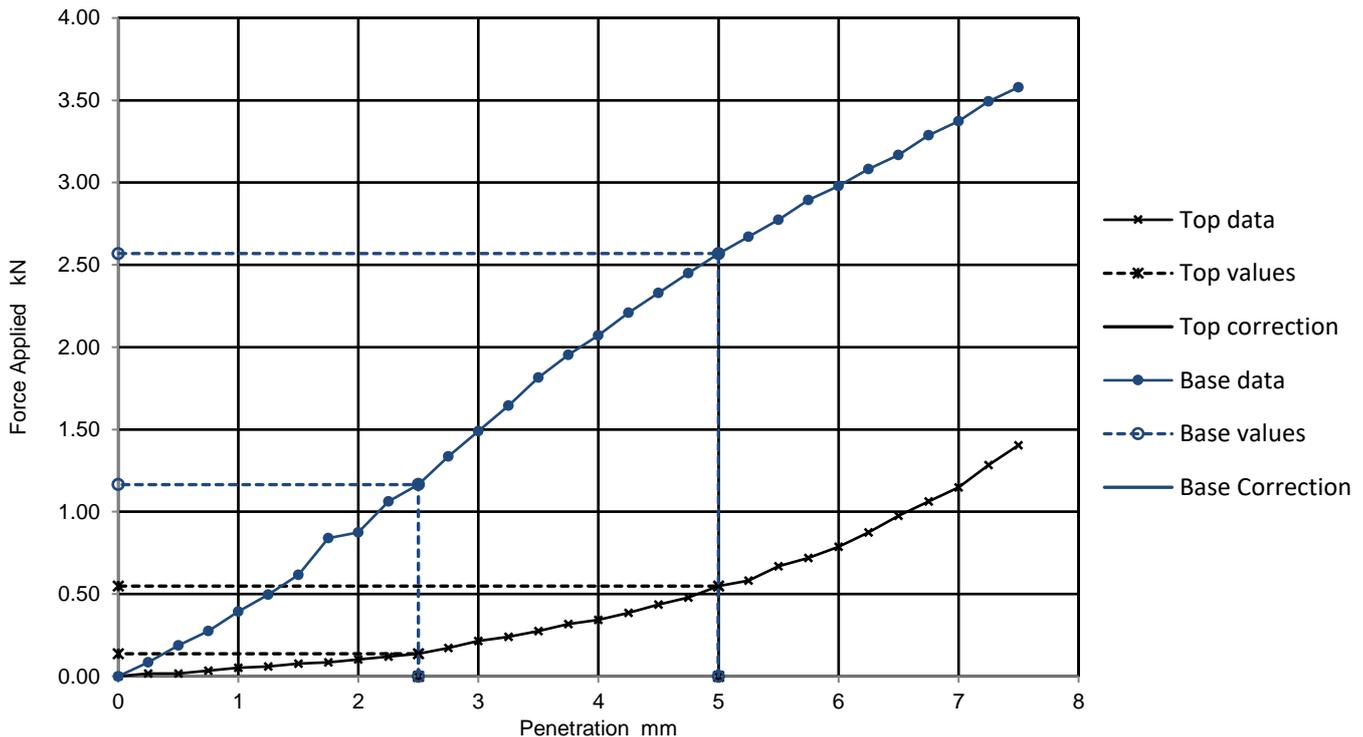
Job Ref	2021OY102
Borehole/Pit No.	BPS-TPINF001
Sample No.	3
Depth m	1.20
Sample Type	B
KeyLAB ID	IDL120211206224
CBR Test Number	1

Site Name	WSP Eastern & Midlands Region	
Soil Description	Light brown silty medium SAND and coarse GRAVEL.	
Specimen Reference	Specimen Depth	m
Specimen Description		
Test Method	BS1377 : Part 4 : 1990, clause 7	

Specimen Preparation

Condition	REMOULDED	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
		Amount of swell recorded	mm
Material retained on 20mm sieve removed	9 %	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	1.86 Mg/m3	Surcharge applied
	Dry density	1.65 Mg/m3	2 kg
	Moisture content	12.5 %	1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	1.0	2.7	2.7		12.5
BASE	No	8.8	13.0	13.0		11.9

General remarks	Test specific remarks	Approved

Fig No.	1
QC From R9	
Sheet No	10

Lab Sheet Reference :

SHEAR BOX TEST

Test Method

BS 1377 : Part 7 : 1990 : Method 4

Preparation procedure

Remoulded with 2.5kg Rammer at natural moisture content

Description

Grey/brown slightly sandy slightly gravelly clayey SILT.

Weighings

		Stage 1	Stage 2	Stage 3	Nominal Dimensions		
Wet soil	gms	349.5	349.2	349.7	Length	L1 mm	60
Dry soil	gms	175.1	175.2	175.4		L2 mm	60
					Area	A mm ²	3600
Wet soil	gms	195.1	194.8	195.3	Height	H mm	24.89
Dry soil	gms	175.1	175.2	175.4	Volume	V cm ³	89.604
Water	gms	20.0	19.6	19.9	Particle density	Mg/m ³	2.70
Moisture Content (%)		11.4	11.2	11.3			

Bulk Density (Mg/m³)

2.18 2.17 2.18

Dry density (Mg/m³)

1.95 1.95 1.96

Voids ratio e

0.3815 0.3811 0.3793

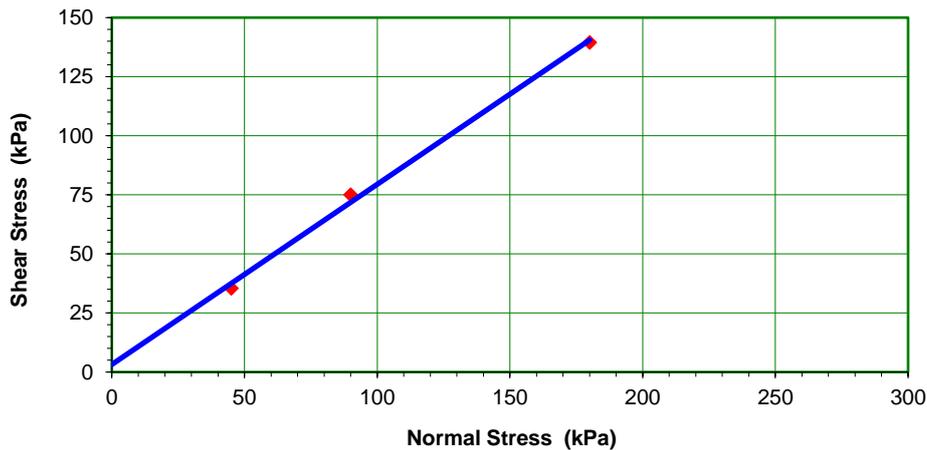
Degree of saturation (%)

80.9 79.3 80.7

Final Details

	Stage 1	Stage 2	Stage 3	
Normal Loads(kPa)	45	90	180	
Shear stress (kPa)	35.4	75.0	139.4	
Horizontal Displacement (mm)	2.031	1.996	2.642	
Vertical displacement (mm)	-0.055	0.032	-0.072	
Rate of displacement (mm/min)		0.0060		
Date sampled	n/a			Peak
Date received	26/04/2022		Cohesion c' (kPa)	3.19
Date tested	03/05/2022		Friction angle phi'	37.3°

