




Photographic Log

Client Name: ABP Development Company		Site Location: The Mole, Barry	Project No.: 413800.0000.0000
Photo No. 5	Date 27 April 2021		
Description: Monitoring well installed at CPBH101.			
Photo No. 6	Date 27 April 2021		
Description: Trial pit (TP01) on the south east corner of the Site. Underground waste material (steel sheets) unearthed.			

Photographic Log

Client Name:		Site Location:	Project No.:
ABP Development Company		The Mole, Barry	413800.0000.0000
Photo No.	Date		
7	May 2021		
Description: Trial pit (TP02) excavation encountering underground concrete slab.			
Photo No.	Date		
8	May 2021		
Description: Looking eastward at TP03 excavation, which also encountered a concrete slab underground.			

Photographic Log

Client Name:		Site Location:	Project No.:
ABP Development Company		The Mole, Barry	413800.0000.0000
Photo No.	Date		
9	May 2021		
Description: Excavation of TP04, looking east.			
Photo No.	Date		
10	May 2021		
Description: Excavation of TP05, looking east.			

Photographic Log

Client Name: ABP Development Company		Site Location: The Mole, Barry	Project No.: 413800.0000.0000
Photo No. 11	Date May 2021	<div> <p>Description:</p> <p>Excavation of TP06 on the south west corner of the Site.</p> </div> 	
Photo No. 12	Date May 2021	<div> <p>Description:</p> <p>Made ground looking into TP06.</p> </div> 	

Annex C: Exploratory Hole Logs



TRIAL PITTING LOG

TRIAL PIT NO. TP01

Page 1 of 1

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21	Date Drilling Completed: 15/2/21	Project Number: 413800
Contractor:	Excavation Method:	Surface Elev. (m) 8.52	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 167338.207000 E: 311694.585000		Personnel Logged By - Colin Morton Trial Pitter -		Excavation Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time ▽ Depth (m bgs) <u>2.8</u> Depth (m bgs)		

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
ENV1 Bulk				MADE GROUND: brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick, concrete and cobbles and boulders of concrete.			
			1	Geotextile membrane. Grey Type 1 gravel. Geotextile membrane.			Hydrocarbon odour
			2	MADE GROUND: black clayey very gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete. 3m long railway steel rail and sheet of corrugated iron recovered. MADE GROUND: light brownish grey very clayey sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse concrete. MADE GROUND: grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse concrete. MADE GROUND: greyish red clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse concrete and mudstone, and boulders and cobbles of concrete and dark brown weathered mudstone.			...Groundwater Encountered at 2.8m
ENV2 Bulk			3				
			4				
			5				

TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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TRIAL PITTING LOG

TRIAL PIT NO. TP02

Page 1 of 1

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21		Date Drilling Completed: 15/2/21		Project Number: 413800	
Contractor:		Excavation Method:		Surface Elev. (m) 8.60		TOC Elevation (m) ---	
Total Depth (m bgs) 4.0		Trial Pit Location: N: 167333.312000 E: 311629.399000		Personnel Logged By - Colin Morton Trial Pitter -		Excavation Equipment:	
Civil Town/City/or Village:		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
D				MADE GROUND: brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete and cobbles and boulders of concrete.			
ENV1				Geotextile membrane.			
Bulk				Grey Type 1 gravel.			
			1	Geotextile membrane.			
				MADE GROUND: black clayey sandy GRAVEL with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete.			Large concrete obstruction at 1.1m
			2				
			3				
			4				
			5				

TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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TRIAL PITTING LOG

TRIAL PIT NO. TP03

Page 1 of 1

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21		Date Drilling Completed: 15/2/21		Project Number: 413800			
Contractor:		Excavation Method:		Surface Elev. (m) 8.63		TOC Elevation (m) ---		Total Depth (m bgs) 4.0	
Trial Pit Location: N: 167319.845000 E: 311524.034000				Personnel Logged By - Colin Morton Trial Pitter -				Excavation Equipment:	
Civil Town/City/or Village:		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time				Depth (m bgs) Depth (m bgs)	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
NUMBER AND TYPE	RECOVERY (%)						
				MADE GROUND: brown sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, mudstone.			
			1	Geotextile membrane. Grey Type 1 gravel. Geotextile membrane. MADE GROUND: black clayey very sandy GRAVEL. Sand is fine to coarse, Gravel is sub-angular to sub-rounded, fine to coarse grained. Gravel consists of brick, concrete.			Concrete obstruction at 1.1m
			2				
			3				
			4				
			5				

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TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21



TRIAL PITTING LOG

TRIAL PIT NO. TP04

Page 1 of 1

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21	Date Drilling Completed: 15/2/21	Project Number: 413800
Contractor:	Excavation Method:	Surface Elev. (m) 8.90	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 167340.704000 E: 311498.969000		Personnel Logged By - Colin Morton Trial Pitter -		Excavation Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE	NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
	Bulk/				MADE GROUND: brown sandy gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete and occasional boulders and cobbles of concrete.			
				1	Geotextile membrane. Grey Type 1 gravel. Geotextile membrane.			
	ENV1				MADE GROUND: black clayey very gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete and boulders and cobbles of concrete.			Hydrocarbon odour
	Bulk/			2	MADE GROUND: dark blueish greenish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete and occasional cobbles and boulders of concrete.			
	ENV2			3	MADE GROUND: dark greenish grey clayey very gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse concrete.			
	Bulk/							
				4				
				5				

TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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TRIAL PITTING LOG

TRIAL PIT NO. TP05

Page 1 of 1

Facility/Project Name: The Mole, Barry				Date Drilling Started: 15/2/21		Date Drilling Completed: 15/2/21		Project Number: 413800	
Contractor:		Excavation Method:		Surface Elev. (m) 8.60		TOC Elevation (m) ---		Total Depth (m bgs) 3.0	
Trial Pit Location: N: 167321.239000 E: 311437.963000				Personnel Logged By - Martin Dorfling Trial Pitter -			Excavation Equipment:		
Civil Town/City/or Village:		County:		Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time				Depth (m bgs) Depth (m bgs)	
SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS		
NUMBER AND TYPE	RECOVERY (%)								
				MADE GROUND: light grey very silty slightly sandy CLAY. Sand is fine. Gravel is claystone.					
				Grey Type 1 gravel.					
Bulk/			1	MADE GROUND: light black clayey sandy SILT. Sand is medium grained.					
ENV1				MADE GROUND: light greyish white					
Bulk/				MADE GROUND: light greyish brown clayey very sandy GRAVEL. Sand is fine, Gravel is sub-rounded, fine grained.					
Bulk/			2	MADE GROUND: brown slightly gravelly slightly sandy CLAY.					
ENV2									
Bulk/									
			3						
			4						
			5						

TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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TRIAL PITTING LOG

TRIAL PIT NO. TP06

Page 1 of 1

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21	Date Drilling Completed: 15/2/21	Project Number: 413800
Contractor:	Excavation Method:	Surface Elev. (m) 8.74	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 167262.341000 E: 311419.897000		Personnel Logged By - Colin Morton Trial Pitter -		Excavation Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE	NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
	Bulk				MADE GROUND: brown clayey very gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick, claystone, concrete and mudstone, and boulders and cobbles of concrete and claystone.			
	ENV Bulk			1	Geotextile membrane. MADE GROUND: black clayey very gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and concrete.			Hydrocarbon odour
	ENV Bulk			2	MADE GROUND: reworked greenish brownish grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse mudstone. MADE GROUND: dark reddish brown slightly clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse claystone and mudstone. MADE GROUND: Greenish brownish grey clayey sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse mudstone and cobbles and boulders of mudstone.			
				3				
				4				
				5				

TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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TRIAL PITTING LOG

TRIAL PIT NO. TP07

Page 1 of 1

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21	Date Drilling Completed: 15/2/21	Project Number: 413800
Contractor:	Excavation Method:	Surface Elev. (m) 8.64	TOC Elevation (m) ---	Total Depth (m bgs) 4.0
Trial Pit Location: N: 167232.886000 E: 311377.100000		Personnel Logged By - Colin Morton Trial Pitter -		Excavation Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		Depth (m bgs) Depth (m bgs)

SAMPLE	NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	COMMENTS
					MADE GROUND: brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick, claystone, concrete and mudstone.			
	ENV1				Geotextile membrane.			
	Bulk				Grey Type 1 gravel.			
				1	Geotextile membrane.			
					MADE GROUND: dark brownish grey clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and flint.			
				2	MADE GROUND: greenish brownish grey clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse claystone.			
	ENV2							
				3				
				4				
				5				

TRIAL PITTING LOG (METRIC) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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BOREHOLE LOG

BH NO. CPBH01

Page 1 of 4

Facility/Project Name: The Mole, Barry		Date Drilling Started: 15/2/21	Date Drilling Completed: 16/2/21	Project Number: 413800
Drilling Firm:	Drilling Method:	Surface Elev. (m) 8.60	TOC Elevation (m) ---	Total Depth (m bgs) 25.0
Boring Location: N: 167368.20900 E: 311702.39600		Personnel Logged By - Colin Morton Driller -		Drilling Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		
		▽ Depth (m bgs) <u>6.5</u> ▽ Depth (m bgs) <u>2.6</u>		

SAMPLE NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
Bulk			1	MADE GROUND: brownish grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse concrete and mudstone.				
Bulk CPT		21		MADE GROUND: black clayey sandy GRAVEL with high cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse ash and clinker.				
Bulk			2					
CPT Bulk		8						
			3					
CPT Bulk		19						...Groundwater level after 30mins = 2.6m
			4					
CPT Bulk		17		MADE GROUND: very gravelly CLAY with high cobble content. Gravel is subangular to subrounded fine to coarse mudstone.				...Perched water encountered at 3.8m
			5					
CPT Bulk		4						

METRIC BOREHOLE LOG (NON-J.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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BOREHOLE LOG

BH NO. CPBH01

Page 2 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
CPT Bulk		7	7	MADE GROUND: greenish brownish grey slightly clayey sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse marl and mudstone. Cobbles of mudstone.				...Groundwater Encountered at 6.5m
CPT Bulk		9	8					
CPT Bulk		12	9					
Bulk			10					
Bulk SPT		13	11	Firm blueish grey sandy CLAY. (ALLUVIUM)				Piece of wood recovered at 10.0m. Not clear if this was pushed down from shallower made ground deposits and then recovered at 10.0m.
Bulk			12					
Bulk SPT		14	13	Soft greyish black silty sandy CLAY. Sand is fine to medium. (ALLUVIUM)				
Bulk								

METRIC BOREHOLE LOG (NON-U.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21



BOREHOLE LOG

BH NO. CPBH01

Page 3 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk SPT		8	14	Soft grey slightly sandy CLAY. Sand is fine to medium. (ALLUVIUM)				
			15					
SPT Bulk		7	16					
			17					
Bulk SPT		6	18					
			19	Stiff grey slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse Marl. (BLUE ANCHOR FORMATION)				
Bulk SPT		6	20					
			21					
Bulk SPT		7	22					
Bulk			23					
CPT		29	24					

METRIC BOREHOLE LOG (NON-U.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21



BOREHOLE LOG

BH NO. CPBH01

Page 4 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk			22	MUDSTONE. (BLUE ANCHOR FORMATION)				
			23					
CPT Bulk		>50	24					
			25					
			26					
			27					
			28					
			29					



BOREHOLE LOG

BH NO. CPBH02

Page 1 of 4

Facility/Project Name: The Mole, Barry		Date Drilling Started: 18/2/21	Date Drilling Completed: 22/2/21	Project Number: 413800	
Drilling Firm:	Drilling Method:	Surface Elev. (m) 7.86	TOC Elevation (m) ---	Total Depth (m bgs) 24.0	Borehole Dia. (cm)
Boring Location: N: 167377.64300 E: 311565.79200		Personnel Logged By - Colin Morton Driller -		Drilling Equipment:	
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		▽ Depth (m bgs) <u>10</u> ▼ Depth (m bgs) <u>3.5</u>	