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Operator Sb

Consolidated drained Shear Box Test
in 60 mm square Box

Project WSP Eastern & Midlands Region-2021OY102

Checked Nc Approved Bc

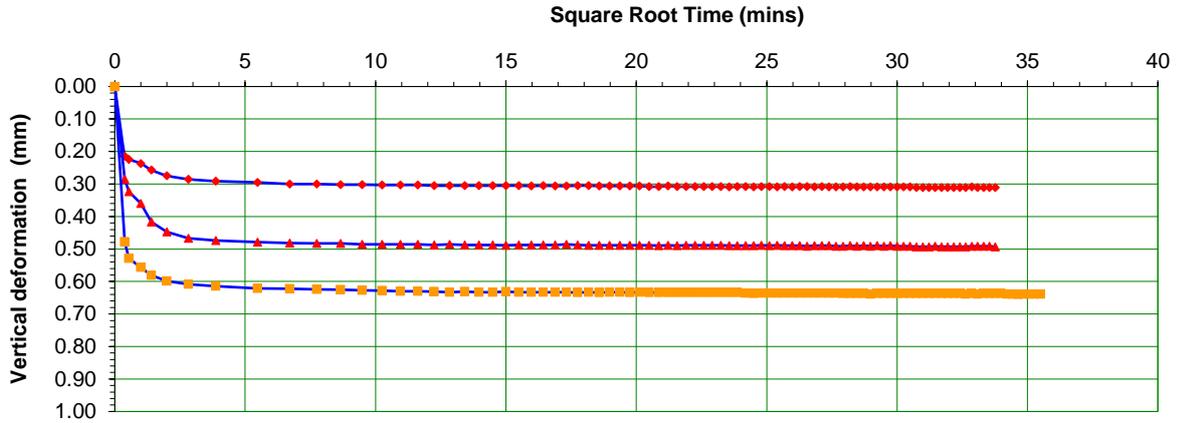
Job No. NMTL_3535

Borehole Nc BPS-BH002

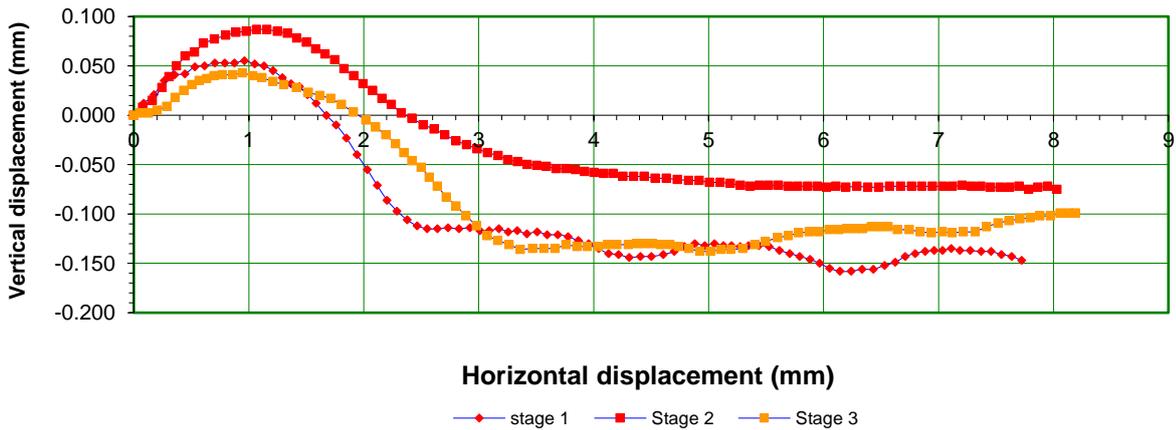
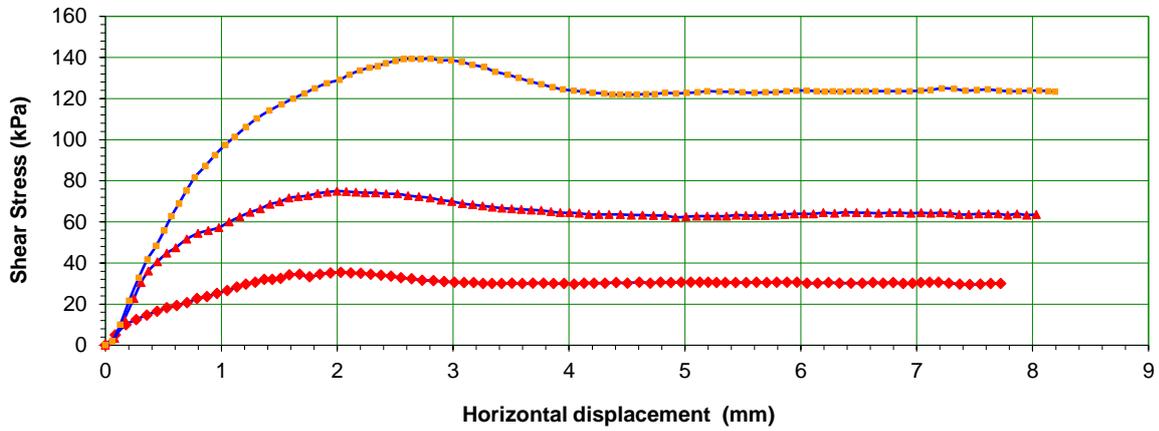
Sample No. B13

Depth. 4.00-4.50m

CONSOLIDATION STAGE



SHEAR STAGE



NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No. NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole No. BPS-BH002
Operator Sb	Checked Nc	Approved Bc	Sample No. B13
			Depth. 4.00-4.50m

SHEAR BOX TEST

Test Method

BS 1377 : Part 7 : 1990 : Method 4

Preparation procedure

Remoulded with 2.5kg Rammer at natural moisture content

Description

Grey/brown slightly sandy slightly gravelly CLAY/SILT

Weighings

		Stage 1	Stage 2	Stage 3	Nominal Dimensions		
Wet soil	gms	342.5	342.4	342.9	Length	L1 mm	60
Dry soil	gms	160.0	160.6	160.7		L2 mm	60
					Area	A mm ²	3600
Wet soil	gms	188.1	187.9	188.5	Height	H mm	24.89
Dry soil	gms	160.0	160.6	160.7	Volume	V cm ³	89.604
Water	gms	28.2	27.3	27.8	Particle density	Mg/m ³	2.70
Moisture Content (%)		17.6	17.0	17.3			

Bulk Density (Mg/m³)

2.10 2.10 2.10

Dry density (Mg/m³)

1.79 1.79 1.79

Void ratio e

0.5125 0.5065 0.5059

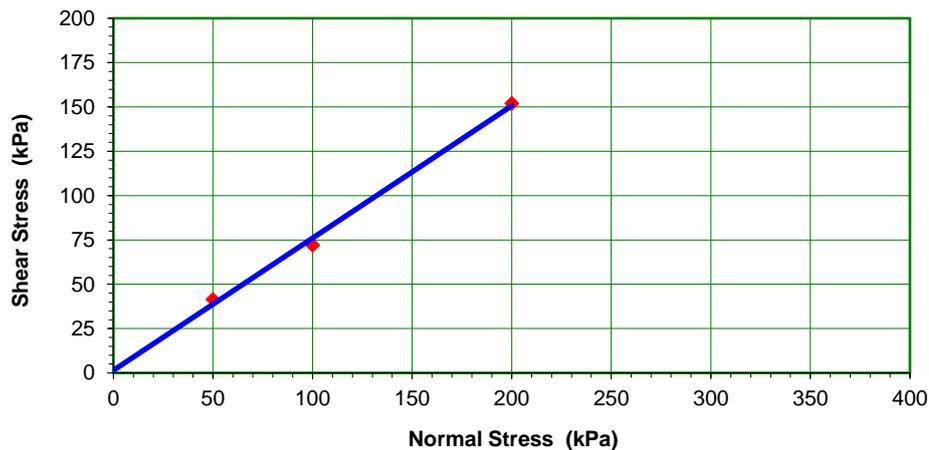
Degree of saturation (%)

92.8 90.7 92.3

Final Details

	Stage 1	Stage 2	Stage 3	
Normal Loads(kPa)	50	100	200	
Shear stress (kPa)	41.4	72.1	151.9	
Horizontal Displacement (mm)	3.010	2.421	3.166	
Vertical displacement (mm)	-0.061	-0.127	0.083	
Rate of displacement (mm/min)		0.0060		
Date sampled	n/a			Peak
Date received	26/04/2022		Cohesion c' (kPa)	1.46
Date tested	06/05/2022		Friction angle phi'	36.7°

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Consolidated drained Shear Box Test
in 60 mm square Box

Job No. NMTL_3535
Borehole Nc BPS-BH004

Project WSP Eastern & Midlands Region-2021OY102

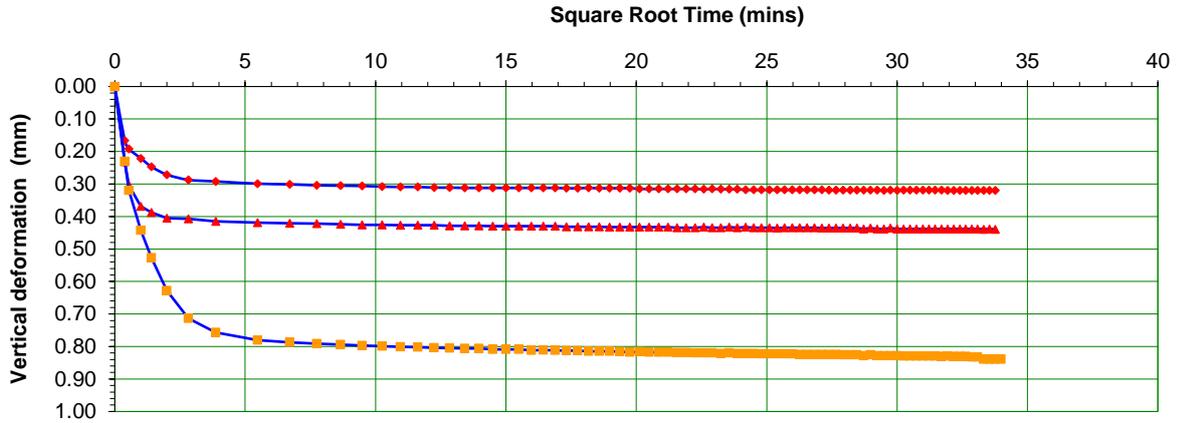
Sample No. B16

Operator Sb

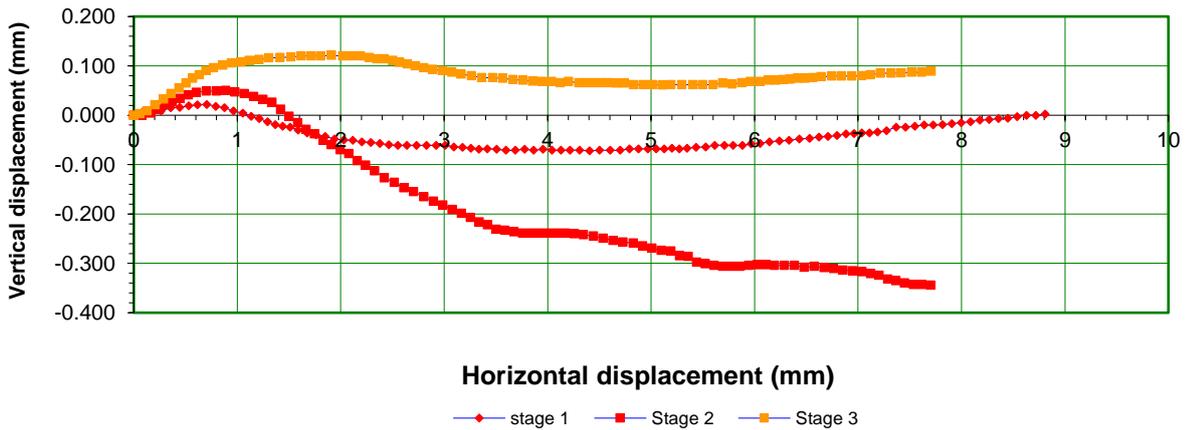
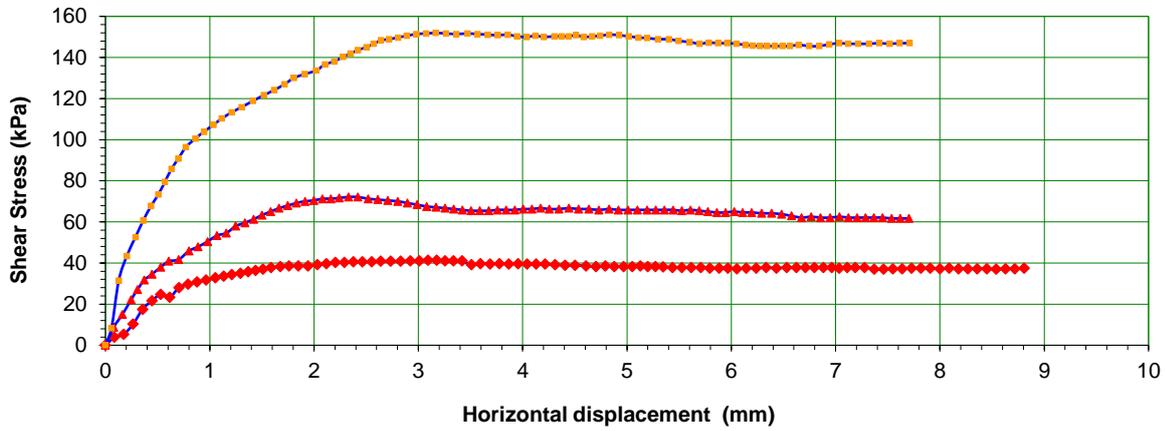
Checked Nc Approved Bc

Depth. 5.0-5.50m

CONSOLIDATION STAGE



SHEAR STAGE



NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No. NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole No. BPS-BH004
Operator Sb	Checked Nc	Approved Bc	Sample No. B16
			Depth. 5.0-5.50m

SHEAR BOX TEST

Test Method

BS 1377 : Part 7 : 1990 : Method 4

Preparation procedure

Remoulded with 2.5kg Rammer at natural moisture content

Description

Light grey/brown slightly sandy slightly gravelly CLAY/SILT

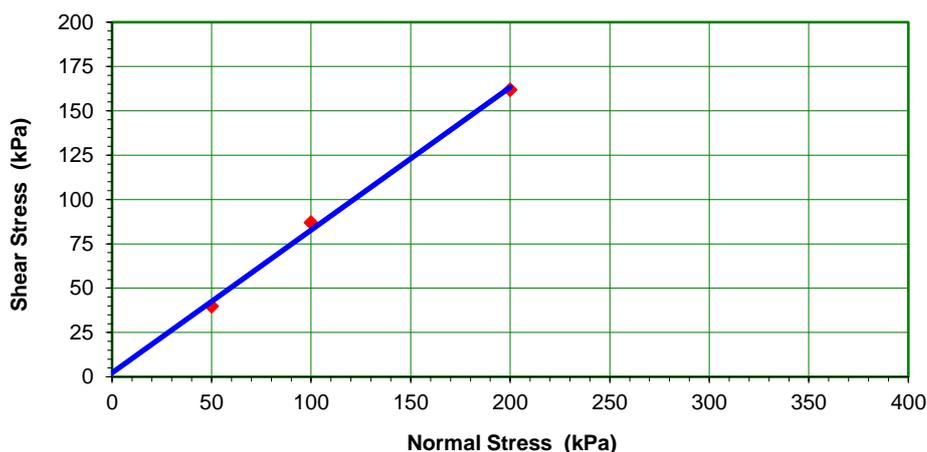
Weighings

		Stage 1	Stage 2	Stage 3	Nominal Dimensions		
Wet soil	gms	354.4	351.8	353.8	Length	L1 mm	60
Dry soil	gms	180.4	179.1	181.0		L2 mm	60
					Area	A mm ²	3600
Wet soil	gms	200.0	197.3	199.4	Height	H mm	24.76
Dry soil	gms	180.4	179.1	181.0	Volume	V cm ³	89.136
Water	gms	19.5	18.3	18.4	Particle density	Mg/m ³	2.70
Moisture Content (%)		10.8	10.2	10.2			
Bulk Density (Mg/m ³)		2.24	2.21	2.24			
Dry density (Mg/m ³)		2.02	2.01	2.03			
Voids ratio e		0.3338	0.3440	0.3299			
Degree of saturation (%)		87.6	80.1	83.2			

Final Details

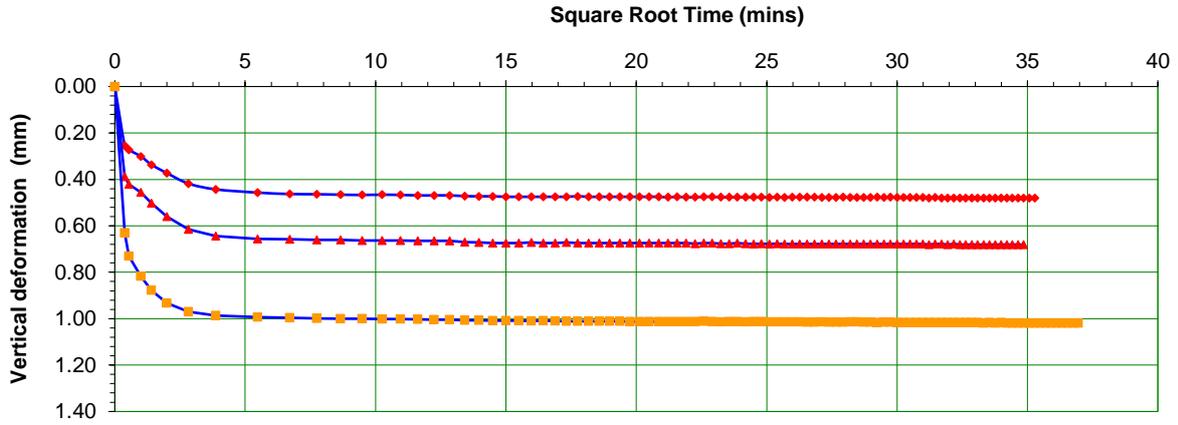
	Stage 1	Stage 2	Stage 3	
Normal Loads(kPa)	50	100	200	
Shear stress (kPa)	39.8	86.9	161.9	
Horizontal Displacement (mm)	3.126	3.169	3.665	
Vertical displacement (mm)	0.017	-0.127	-0.110	
Rate of displacement (mm/min)		0.0060		
Date sampled	n/a			Peak
Date received	26/04/2022		Cohesion c' (kPa)	2.25
Date tested	09/05/2022		Friction angle phi'	38.8°