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk			1	MADE GROUND: black slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick, concrete and mudstone.				
CPT Bulk		10	2	MADE GROUND: black very sandy GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick.				
CPT Bulk		6	3	MADE GROUND: dark grey clayey sandy GRAVEL with medium cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse brick and mudstone.				
CPT Bulk		11	4	MADE GROUND: dark grey very gravelly sandy CLAY with medium cobble content. Gravel is subangular to subrounded fine to coarse claystone and mudstone.				
CPT Bulk		10	5	MADE GROUND: dark greenish brownish grey slightly sandy clayey GRAVEL with high cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse mudstone.				
CPT Bulk		18						

...Groundwater level after 30mins = 3.5m

METRIC BOREHOLE LOG (NON-J.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
CPT Bulk		26	7	MADE GROUND: dark greenish grey gravelly slightly sandy CLAY. Gravel is subangular to subrounded fine to medium mudstone.				
Bulk			8	Soft dark greenish grey very sandy CLAY. Sand is fine to medium. (ALLUVIUM)				
Bulk SPT D		4	9					
SPT D		5	10					
Bulk SPT		6	11	Soft dark grey slightly sandy CLAY. (ALLUVIUM)				
Bulk SPT		11	12					
			13					

...Groundwater Encountered at 10m



BOREHOLE LOG

BH NO. CPBH02

Page 3 of 4

SAMPLE		RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE									
Bulk SPT			8	14					
				15					
Bulk SPT			7	16					
				17					
Bulk SPT			8	18					
Bulk				19					
Bulk SPT			9	20					
				21					
Bulk				22					
CPT			16	23					

Firm dark grey slightly peaty CLAY. (ALLUVIUM)

Medium dense dark reddish brown clayey slightly sandy GRAVEL with cobbles. Gravel is subangular to subrounded fine to medium marl. (WEATHERED BLUE ANCHOR FORMATION)



BOREHOLE LOG

BH NO. CPBH02

Page 4 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk			22					
			23					
			24					
			25					
			26					
			27					
			28					
			29					



BOREHOLE LOG

BH NO. CPBH03

Page 1 of 4

Facility/Project Name: The Mole, Barry		Date Drilling Started: 23/2/21	Date Drilling Completed: 24/2/21	Project Number: 413800
Drilling Firm:	Drilling Method:	Surface Elev. (m) 7.74	TOC Elevation (m) ---	Total Depth (m bgs) 25.0
Boring Location: N: 167349.17100 E: 311462.53600		Personnel Logged By - Martin Dorfling Driller -		Drilling Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		
		▽ Depth (m bgs) <u>4.3</u> ▼ Depth (m bgs) <u>4.5</u>		

SAMPLE	NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
	ENV Bulk			1	MADE GROUND: light brown clayey slightly sandy GRAVEL with medium cobble content. Sand is medium. Gravel is subangular medium.				
	CPT Bulk			2					
	CPT Bulk		33	3					
	CPT Bulk		20	4					
	ENV Bulk			4	MADE GROUND: light grey slightly sandy very clayey GRAVEL. Gravel is subangular medium to coarse.				...Groundwater Encountered at 4.3m ...Groundwater level after 30mins = 4.5m
	CPT Bulk		22	5					
	CPT Bulk		20						

METRIC BOREHOLE LOG (NON-J.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

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BOREHOLE LOG

BH NO. CPBH03

Page 2 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
CPT Bulk		8	7	Light grey very sandy CLAY. Sand is coarse. (ALLUVIUM)				
CPT Bulk		8	8					
Bulk			9					
CPT Bulk		4	10					
Bulk SPT D		6	11					
Bulk SPT D		4	13					



BOREHOLE LOG

BH NO. CPBH03

Page 3 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
Bulk SPT D		8	14					
			15					
Bulk SPT D		15	15	Firm dark grey slightly silty slightly sandy CLAY with possible peat. Sand is medium. (ALLUVIUM)				
Bulk			16	Very soft becoming firm light grey very sandy CLAY. Sand is medium. (ALLUVIUM)				
			17					
Bulk SPT D		4	17					
			18					
Bulk SPT D		6	19					
			20					
Bulk SPT D		11	20					
			21					
Bulk CPT		15	21	Firm light grey slightly silty gravelly CLAY. Gravel is subangular coarse. (ALLUVIUM)				

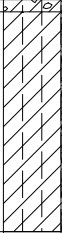

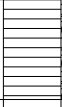

METRIC BOREHOLE LOG (NON-U.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21



BOREHOLE LOG

BH NO. CPBH03

Page 4 of 4

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
			22	Firm light greenish grey slightly silty CLAY. (ALLUVIUM)				
CPT Bulk		>50	23	MUDSTONE. ((BLUE ANCHOR FORMATION)				
			24					
			25					
			26					
			27					
			28					
			29					



BOREHOLE LOG

BH NO. CPBH04

Page 1 of 2

Facility/Project Name: The Mole, Barry		Date Drilling Started: 25/2/21	Date Drilling Completed: 26/2/21	Project Number: 413800
Drilling Firm:	Drilling Method:	Surface Elev. (m) 8.06	TOC Elevation (m) ---	Total Depth (m bgs) 25.0
Boring Location: N: 167297.40300 E: 311352.11000		Personnel Logged By - Martin Dorfling Driller -		Drilling Equipment:
Civil Town/City/or Village:	County:	Water Level Observations: While Drilling: Date/Time After Drilling: Date/Time		
		▽ Depth (m bgs) <u>4</u> ▽ Depth (m bgs) <u>3.3</u>		

SAMPLE	NUMBER AND TYPE	RECOVERY (%)	SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
ENV	Bulk			1	MADE GROUND: dark brownish black slightly clayey sandy GRAVEL. Sand is coarse. Gravel is angular to subangular medium.				
CPT	Bulk		15	2					
ENV	Bulk		13	3					
CPT	Bulk		15	4	MADE GROUND: light brown slightly clayey sandy GRAVEL with medium cobble content. Sand is coarse. Gravel is angular to subangular medium to coarse clastone and mudstone.				
CPT	Bulk		9	5					
CPT	Bulk		17						

METRIC BOREHOLE LOG (NON-J.S.) THE MOLE, BARRY LOGS.GPJ 413800 10/5/21

Signature:	Firm: TRC Companies Limited 20 Red Lion Street, London	Fax
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BOREHOLE LOG