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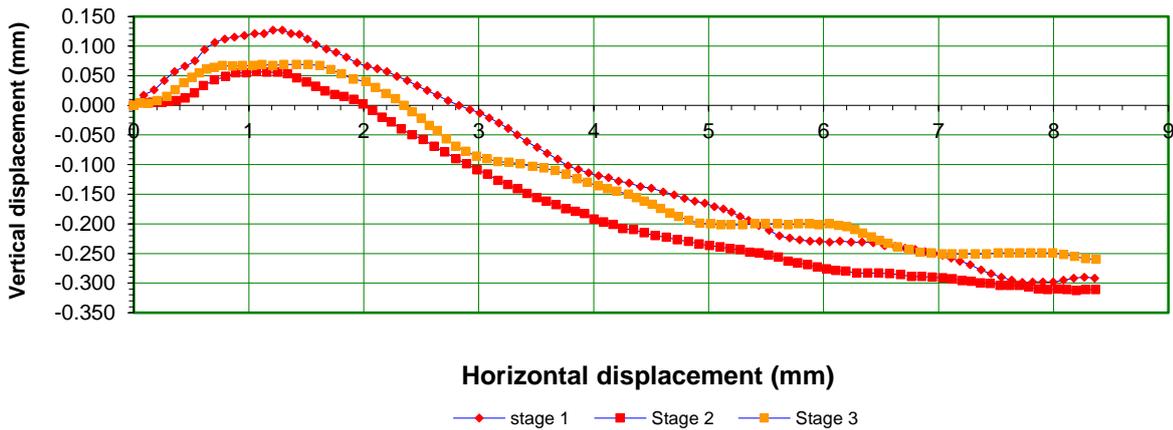
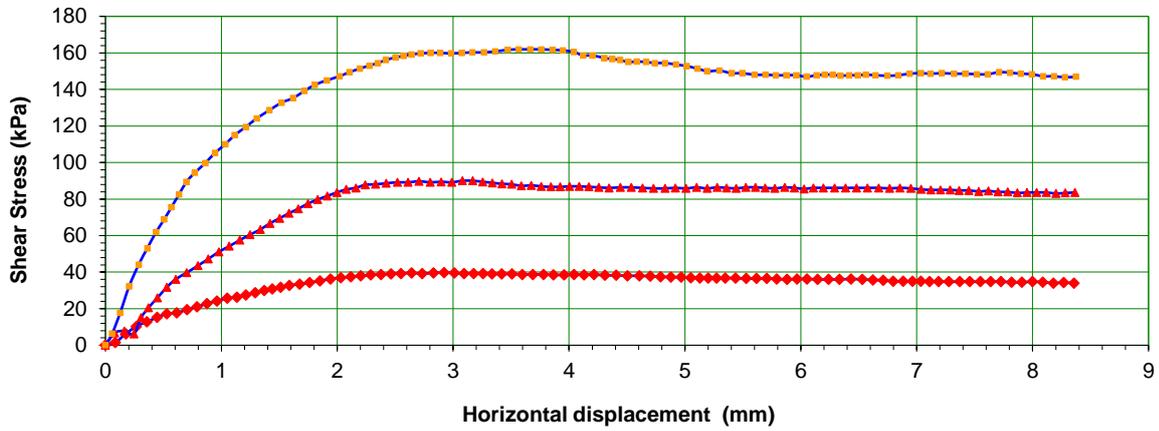


NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No. NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole Nc BPS-BH006
Operator Sb	Checked Nc	Approved Bc	Sample No. B13
			Depth. 4.00-4.50m

CONSOLIDATION STAGE



SHEAR STAGE



NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No. NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole No. BPS-BH006
Operator Sb	Checked Nc	Approved Bc	Sample No. B13
			Depth. 4.00-4.50m

SHEAR BOX TEST

Test Method

BS 1377 : Part 7 : 1990 : Method 4

Preparation procedure

Remoulded with 2.5kg Rammer at natural moisture content

Description

Light grey/brown slightly sandy slightly gravelly CLAY/SILT

Weighings

		Stage 1	Stage 2	Stage 3	Nominal Dimensions		
Wet soil	gms	346.5	346.6	346.0	Length	L1 mm	60
Dry soil	gms	162.8	162.9	162.6		L2 mm	60
					Area	A mm ²	3600
Wet soil	gms	192.1	192.1	191.5	Height	H mm	25
Dry soil	gms	162.8	162.9	162.6	Volume	V cm ³	90
Water	gms	29.3	29.2	28.9	Particle density	Mg/m ³	2.70
Moisture Content (%)		18.0	17.9	17.8			

Bulk Density (Mg/m³)

2.13 2.13 2.13

Dry density (Mg/m³)

1.81 1.81 1.81

Voids ratio e

0.4926 0.4917 0.4949

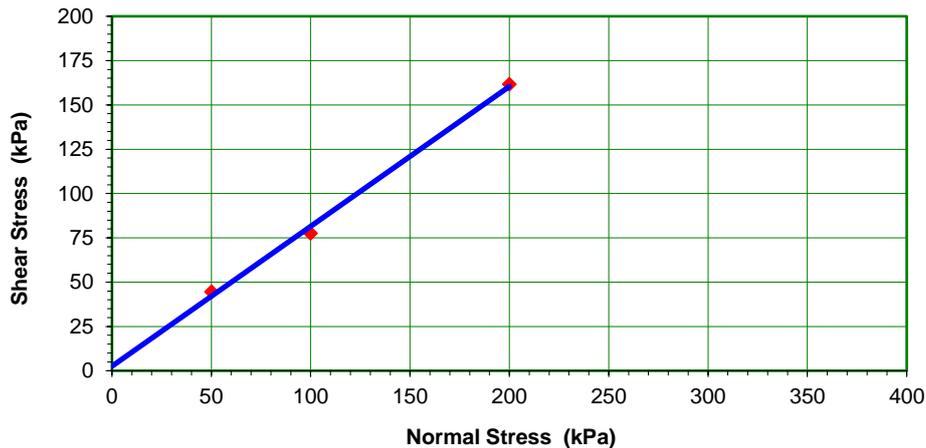
Degree of saturation (%)

98.6 98.4 97.1

Final Details

	Stage 1	Stage 2	Stage 3	
Normal Loads(kPa)	50	100	200	
Shear stress (kPa)	44.6	77.6	161.7	
Horizontal Displacement (mm)	3.508	3.842	3.075	
Vertical displacement (mm)	-0.308	-0.153	-0.008	
Rate of displacement (mm/min)		0.0060		
Date sampled	n/a			Peak
Date received	26/04/2022		Cohesion c' (kPa)	2.55
Date tested	13/05/2022		Friction angle phi'	38.3°

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Consolidated drained Shear Box Test
in 60 mm square Box

Project WSP Eastern & Midlands Region-2021OY102

Job No. NMTL_3535

Borehole No. BPS-BH007

Sample No. B16

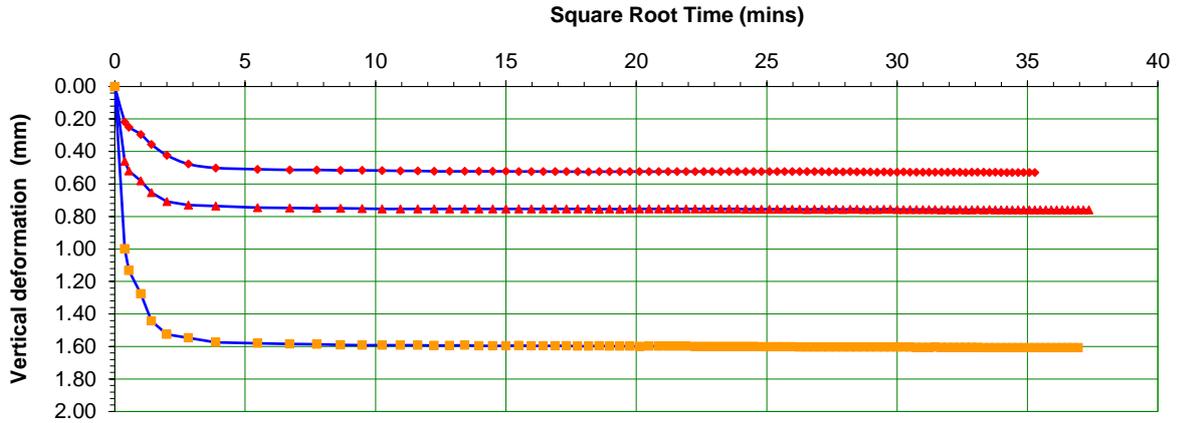
Operator Sb

Checked Nc

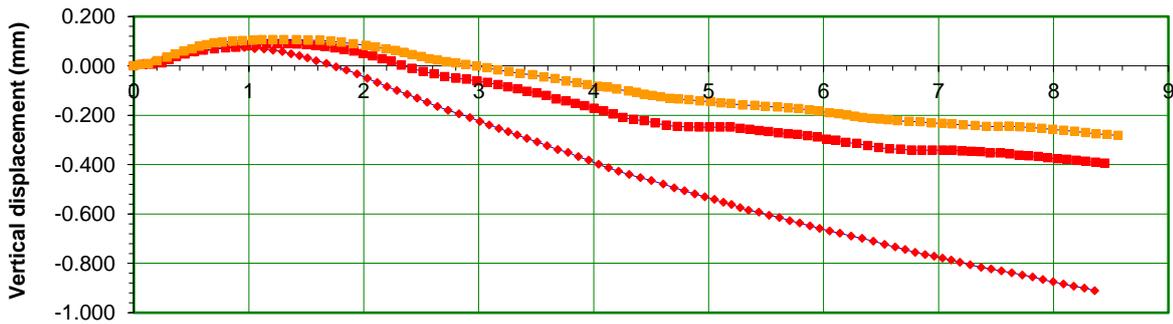
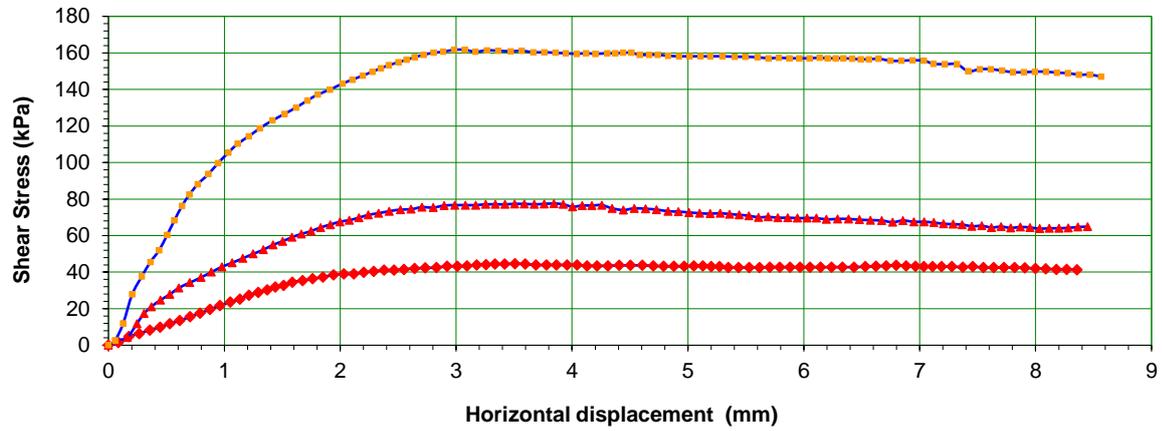
Approved Bc

Depth. 5.0-5.50m

CONSOLIDATION STAGE



SHEAR STAGE



Horizontal displacement (mm)

—◆— stage 1 —▲— Stage 2 —■— Stage 3

NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No. NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole No. BPS-BH007
Operator Sb	Checked Nc	Approved Bc	Sample No. B16
			Depth. 5.0-5.50m

SHEAR BOX TEST

Test Method

BS 1377 : Part 7 : 1990 : Method 4

Preparation procedure

Remoulded with 2.5kg Rammer at natural moisture content

Description

Light brown/grey slightly sandy slightly gravelly clayey SILT

Weighings

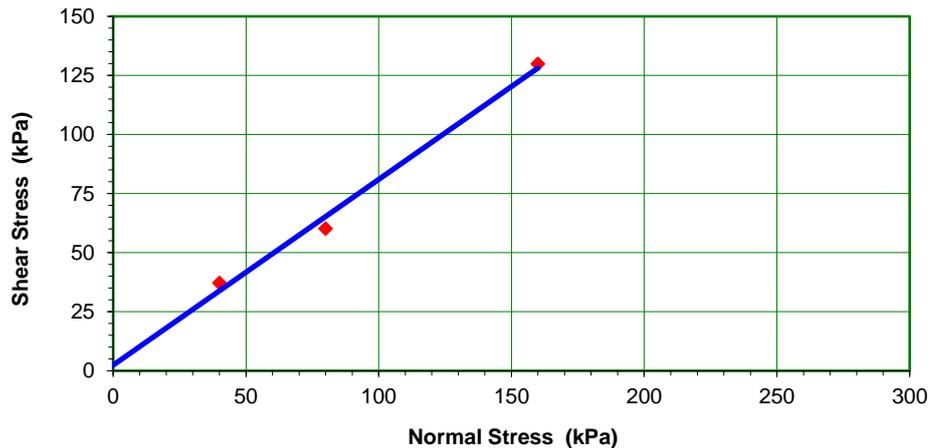
		Stage 1	Stage 2	Stage 3	Nominal Dimensions		
Wet soil	gms	352.1	352.6	352.3	Length	L1 mm	60
Dry soil	gms	178.0	178.7	178.3		L2 mm	60
					Area	A mm ²	3600
Wet soil	gms	197.7	198.2	197.9	Height	H mm	25
Dry soil	gms	178.0	178.7	178.3	Volume	V cm ³	90
Water	gms	19.7	19.5	19.6	Particle density	Mg/m ³	2.70
Moisture Content (%)		11.1	10.9	11.0			

Bulk Density (Mg/m ³)	2.20	2.20	2.20
Dry density (Mg/m ³)	1.98	1.99	1.98
Voids ratio e	0.3652	0.3599	0.3633
Degree of saturation (%)	81.7	81.7	81.8

Final Details

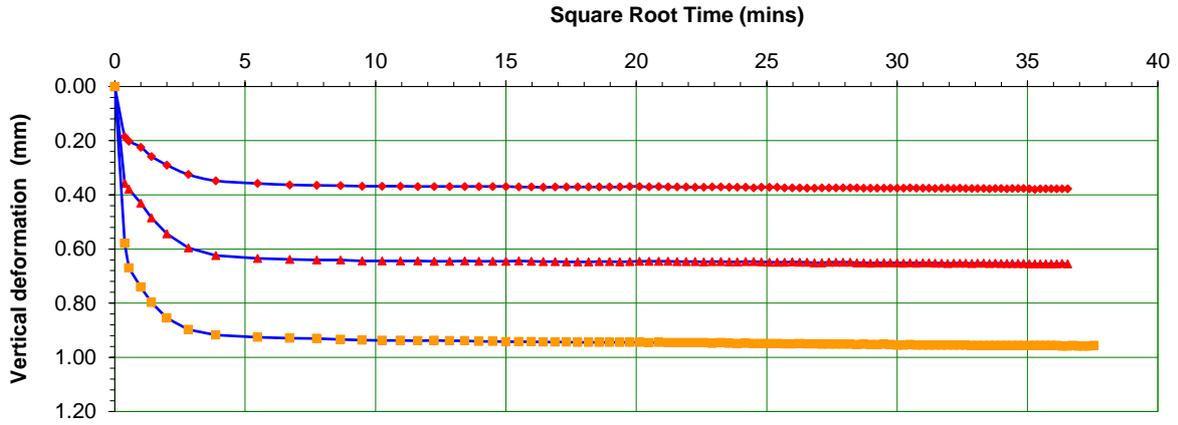
	Stage 1	Stage 2	Stage 3	
Normal Loads(kPa)	40	80	160	
Shear stress (kPa)	37.2	60.2	129.9	
Horizontal Displacement (mm)	2.641	2.426	2.260	
Vertical displacement (mm)	-0.060	-0.054	-0.095	
Rate of displacement (mm/min)		0.0060		
Date sampled	n/a			Peak
Date received	26/04/2022		Cohesion c' (kPa)	2.41
Date tested	15/05/2022		Friction angle phi'	38.2°

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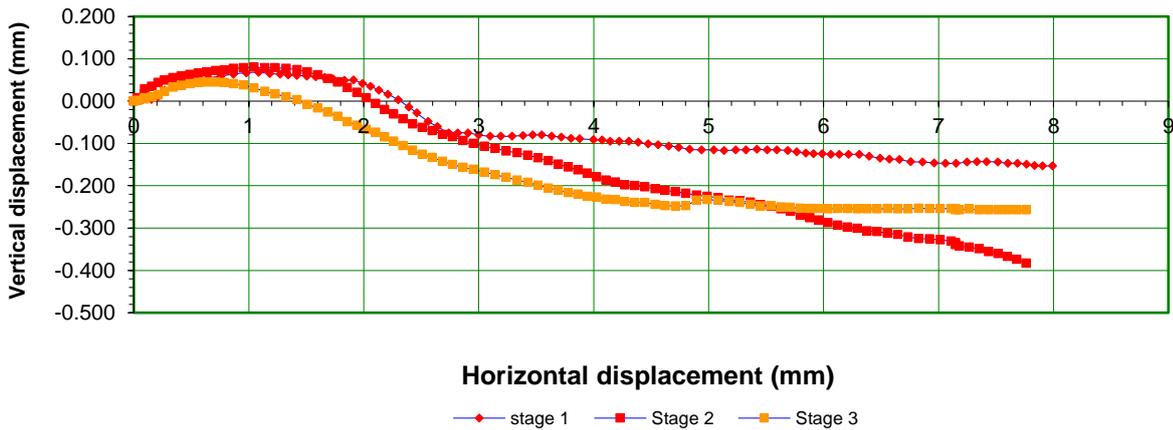
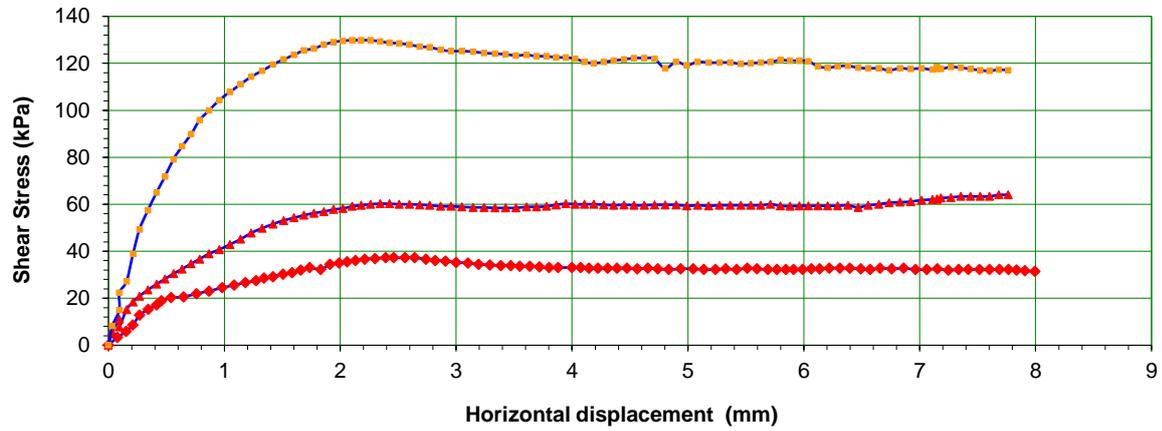


NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No.	NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole No.	BPS-TP028
Operator Sb			Checked Nc	Approved Bc
			Depth.	3.50-4.00m

CONSOLIDATION STAGE



SHEAR STAGE



NM T L Ltd	Consolidated drained Shear Box Test in 60 mm square Box		Job No. NMTL_3535
	Project WSP Eastern & Midlands Region-2021OY102		Borehole No. BPS-TP028
Operator Sb	Checked Nc	Approved Bc	Sample No. B5
			Depth. 3.50-4.00m



Unit 7-8 Hawarden Business Park
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Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

Irish Drilling Limited
Old Galway Road
Loughrea
Co. Galway

Attention: Dympna Darcy

CERTIFICATE OF ANALYSIS

Date of report Generation: 21 April 2022
Customer: Irish Drilling Limited
Sample Delivery Group (SDG): 220407-114
Your Reference: 2021OY102
Location: WSP Lot2: Eastern and Midlands
Report No: 643216
Order Number: 10808

We received 20 samples on Thursday April 07, 2022 and 20 of these samples were scheduled for analysis which was completed on Thursday April 21, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-114
Client Ref.: 2021OY102

Report Number: 643216

Superseded Report:

Location: WSP Lot2: Eastern and Midlands

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26099680	BPS-BH001	D14	4.50 - 4.50	28/01/2022
26099717	BPS-BH004	D14	4.50 - 4.50	31/01/2022
26099721	BPS-BH006	D11	3.50 - 3.50	04/02/2022
26099723	BPS-BH008	D5	1.50 - 1.50	26/01/2022
26099729	BPS-BH010	D5	1.50 - 1.50	24/01/2022
26099734	BPS-TP001	D6	2.30 - 2.30	25/11/2021
26099738	BPS-TP002	D4	1.80 - 1.80	25/11/2021
26099740	BPS-TP003	D4	1.50 - 1.50	24/11/2021
26099742	BPS-TP004	D4	0.80 - 0.80	23/11/2021
26099685	BPS-TP006	D6	1.80 - 1.80	23/11/2021
26099687	BPS-TP007	D4	1.80 - 1.80	24/11/2021
26099696	BPS-TP009	D4	1.50 - 1.50	25/11/2021
26099698	BPS-TP011	D6	2.60 - 2.60	24/11/2021
26099702	BPS-TP012	D8	4.30 - 4.30	23/11/2021
26099705	BPS-TP016	D6	2.50 - 2.50	25/11/2021
26099707	BPS-TP018	D8	3.80 - 3.80	26/11/2021
26099709	BPS-TP026	D4	1.50 - 1.50	26/11/2021
26099712	BPS-TPINF001	D4	1.50 - 1.50	24/11/2021
26099714	TP-39906	D4	1.20 - 1.20	28/09/2021
26099719	TP-40305	D1	0.40 - 0.40	30/09/2021

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-114
Client Ref.: 2021OY102

Report Number: 643216
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Results Legend	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
<p>X Test</p> <p>N No Determination Possible</p> <p>Sample Types -</p> <p>S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</p>	26099714	TP-39906	D4	1.20 - 1.20	250g Amber Jar (ALE210)	S
	26099712	BPS-TP-INF001	D4	1.50 - 1.50	250g Amber Jar (ALE210)	S
	26099709	BPS-TP026	D4	1.50 - 1.50	250g Amber Jar (ALE210)	S
	26099707	BPS-TP018	D8	3.80 - 3.80	250g Amber Jar (ALE210)	S
	26099705	BPS-TP016	D6	2.50 - 2.50	250g Amber Jar (ALE210)	S
	26099702	BPS-TP012	D8	4.30 - 4.30	250g Amber Jar (ALE210)	S
	26099698	BPS-TP011	D6	2.60 - 2.60	250g Amber Jar (ALE210)	S
	26099696	BPS-TP009	D4	1.50 - 1.50	250g Amber Jar (ALE210)	S
	26099687	BPS-TP007	D4	1.80 - 1.80	250g Amber Jar (ALE210)	S
	26099685	BPS-TP006	D6	1.80 - 1.80	250g Amber Jar (ALE210)	S
	26099742	BPS-TP004	D4	0.80 - 0.80	250g Amber Jar (ALE210)	S
	26099740	BPS-TP003	D4	1.50 - 1.50	250g Amber Jar (ALE210)	S
	26099738	BPS-TP002	D4	1.80 - 1.80	250g Amber Jar (ALE210)	S
	26099734	BPS-TP001	D6	2.30 - 2.30	250g Amber Jar (ALE210)	S
	26099729	BPS-BH010	D5	1.50 - 1.50	250g Amber Jar (ALE210)	S
	26099723	BPS-BH008	D5	1.50 - 1.50	250g Amber Jar (ALE210)	S
	26099721	BPS-BH006	D11	3.50 - 3.50	250g Amber Jar (ALE210)	S
	26099717	BPS-BH004	D14	4.50 - 4.50	250g Amber Jar (ALE210)	S
	26099680	BPS-BH001	D14	4.50 - 4.50	250g Amber Jar (ALE210)	S
Anions in soil by IC	All	NDPs: 0 Tests: 19				
pH	All	NDPs: 0 Tests: 19				
Sample description	All	NDPs: 0 Tests: 20				
Total Organic Carbon	All	NDPs: 0 Tests: 1				
Total Sulphate	All	NDPs: 0 Tests: 19				
Total Sulphur	All	NDPs: 0 Tests: 19				



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-114
Client Ref.: 2021OY102

Report Number: 643216
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
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Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26099680	BPS-BH001	4.50 - 4.50	Light Brown	Sandy Clay Loam	Stones	None
26099717	BPS-BH004	4.50 - 4.50	Light Brown	Sand	None	None
26099721	BPS-BH006	3.50 - 3.50	Light Brown	Sandy Clay Loam	Stones	None
26099723	BPS-BH008	1.50 - 1.50	Light Brown	Sandy Loam	Stones	None
26099729	BPS-BH010	1.50 - 1.50	Light Brown	Sandy Clay Loam	Stones	None
26099734	BPS-TP001	2.30 - 2.30	Light Brown	Loamy Sand	Stones	Vegetation
26099738	BPS-TP002	1.80 - 1.80	Light Brown	Sandy Silt Loam	Stones	None
26099740	BPS-TP003	1.50 - 1.50	Light Brown	Loamy Sand	Stones	None
26099742	BPS-TP004	0.80 - 0.80	Light Brown	Sand	Stones	None
26099685	BPS-TP006	1.80 - 1.80	Light Brown	Sand	None	None
26099687	BPS-TP007	1.80 - 1.80	Light Brown	Loamy Sand	Vegetation	Stones
26099696	BPS-TP009	1.50 - 1.50	Light Brown	Loamy Sand	Stones	None
26099698	BPS-TP011	2.60 - 2.60	Light Brown	Sandy Silt Loam	Stones	None
26099702	BPS-TP012	4.30 - 4.30	Dark Brown	Loamy Sand	Stones	None
26099705	BPS-TP016	2.50 - 2.50	Light Brown	Loamy Sand	Stones	Vegetation
26099707	BPS-TP018	3.80 - 3.80	Light Brown	Silty Clay Loam	Stones	None
26099709	BPS-TP026	1.50 - 1.50	Light Brown	Sandy Clay Loam	Stones	None
26099712	BPS-TPINF001	1.50 - 1.50	Light Brown	Sand	Stones	None
26099714	TP-39906	1.20 - 1.20	Light Brown	Loamy Sand	Stones	None
26099719	TP-40305	0.40 - 0.40	Dark Brown	Silt Loam	Vegetation	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-114
Client Ref.: 2021OY102

Report Number: 643216
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM019	Modified: US EPA Method 9056	Determination of Anions in Soils using Ion Chromatography
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid Extractable Sulphate in Soils by ICP OES

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220407-114
Client Ref.: 2021OY102

Report Number: 643216
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Test Completion Dates