BH NO. CPBH04

Page 2 of 2

SAMPLE		SPT N VALUE	DEPTH IN METERS	LITHOLOGIC DESCRIPTION	USCS	GRAPHIC LOG	WELL DIAGRAM	COMMENTS
NUMBER AND TYPE	RECOVERY (%)							
CPT Bulk		12	7					
CPT Bulk		21	8					
CPT Bulk		19	10					
Bulk				MADE GROUND: light brownish grey GRAVEL. Gravel is angular coarse mudstone.				
			11					
			12					
			13					

Annex D: Field Data

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: ABP
Site: Barry, Cardiff
Date: 03/19/21
Quote No:
Visit No: 1 of 4
Operator: Matt Credali
Project Manager: Jake Townsend

	GAS CONCENTRATIONS												VOLATILES		FLOW DATA			WELL AND WATER DATA		Comments		
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole	Time for flow to equalise	Water level (mbgl)		Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady	Pressure (Pa)	(secs)				
CPBH01	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NR	NR	NR	NR	NR	NR	Unable to open top hat, bolts too tight to move. Grease applied. (snapped 3 sets of allen keys, and no movement with hammer either.)
CPBH02	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NR	NR	NR	NR	NR	NR	
CPBH03	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NA	NR	NR	NR	NR	NR	NR	
CPBH04	ND	ND	ND	ND	0.4	0.1	ND	ND	ND	ND	20.4	20.6	ND	NA	0.2	0.2	0	60	3.05	9.75		
Max	ND	ND	ND	ND	0.4	0.1	ND	ND	ND	ND	20.4	20.6	NR	ND	0.2	0.2	0	60	3.05	9.75		
Min	ND	ND	ND	ND	0.4	0.1	ND	ND	ND	ND	20.4	20.6	NR	0.0	0.2	0.2	0.2	60	3.05	9.75		

ND - Not detected
NR - Not recorded
NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

State of ground:
Wind:
Cloud cover:
Precipitation:
Time monitoring performed:
Barometric pressure (mbar):
Pressure trend (Daily):
Source:
Air Temperature (Deg. C):

☒

Dry

☐

Calm

☐

None

☒

None

10:15

Start

1028

Start

x

Falling

Met Office

☐

Moist

x

Light

x

Slight

Slight

10:15

Start

1028

Start

x

Falling

9

Before

☐

Wet

Moderate

Cloudy

Moderate

14:00

End

1025

End

Rising

11

After

☐

Snow

Strong

Overcast

Heavy

☐

Frozen

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA2000plus; GA12652
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 01/06/21
Date of next calibration: 07/06/21

Ambient air check: CH₄ 0.0 CO₂ 0.0 O₂ 20.8

Page 1 of 4

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: ABP
Site: Barry, Cardiff
Date: 03/25/21

Quote No:
Visit No: 2 of 4
Operator: Matt Credali **Project Manager:** Jake Townsend

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
CPBH01	ND	ND	ND	ND	1.0	1.0	3	3	ND	ND	16.0	16.2	ND	NA	-9.6	-2.1	-0.56	60	4.20	10.10	
CPBH02	ND	ND	ND	ND	0.7	0.5	1	1	ND	ND	19.4	20.2	ND	NA	2.7	0.3	-0.68	60	3.55	10.12	
CPBH03	0.5	0.1	10.0	2.0	0.3	0.1	2	2	ND	ND	19.9	20.4	ND	NA	0.2	0.2	-0.64	60	3.37	10.33	
CPBH04	ND	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	20.4	20.6	ND	NA	0.3	0.2	0.58	60	3.61	9.75	
Max	0.5	0.1	10.0	2.0	1.0	1.0	3	3	ND	ND	20.4	20.6	NR	ND	2.7	0.3	1	60	4.20	10.33	
Min	ND	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	16.0	16.2	NR	0.0	-9.6	-2.1	-0.7	60	3.37	9.75	

ND - Not detected

NR - Not recorded

NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
Wind: ☐ Calm ☐ Light ☒ Moderate ☐ Strong
Cloud cover: ☐ None ☒ Slight ☐ Cloudy ☐ Overcast
Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
Time monitoring performed: ☐ 12:45 Start ☐ 14:15 End
Barometric pressure (mbar): ☐ 1024 Start ☐ 1027 End
Pressure trend (Daily): ☐ Falling ☐ Steady ☒ Rising
Source: Met Office
Air Temperature (Deg. C): ☐ 11 Before ☐ 12 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA2000plus; GA12652
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 01/06/21
Date of next calibration: 07/06/21

Ambient air check: CH₄ CO₂ O₂

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: ABP
Site: Barry (The mole)
Date: 03/30/21

Quote No:
Visit No: 3 of 4
Operator: Matt Credali **Project Manager:** Jake Townsend

	GAS CONCENTRATIONS												VOLATILES		FLOW DATA			WELL AND WATER DATA		Comments	
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)		Depth of well (m)
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
CPBH01	ND	ND	ND	ND	1.1	1.0	4	1	ND	ND	16.8	16.8	ND	NA	0.3	0.3	-0.47	60	2.45		10.07
CPBH02	0.1	ND	2.0	ND	1.5	1.3	1	ND	ND	ND	19.9	19.8	ND	NA	-11.4	-4.0	-2.25	60	1.76	10.10	
CPBH03	0.5	0.5	10.0	10.0	0.4	0.2	ND	ND	ND	ND	19.7	19.7	ND	NA	11.0	8.0	-0.46	60	1.61	10.32	
CPBH04	0.1	0.1	2.0	2.0	0.1	0.1	1	1	ND	ND	19.9	20.1	ND	NA	3.1	3.1	-0.71	60	1.84	9.85	
Max	0.5	0.5	10.0	10.0	1.5	1.3	4	1	ND	ND	19.9	20.1	NR	ND	11.0	8.0	0	60	2.45	10.32	
Min	ND	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	16.8	16.8	NR	0.0	-11.4	-4.0	-2.3	60	1.61	9.85	