Lab Sample No(s) Customer Sample Ref.	26099680	26099717	26099721	26099723	26099729	26099734	26099738	26099740	26099742	26099685
	BPS-BH001	BPS-BH004	BPS-BH006	BPS-BH008	BPS-BH010	BPS-TP001	BPS-TP002	BPS-TP003	BPS-TP004	BPS-TP006
AGS Ref.	D14	D14	D11	D5	D5	D6	D4	D4	D4	D6
Depth	4.50 - 4.50	4.50 - 4.50	3.50 - 3.50	1.50 - 1.50	1.50 - 1.50	2.30 - 2.30	1.80 - 1.80	1.50 - 1.50	0.80 - 0.80	1.80 - 1.80
Type	Soil/Solid (S)									
Anions in soil by IC	13-Apr-2022	13-Apr-2022	13-Apr-2022	13-Apr-2022	14-Apr-2022	13-Apr-2022	13-Apr-2022	14-Apr-2022	14-Apr-2022	13-Apr-2022
pH	12-Apr-2022									
Sample description	08-Apr-2022									
Total Sulphate	12-Apr-2022	12-Apr-2022	13-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	13-Apr-2022	12-Apr-2022	12-Apr-2022
Total Sulphur	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	12-Apr-2022	12-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022

Lab Sample No(s) Customer Sample Ref.	26099687	26099696	26099698	26099702	26099705	26099707	26099709	26099712	26099714	26099719
	BPS-TP007	BPS-TP009	BPS-TP011	BPS-TP012	BPS-TP016	BPS-TP018	BPS-TP026	BPS-TPINF001	TP-39906	TP-40305
AGS Ref.	D4	D4	D6	D8	D6	D8	D4	D4	D4	D1
Depth	1.80 - 1.80	1.50 - 1.50	2.60 - 2.60	4.30 - 4.30	2.50 - 2.50	3.80 - 3.80	1.50 - 1.50	1.50 - 1.50	1.20 - 1.20	0.40 - 0.40
Type	Soil/Solid (S)									
Anions in soil by IC	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	14-Apr-2022	13-Apr-2022	14-Apr-2022	13-Apr-2022	13-Apr-2022	
pH	12-Apr-2022									
Sample description	08-Apr-2022									
Total Organic Carbon										21-Apr-2022
Total Sulphate	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	13-Apr-2022	12-Apr-2022	12-Apr-2022	
Total Sulphur	14-Apr-2022	14-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	12-Apr-2022	14-Apr-2022	12-Apr-2022	14-Apr-2022	



CERTIFICATE OF ANALYSIS

SDG: 220407-114
Client Ref: 2021OY102

Report Number: 643216
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central

Aste stos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park
 Manor Road (off Manor Lane)
 Hawarden
 Deeside
 CH5 3US

Tel: (01244) 528777

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

Irish Drilling Limited
 Old Galway Road
 Loughrea
 Co. Galway

Attention: Dympna Darcy

CERTIFICATE OF ANALYSIS

Date of report Generation: 19 July 2022
Customer: Irish Drilling Limited
Sample Delivery Group (SDG): 220713-56
Your Reference: 2021OY102
Location: WSP Lot2: Eastern and Midlands
Report No: 654786
Order Number: 10808

We received 3 samples on Wednesday July 13, 2022 and 3 of these samples were scheduled for analysis which was completed on Tuesday July 19, 2022. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager





CERTIFICATE OF ANALYSIS

Validated

SDG: 220713-56
Client Ref.: 2021OY102

Report Number: 654786
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26581072	BPS-BH003	C1	6.10 - 7.20	08/02/2022
26581074	BPS-BH008	C1	10.00 - 11.40	10/02/2022
26581077	BPS-BH009	C1	11.40 - 12.90	11/02/2022

Only received samples which have had analysis scheduled will be shown on the following pages.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220713-56
Client Ref.: 2021OY102

Report Number: 654786
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Results Legend	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
<p>X Test</p> <p>N No Determination Possible</p> <p>Sample Types -</p> <p>S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other</p>	26581072	BPS-BH003	C1	6.10 - 7.20	1kg TUB with Handle (ALE260)	S
	26581074	BPS-BH008	C1	10.00 - 11.40	1kg TUB with Handle (ALE260)	S
	26581077	BPS-BH009	C1	11.40 - 12.90	1kg TUB with Handle (ALE260)	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	X	X	X	
pH	All	NDPs: 0 Tests: 3	X	X	X	
Sample description	All	NDPs: 0 Tests: 3	X	X	X	
Total Sulphate	All	NDPs: 0 Tests: 3	X	X	X	
Total Sulphur	All	NDPs: 0 Tests: 3	X	X	X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 220713-56
Client Ref.: 2021OY102

Report Number: 654786
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
26581072	BPS-BH003	6.10 - 7.20	Light Brown	Silty Sand	Stones	None
26581074	BPS-BH008	10.00 - 11.40	Light Brown	Silty Sand	Stones	None
26581077	BPS-BH009	11.40 - 12.90	Light Brown	Silty Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220713-56
Client Ref.: 2021OY102

Report Number: 654786
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid Extractable Sulphate in Soils by ICP OES
TM243		Mixed Anions In Soils By Kone

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM).



CERTIFICATE OF ANALYSIS

Validated

SDG: 220713-56
Client Ref.: 2021OY102

Report Number: 654786
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26581072	26581074	26581077
Customer Sample Ref.	BPS-BH003	BPS-BH008	BPS-BH009
AGS Ref.	C1	C1	C1
Depth	6.10 - 7.20	10.00 - 11.40	11.40 - 12.90
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	19-Jul-2022	19-Jul-2022	18-Jul-2022
pH	18-Jul-2022	18-Jul-2022	18-Jul-2022
Sample description	13-Jul-2022	13-Jul-2022	13-Jul-2022
Total Sulphate	18-Jul-2022	18-Jul-2022	18-Jul-2022
Total Sulphur	19-Jul-2022	19-Jul-2022	19-Jul-2022



CERTIFICATE OF ANALYSIS

SDG: 220713-56
Client Ref: 2021OY102

Report Number: 654786
Location: WSP Lot2: Eastern and Midlands

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix 7I Photographs

Part 1 Rotary Core

Irish Drilling Ltd: Core Photos:



Irish Drilling Ltd: Core Photos:



Irish Drilling Ltd: Core Photos:



Irish Drilling Ltd: Core Photos:



Irish Drilling Ltd: Core Photos:



Appendix 7I Photographs

Part 2 Trial Pits

Irish Drilling Ltd: Trial Pit Photos:



Figure 1 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP001 (1).JPG



Figure 5 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP001 (6).JPG



Figure 2 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP001 (2).JPG



Figure 6 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP002 (1).JPG



Figure 3 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP001 (4).JPG



Figure 7 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP002 (2).JPG



Figure 4 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP001 (5).JPG



Figure 8 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP002 (4).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 9 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP002 (5).JPG



Figure 13 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP003 (4).JPG



Figure 10 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP003 (1).JPG



Figure 14 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP003 (5).JPG



Figure 11 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP003 (2).JPG



Figure 15 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP004 (1).JPG



Figure 12 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP003 (3).JPG



Figure 16 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP004 (2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 17 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP004 (3).JPG



Figure 18 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP004 (6).JPG



Figure 19 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP005 Before.JPG



Figure 20 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP005(1).JPG



Figure 21 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP005(2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 22 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP005 After.JPG



Figure 25 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP006 (4).JPG



Figure 26 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP006 (5).JPG



Figure 23 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP006 (1).JPG



Figure 27 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP007 (1).JPG



Figure 24 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP006 (2).JPG



Figure 28 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP007 (4).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 29 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP007 (5).JPG



Figure 33 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP008 (5).JPG



Figure 30 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP008 (1).JPG



Figure 34 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP009 (1).JPG



Figure 31 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP008 (2).JPG



Figure 35 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP009 (2).JPG



Figure 32 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP008 (4).JPG



Figure 36 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP009 (4).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 37 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP009 (5).JPG



Figure 41 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP011 (1).JPG



Figure 38 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP010 (1).JPG



Figure 42 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP011 (3).JPG



Figure 39 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP010 (2).JPG



Figure 43 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP011 (4).JPG



Figure 40 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP010 (4).JPG



Figure 44 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP012 (1).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 45 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP012 (2).JPG



Figure 47 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP012 (5).JPG



Figure 46 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP012 (4).JPG

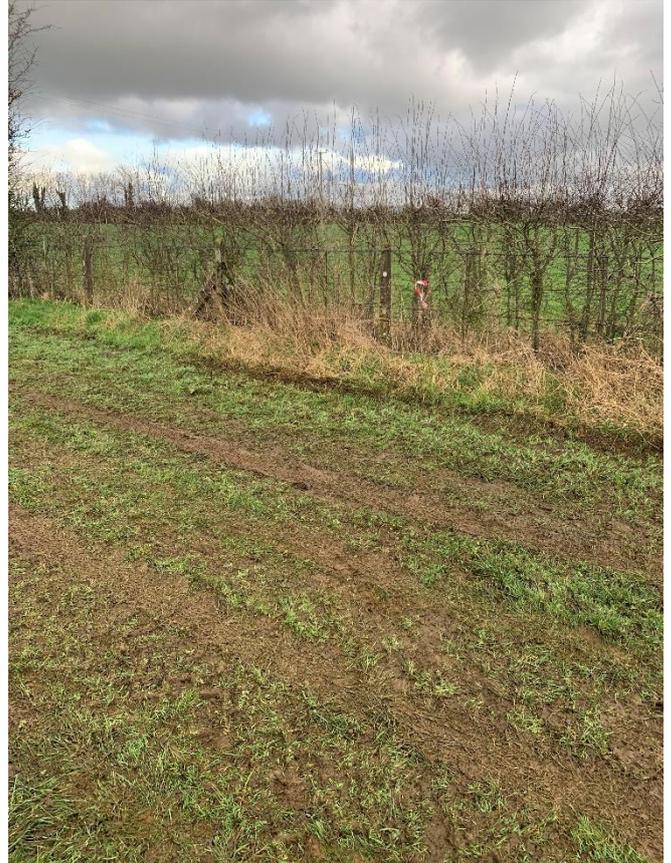


Figure 48 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP014 Before.JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 49 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP014(1).JPG