ND - Not detected

NR - Not recorded

NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
Wind: ☐ Calm ☒ Light ☐ Moderate ☐ Strong
Cloud cover: ☒ None ☐ Slight ☐ Cloudy ☐ Overcast
Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
Time monitoring performed: ☐ 13:15 Start ☐ 14:30 End
Barometric pressure (mbar): ☐ 1027 Start ☐ 1027 End
Pressure trend (Daily): ☐ Falling ☒ Steady ☐ Rising
Source: Met Office
Air Temperature (Deg. C): ☐ 15 Before ☐ 15 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA2000plus; GA12652
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 01/06/21
Date of next calibration: 07/06/21

Ambient air check: CH₄ CO₂ O₂

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client: ABP
Site: Barry (The mole)
Date: 04/21/21

Quote No:
Visit No: 4 of 4
Operator: Matt Credali **Project Manager:** Jake Townsend

Monitoring Point	GAS CONCENTRATIONS												VOLATILES		FLOW DATA				WELL AND WATER DATA		Comments
	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (ppmv)		Hydrogen sulphide (ppmv)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Min.	Steady			Peak	Steady					
CPBH01	0.1	0.1	1.0	1.0	0.9	0.8	1	1	ND	ND	19.1	19.1	ND	NA	0.5	0.3	-0.86	60	4.20	10.05	Sampled successfully.
CPBH02	0.1	0.1	1.0	1.0	0.8	0.8	ND	ND	ND	ND	19.0	19.3	ND	NA	-8.1	-5.3	-3.14	60	3.52	10.10	Sampled successfully.
CPBH03	ND	ND	ND	ND	0.9	0.2	ND	ND	ND	ND	18.0	18.2	ND	NA	6.2	2.1	-0.21	60	3.37	10.30	Sampled successfully.
CPBH04	ND	ND	ND	ND	0.1	0.1	1	1	ND	ND	20.5	20.5	ND	NA	3.3	2.9	-1.24	60	3.61	9.85	Sampled successfully.
Max	0.1	0.1	1.0	1.0	0.9	0.8	1	1	ND	ND	20.5	20.5	NR	ND	6.2	2.9	0	60	4.20	10.30	
Min	ND	ND	ND	ND	0.1	0.1	ND	ND	ND	ND	18.0	18.2	NR	0.0	-8.1	-5.3	-3.1	60	3.37	9.85	

ND - Not detected

NR - Not recorded

NA - Non applicable

METEOROLOGICAL AND SITE INFORMATION:

(Select correct box with X or enter data, as applicable)

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
Wind: ☐ Calm ☐ Light ☒ Moderate ☐ Strong
Cloud cover: ☒ None ☐ Slight ☐ Cloudy ☐ Overcast
Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
Time monitoring performed: ☐ 14:15 Start ☐ 15:15 End
Barometric pressure (mbar): ☐ 1026 Start ☐ 1025 End
Pressure trend (Daily): ☐ 5 Falling ☐ Steady ☐ Rising
Source: Met Office
Air Temperature (Deg. C): ☐ 14 Before ☐ 13 After

INSTRUMENTATION TECHNICAL SPECIFICATIONS:

Ground gas meter: GA2000plus; GA12652
Gas Range: CH₄ 0 - 100% CO₂ 0 - 100% O₂ 0 - 25%
Gas Flow range: +100/-50 l/hour
Differential Pressure: (+/-) 1000 Pa
Date of last calibration: 01/06/21
Date of next calibration: 07/06/21

Ambient air check: CH₄ CO₂ O₂

Annex E: Laboratory Chemical Data



Jonathon Sander

TRC Companies Ltd
Work.Life
Brown Street
Manchester
M2 1DH

e: JSander@trccompanies.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 21-70557

Project / Site name: ABP The Mole 413800

Samples received on: 23/04/2021

Your job number:

**Samples instructed on/
Analysis started on:** 24/04/2021

Your order number:

Analysis completed by: 29/04/2021

Report Issue Number: 1

Report issued on: 29/04/2021

Samples Analysed: 3 water samples

Signed:



Rachel Bradley
Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-70557
Project / Site name: ABP The Mole 413800

Lab Sample Number				1847339	1847340	1847341
Sample Reference				CPBH01	CPBH02	CPBH04
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH	pH Units	N/A	ISO 17025	7.1	7.6	7.9
Sulphate as SO ₄	µg/l	45	ISO 17025	739000	311000	353000
Sulphate as SO ₄	mg/l	0.045	ISO 17025	739	311	353

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.16	ISO 17025	< 0.16	< 0.16	< 0.16
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Heavy Metals / Metalloids

Boron (dissolved)	µg/l	10	ISO 17025	940	370	470
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	3.9	4.3	3.0

Arsenic (dissolved)	µg/l	0.15	ISO 17025	33.0	15.4	21.7
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.11
Chromium (dissolved)	µg/l	0.2	ISO 17025	3.9	4.3	3.0
Copper (dissolved)	µg/l	0.5	ISO 17025	21	15	23
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	6.1	3.2	4.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	21	12	15
Zinc (dissolved)	µg/l	0.5	ISO 17025	0.7	0.8	0.7



Analytical Report Number: 21-70557
Project / Site name: ABP The Mole 413800

Lab Sample Number				1847339	1847340	1847341
Sample Reference				CPBH01	CPBH02	CPBH04
Sample Number				None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

Monoaromatics & Oxygenates

Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-70557
Project / Site name: ABP The Mole 413800

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 *for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
pH at 20oC in water (automated)	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In house method.	L099-PL	W	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 21-70557
Project / Site name: ABP The Mole 413800

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CPBH01	None Supplied	W	1847339	ab	BTEX and MTBE in water (Monoaromatics)	L073B-PL	b
CPBH02	None Supplied	W	1847340	ab	BTEX and MTBE in water (Monoaromatics)	L073B-PL	b
CPBH04	None Supplied	W	1847341	ab	BTEX and MTBE in water (Monoaromatics)	L073B-PL	b



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Analytical Report Number : 21-59257

Replaces Analytical Report Number: 21-59257, issue no. 1
Additional analysis undertaken.