Figure 51 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP014 After.JPG



Figure 50 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP014(2).JPG



Figure 52 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP015 (1).JPG



Figure 53 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP015 (2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 54 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP015 (4).JPG



Figure 58 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP016 (4).JPG



Figure 55 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP015 (6).JPG



Figure 59 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP016 (5).JPG



Figure 56 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP016 (1).JPG



Figure 60 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP017 (1).JPG



Figure 57 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP016 (2).JPG



Figure 61 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP017 (2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 62 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP017 (4).JPG



Figure 66 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP018 (4).JPG



Figure 63 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP017 (5).JPG



Figure 67 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP018 (5).JPG



Figure 64 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP018 (1).JPG



Figure 65 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP018 (2).JPG



Figure 68 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP019 (2).jpg

Irish Drilling Ltd: Trial Pit Photos:



Figure 69 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP019 (3).jpg



Figure 71 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP019 (5).jpg



Figure 70 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP019 (4).jpg



Figure 72 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP020 (2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 73 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP020 After.JPG



Figure 75 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP020(1).JPG



Figure 74 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP020 Before.JPG



Figure 76 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP025 Before.JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 77 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP025(1).JPG



Figure 79 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP025 After.JPG



Figure 78 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP025(2).JPG



Figure 80 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP026 (1).jpg

Irish Drilling Ltd: Trial Pit Photos:



Figure 81 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP026 (2).jpg



Figure 83 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP026 (4).jpg



Figure 82 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP026 (3).jpg



Figure 84 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP027 (1).JPG



Figure 85 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP027 (2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 86 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP027 (4).JPG



Figure 87 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP027 (5).JPG



Figure 88 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP028 Before.JPG



Figure 89 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP028(1).JPG



Figure 90 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP028(2).JPG

Irish Drilling Ltd: Trial Pit Photos:



Figure 91 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTP028 After.JPG



Figure 94 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTPINF001 (3).JPG



Figure 95 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTPINF001 (4).JPG



Figure 92 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTPINF001 (1).JPG



Figure 96 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTPINF001 (5).JPG



Figure 93 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTPINF001 (2).JPG



Figure 97 H:\210Y102_WSP LOT 2\Trial_Pits_WSP\BPS Section\BPSTPINF001.JPG



Appendix 7J

Groundwater Level Data

Groundwater Levels

Contract: WSP Lot 2 BPS SITE
 Location: BPS SITE
 Client: Irish Water
 Engineer: Mott MacDonald

Test carried out by: Irish Drilling Ltd.
 Operators: DOR
 Date: 30/09/2022



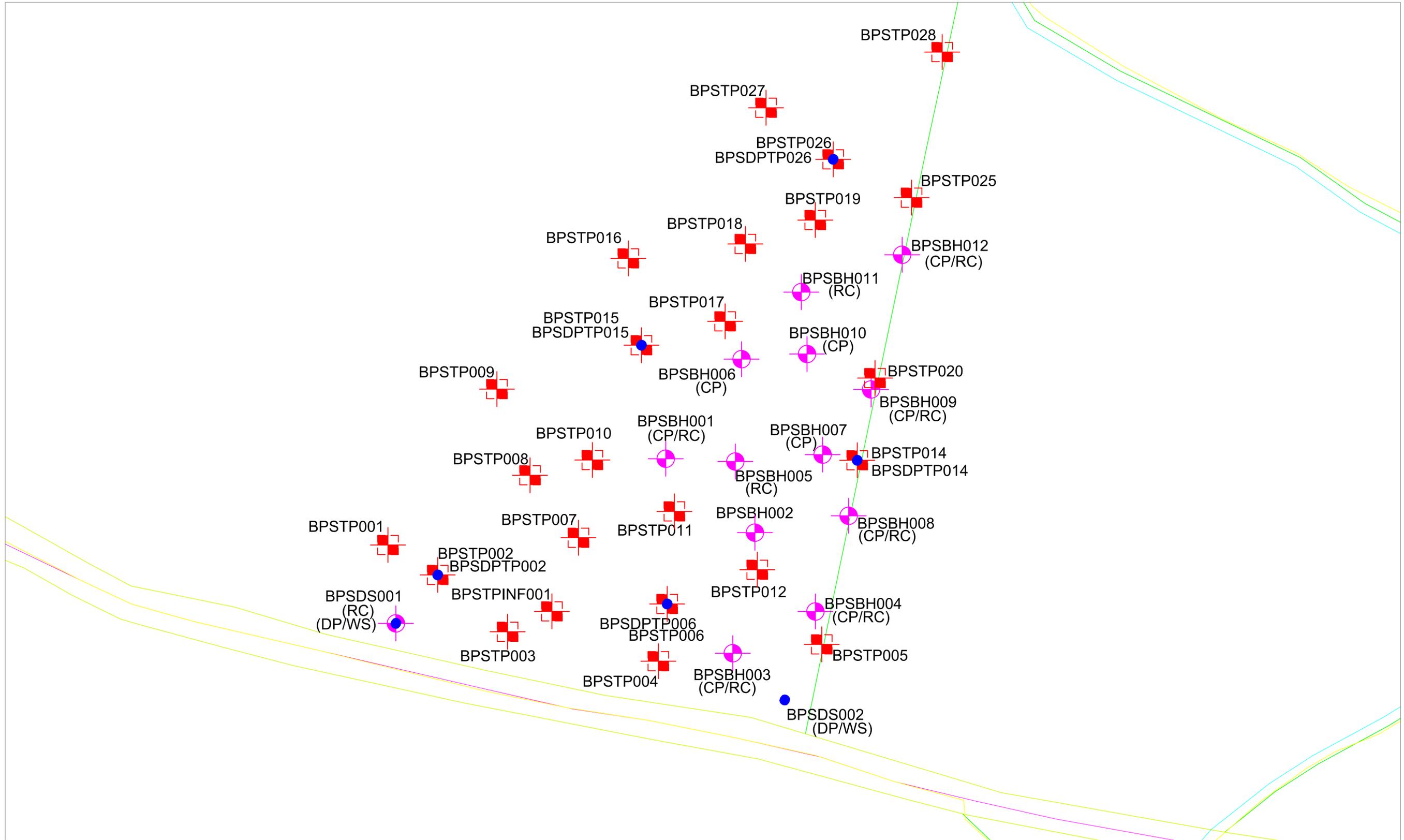
Standpipes	06/04/2022 m +/- (gl)	04/05/2022 m +/- (gl)	14/06/2022 m +/- (gl)	28/07/2022 m +/- (gl)	30/08/2022 m +/- (gl)	O.D. Ground Level
BPS BH001	-2.30m (84.35m O.D.)	-3.24m (83.41m O.D.)	-4.23m (82.42m O.D.)	-5.51m (81.14m O.D.)	-6.22m (80.43m O.D.)	86.65m
BPS BH004	-2.98m (83.99m O.D.)	-3.66m (83.31m O.D.)	-4.40m (82.57m O.D.)	-5.45m (81.52m O.D.)	-6.28m (80.69m O.D.)	86.97m
BPS BH011	-1.95m (86.22m O.D.)	-2.97m (85.20m O.D.)	-4.14m (84.03m O.D.)	-5.62m (82.55m O.D.)	DRY	88.17m
BPS BH012	-2.16m (86.76m O.D.)	-3.10m (85.82m O.D.)	-4.38m (84.54m O.D.)	-6.32m (82.60m O.D.)	-7.06m (81.86m O.D.)	88.92m

Remarks:

Data Loggers installed in all boreholes on 28/07/2022.
 Data Logger removed from BPS BH 011 on 30/08/2022.



Appendix 7K Drawings



LEGEND

SOILS/ROTARY CORE BOREHOLE LOCATION
 RC= Rotary Core
 CP=Cable Percussion

Trial Pits

Dynamic Probes+Window Sampling

BPS-BH

Client: IRISH WATER				
Title: Eastern and Midlands Water Supply Project(Lot 1)				
1 of 1				
Dimensions in. mm				
Scale: 1:500 @ A1				
Drawn By.	MM	20/07/2022	IRISH DRILLING LIMITED OLD GALWAY ROAD, LOUGHREA, CO. GALWAY Tel. 091 841274. info@irishdrilling.ie	
Checked By.	RK	20/07/2022	Drawing No.	Revision. Sheet 1
Approved By.			IDL-WSP-01	2 of 1