Project / Site name:	413 800	Samples received on:	26/02/2021
Your job number:	413 800	Samples instructed on/ Analysis started on:	26/02/2021
Your order number:		Analysis completed by:	11/03/2021
Report Issue Number:	2	Report issued on:	12/03/2021
Samples Analysed:	4 soil samples		

Signed:

Agnieszka Czerwińska
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-59257

Project / Site name: 413 800

Lab Sample Number				1784880	1784881	1784882	1784883
Sample Reference				CPBH03	CPBH03	CPBH04	CPBH04
Sample Number				ENV1	ENV2	ENV1	ENV2
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				23/02/2021	23/02/2021	25/02/2021	25/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	7.7	13	11	11
Total mass of sample received	kg	0.001	NONE	1.3	1.2	1.0	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.5	10.5	8.6	9.1
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.37	0.25	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.49	0.54	< 0.05	0.63
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.70	0.64	< 0.05	0.46
Pyrene	mg/kg	0.05	MCERTS	0.75	0.75	< 0.05	0.56
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.48	0.50	< 0.05	0.27
Chrysene	mg/kg	0.05	MCERTS	0.47	0.41	< 0.05	0.32
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.75	0.83	< 0.05	0.43
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.26	0.28	< 0.05	0.15
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.70	0.66	< 0.05	0.24
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.35	0.42	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.49	0.53	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	5.81	5.81	< 0.80	3.06
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.9	10	12	6.2
Boron (water soluble)	mg/kg	0.2	MCERTS	2.6	2.0	0.6	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	14	16	17	12
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	16	17	12
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	28	42	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	300	160	64	37
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	23	20	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	76	90	91	62

Analytical Report Number: 21-59257

Project / Site name: 413 800

Lab Sample Number				1784880	1784881	1784882	1784883
Sample Reference				CPBH03	CPBH03	CPBH04	CPBH04
Sample Number				ENV1	ENV2	ENV1	ENV2
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				23/02/2021	23/02/2021	25/02/2021	25/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

Analytical Report Number: 21-59257
Project / Site name: 413 800

Lab Sample Number				1784880	1784881	1784882	1784883
Sample Reference				CPBH03	CPBH03	CPBH04	CPBH04
Sample Number				ENV1	ENV2	ENV1	ENV2
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				23/02/2021	23/02/2021	25/02/2021	25/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.6	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	11	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	16	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	84	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	110	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-59257

Project / Site name: 413 800

Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1784882	CPBH04		115	Loose Fibres	Amosite	< 0.001	< 0.001
1784883	CPBH04		132	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 21-59257

Project / Site name: 413 800

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1784880	CPBH03	ENV1	None Supplied	Brown loam and clay with gravel and vegetation.
1784881	CPBH03	ENV2	None Supplied	Brown clay and loam with gravel and vegetation.
1784882	CPBH04	ENV1	None Supplied	Brown clay and loam with gravel and vegetation.
1784883	CPBH04	ENV2	None Supplied	Brown clay and sand with gravel.

Analytical Report Number : 21-59257

Project / Site name: 413 800

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.



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Analytical Report Number : 21-58009

Project / Site name:	41380	Samples received on:	22/02/2021
Your job number:	41380	Samples instructed on/ Analysis started on:	22/02/2021
Your order number:		Analysis completed by:	26/02/2021
Report Issue Number:	1	Report issued on:	26/02/2021
Samples Analysed:	2 soil samples		

Signed:



Will Fardon
Technical Reviewer (CS Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-58009

Project / Site name: 41380

Lab Sample Number				1777099	1777100
Sample Reference				CPBH02	CPBH02
Sample Number				ENV1	ENV2
Depth (m)				1.50	4.40
Date Sampled				Deviating	Deviating
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	12	25
Total mass of sample received	kg	0.001	NONE	1.2	1.2

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.2
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.38	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.4	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.38	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	1.16	< 0.80
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.7	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	6.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	10	24
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	10	25
Copper (aqua regia extractable)	mg/kg	1	MCERTS	47	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	78	35
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	10	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	110

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

Analytical Report Number: 21-58009

Project / Site name: 41380

Lab Sample Number				1777099	1777100
Sample Reference				CPBH02	CPBH02
Sample Number				ENV1	ENV2
Depth (m)				1.50	4.40
Date Sampled				Deviating	Deviating
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-58009

Project / Site name: 41380

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1777099	CPBH02	ENV1	1.5	Brown clay and sand with gravel and vegetation.
1777100	CPBH02	ENV2	4.4	Brown clay and sand with vegetation and gravel

Analytical Report Number : 21-58009

Project / Site name: 41380

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample Deviation Report



Analytical Report Number : 21-58009

Project / Site name: 41380

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CPBH02	ENV1	S	1777099	a	None Supplied	None Supplied	None Supplied
CPBH02	ENV2	S	1777100	a	None Supplied	None Supplied	None Supplied



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Analytical Report Number : 21-57125

Replaces Analytical Report Number: 21-57125, issue no. 1
Additional analysis undertaken.

Project / Site name:	413800	Samples received on:	17/02/2021
Your job number:	413800	Samples instructed on/ Analysis started on:	17/02/2021
Your order number:		Analysis completed by:	12/03/2021
Report Issue Number:	2	Report issued on:	12/03/2021
Samples Analysed:	13 soil samples		

Signed:



Joanna Wawrzeczko
Technical Reviewer (Reporting Team)
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-57125

Project / Site name: 413800

Lab Sample Number				1771951	1771952	1771953	1771954	1771955
Sample Reference				CPBH01	CPBH01	TP01	TP01	TP02
Sample Number				ENV1	ENV2	ENV1	ENV2	ENV1
Depth (m)				1.60	3.80	0.10	2.80	0.80
Date Sampled				15/02/2021	15/02/2021	15/02/2021	15/02/2021	15/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	16	13	12	13
Total mass of sample received	kg	0.001	NONE	0.90	1.0	1.2	1.2	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Amosite	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	Detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	< 0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	< 0.001	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	8.7	7.7	9.0	8.2
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.6	< 0.05	0.96	< 0.05	1.2
Acenaphthylene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	< 0.05	0.17
Acenaphthene	mg/kg	0.05	MCERTS	0.21	< 0.05	0.25	< 0.05	0.52
Fluorene	mg/kg	0.05	MCERTS	0.47	< 0.05	0.28	< 0.05	0.53
Phenanthrene	mg/kg	0.05	MCERTS	4.0	0.31	2.0	< 0.05	3.9
Anthracene	mg/kg	0.05	MCERTS	0.52	< 0.05	0.29	< 0.05	0.58
Fluoranthene	mg/kg	0.05	MCERTS	4.0	0.30	2.3	< 0.05	4.4
Pyrene	mg/kg	0.05	MCERTS	3.4	0.28	2.1	< 0.05	4.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.1	0.23	1.5	< 0.05	3.0
Chrysene	mg/kg	0.05	MCERTS	2.5	0.17	1.7	< 0.05	2.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.6	< 0.05	2.0	< 0.05	3.3
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.78	< 0.05	1.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.0	< 0.05	1.7	< 0.05	2.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	< 0.05	0.93	< 0.05	1.4
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	< 0.05	1.6	< 0.05	1.6

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	27.2	1.29	18.5	< 0.80	30.5
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	8.6	18	8.8	21
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	4.5	0.9	2.8	1.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	6.1	31	23	21	21
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	6.3	32	24	21	21
Copper (aqua regia extractable)	mg/kg	1	MCERTS	190	40	200	24	140
Lead (aqua regia extractable)	mg/kg	1	MCERTS	200	46	440	28	380
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.6	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	33	34	22	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	69	530	88	210

Analytical Report Number: 21-57125

Project / Site name: 413800

Lab Sample Number				1771951	1771952	1771953	1771954	1771955
Sample Reference				CPBH01	CPBH01	TP01	TP01	TP02
Sample Number				ENV1	ENV2	ENV1	ENV2	ENV1
Depth (m)				1.60	3.80	0.10	2.80	0.80
Date Sampled				15/02/2021	15/02/2021	15/02/2021	15/02/2021	15/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	42	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	35	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	14	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	3.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	2.3	< 2.0	3.1	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	14	< 8.0	22	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	110	< 8.0	45	< 8.0	37
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	130	< 10	70	< 10	40

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	0.042	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	0.035	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	0.017	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.2	< 1.0	7.9	4.3	8.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.7	< 2.0	15	3.4	7.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	13	< 10	38	< 10	15
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	15	< 10	92	< 10	18
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	34	< 10	150	12	48

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-57125

Project / Site name: 413800

Lab Sample Number				1771956	1771957	1771958	1771959	1771960
Sample Reference				TP04	TP04	TP05	TP05	TP06
Sample Number				ENV1	ENV2	ENV1	ENV2	ENV1
Depth (m)				1.40	2.80	1.10	2.40	1.00
Date Sampled				15/02/2021	15/02/2021	15/02/2021	15/02/2021	15/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	18	7.1	22	14
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.5	1.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	-	Not-detected	-	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.0	8.1	8.3	8.0	8.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.6	0.73	0.49	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05	< 0.05	0.16
Acenaphthene	mg/kg	0.05	MCERTS	0.20	0.30	< 0.05	0.29	0.46
Fluorene	mg/kg	0.05	MCERTS	0.47	0.54	< 0.05	0.18	0.35
Phenanthrene	mg/kg	0.05	MCERTS	2.6	1.2	1.6	1.4	2.5
Anthracene	mg/kg	0.05	MCERTS	0.43	< 0.05	0.49	0.23	0.63
Fluoranthene	mg/kg	0.05	MCERTS	2.1	0.63	2.0	1.8	4.8
Pyrene	mg/kg	0.05	MCERTS	1.8	0.65	1.4	1.7	3.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.0	0.51	0.95	0.86	3.4
Chrysene	mg/kg	0.05	MCERTS	1.8	0.47	0.76	0.64	4.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.7	0.56	0.85	0.73	5.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.2	0.21	0.43	0.36	2.6
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.5	0.39	0.52	0.74	4.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.5	0.29	0.50	0.32	2.9
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.99
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.7	0.36	0.52	0.40	3.1

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	21.7	6.82	10.6	9.54	40.6
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	13	14	12	7.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	1.1	1.0	1.4	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	24	18	14	18	19
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	18	14	18	19
Copper (aqua regia extractable)	mg/kg	1	MCERTS	260	61	130	17	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	200	64	110	38	67
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.5	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	20	17	16	41
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	240	87	120	76	500

Analytical Report Number: 21-57125

Project / Site name: 413800

Lab Sample Number				1771956	1771957	1771958	1771959	1771960
Sample Reference				TP04	TP04	TP05	TP05	TP06
Sample Number				ENV1	ENV2	ENV1	ENV2	ENV1
Depth (m)				1.40	2.80	1.10	2.40	1.00
Date Sampled				15/02/2021	15/02/2021	15/02/2021	15/02/2021	15/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	0.080	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	13	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	16	130	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	66	170	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	130	87	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	210	410	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	5.9	13	4.4	< 1.0	7.1
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	49	7.5	< 2.0	16
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	32	67	16	< 10	27
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	62	44	11	< 10	51
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	110	170	38	< 10	100

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-57125

Project / Site name: 413800

Lab Sample Number				1771961	1771962	1771963
Sample Reference				TP06	TP07	TP07
Sample Number				ENV2	ENV1	ENV2
Depth (m)				2.60	0.50	2.50
Date Sampled				15/02/2021	15/02/2021	15/02/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	16	13	16
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	-	Not-detected	-
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	8.3	8.5
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.96	0.74	1.1
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.15	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.14	0.61
Fluorene	mg/kg	0.05	MCERTS	0.19	0.19	0.42
Phenanthrene	mg/kg	0.05	MCERTS	1.6	1.3	3.4
Anthracene	mg/kg	0.05	MCERTS	0.27	0.32	0.85
Fluoranthene	mg/kg	0.05	MCERTS	1.7	1.7	4.0
Pyrene	mg/kg	0.05	MCERTS	1.9	1.5	3.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.3	1.1	2.6
Chrysene	mg/kg	0.05	MCERTS	1.1	1.4	2.9
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.7	1.5	2.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.51	0.59	1.4
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.4	1.1	2.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.73	1.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	0.83	1.4

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	15.0	13.2	28.3
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	14	18
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	0.7	2.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	19	25	20
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	26	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	78	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	320	250	140
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	1.1	1.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	32	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	290	200	190

Analytical Report Number: 21-57125

Project / Site name: 413800

Lab Sample Number				1771961	1771962	1771963
Sample Reference				TP06	TP07	TP07
Sample Number				ENV2	ENV1	ENV2
Depth (m)				2.60	0.50	2.50
Date Sampled				15/02/2021	15/02/2021	15/02/2021
Time Taken				None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status			
Monoaromatics & Oxygenates						
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	5.0	2.5
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	8.4	9.3
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	25
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	17	44

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	3.4	7.1
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	5.7	16
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	10	< 10	28
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	21	19	38
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	32	38	89

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 21-57125

Project / Site name: 413800

Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006-PL based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1771953	TP01	0.10	139	Loose Fibres	Amosite	< 0.001	< 0.001
1771956	TP04	1.40	131	Loose Fibres	Chrysotile	< 0.001	< 0.001

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 21-57125

Project / Site name: 413800

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1771951	CPBH01	ENV1	1.6	Black clay and sand.
1771952	CPBH01	ENV2	3.8	Brown clay and loam.
1771953	TP01	ENV1	0.1	Brown loam and clay with gravel and vegetation.
1771954	TP01	ENV2	2.8	Brown clay and loam with gravel and vegetation.
1771955	TP02	ENV1	0.8	Brown loam and clay with gravel and vegetation.
1771956	TP04	ENV1	1.4	Brown loam and clay with gravel and vegetation.
1771957	TP04	ENV2	2.8	Brown clay and loam with gravel and vegetation.
1771958	TP05	ENV1	1.1	Brown loam and clay with gravel and vegetation.
1771959	TP05	ENV2	2.4	Grey clay and sand.
1771960	TP06	ENV1	1	Brown clay and loam with gravel.
1771961	TP06	ENV2	2.6	Brown clay and loam with gravel.
1771962	TP07	ENV1	0.5	Brown loam and clay with gravel and vegetation.
1771963	TP07	ENV2	2.5	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 21-57125

Project / Site name: 413800

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Annex F: Screened Data

Annex G: Laboratory Geotechnical Data



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Analytical Report Number : 21-65463

Project / Site name:	The Mole, Barry	Samples received on:	01/03/2021
Your job number:	413800	Samples instructed on/ Analysis started on:	23/03/2021
Your order number:		Analysis completed by:	13/04/2021
Report Issue Number:	1	Report issued on:	13/04/2021
Samples Analysed:	22 soil samples		

Signed:

Karolina Marek
PL Head of Reporting Team
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement.
Application of uncertainty of measurement would provide a range within which the true result lies.
An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 21-65463
Project / Site name: The Mole, Barry

Lab Sample Number				1819139	1819140	1819141	1819142	1819143
Sample Reference				TP02	TP04	TP05	CPBH01	CPBH01
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.90	0.40	2.50	5.00	12.50
Date Sampled				15/02/2021	15/02/2021	15/02/2021	15/02/2021	16/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	5.2	13	25	30	22
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.40	0.40	0.70

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.4	8.4	8.0	8.4	8.6
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.078	0.083	1.0	1.6	1.0
Organic Matter	%	0.1	MCERTS	-	-	-	-	2.0

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-65463
Project / Site name: The Mole, Barry

Lab Sample Number				1819144	1819145	1819146	1819147	1819148
Sample Reference				CPBH01	CPBH01	CPBH01	CPBH01	CPBH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				13.00	15.50	18.50	21.50	3.00
Date Sampled				16/02/2021	16/02/2021	16/02/2021	17/02/2021	18/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	23	23	20	17	19
Total mass of sample received	kg	0.001	NONE	0.40	0.70	0.40	0.40	0.40

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	-	-	8.8	9.0
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	0.13	0.25
Organic Matter	%	0.1	MCERTS	1.0	1.7	2.6	-	3.9

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-65463
Project / Site name: The Mole, Barry

Lab Sample Number				1819149	1819150	1819151	1819152	1819153
Sample Reference				CPBH02	CPBH02	CPBH02	CPBH02	CPBH02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				4.00	7.00	8.00	11.00	18.50
Date Sampled				18/02/2021	18/02/2021	18/02/2021	19/02/2021	19/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	26	30	20	15	24
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.40	0.70	0.70

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	-	8.4	-	8.7	8.3
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.76	-	0.44	0.53
Organic Matter	%	0.1	MCERTS	5.4	4.0	1.8	0.7	4.6

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-65463
Project / Site name: The Mole, Barry

Lab Sample Number				1819154	1819155	1819156	1819157	1819158
Sample Reference				CPBH03	CPBH03	CPBH03	CPBH03	CPBH03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				3.00	11.00	14.00	18.50	23.00
Date Sampled				23/02/2021	24/02/2021	24/02/2021	24/02/2021	24/02/2021
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	8.3	20	22	23	1.9
Total mass of sample received	kg	0.001	NONE	0.40	0.40	0.40	0.40	0.40

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.9	8.6	8.7	7.9	8.6
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.10	0.49	0.42	0.31	0.24
Organic Matter	%	0.1	MCERTS	-	1.4	1.9	0.9	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 21-65463
Project / Site name: The Mole, Barry

Lab Sample Number				1819159	1819160
Sample Reference				CPBH04	CPBH04
Sample Number				None Supplied	None Supplied
Depth (m)				2.00	6.50
Date Sampled				25/02/2021	25/02/2021
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	9.6	19
Total mass of sample received	kg	0.001	NONE	0.40	0.40

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	8.6
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.035	0.19
Organic Matter	%	0.1	MCERTS	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 21-65463

Project / Site name: The Mole, Barry

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1819139	TP02	None Supplied	0.9	Brown clay and loam with gravel.
1819140	TP04	None Supplied	0.4	Brown clay and loam with gravel and vegetation.
1819141	TP05	None Supplied	2.5	Brown clay.
1819142	CPBH01	None Supplied	5	Grey clay with gravel.
1819143	CPBH01	None Supplied	12.5	Brown clay and loam.
1819144	CPBH01	None Supplied	13	Brown clay and loam.
1819145	CPBH01	None Supplied	15.5	Brown loam and clay.
1819146	CPBH01	None Supplied	18.5	Brown loam and clay.
1819147	CPBH01	None Supplied	21.5	Brown sandy clay with gravel.
1819148	CPBH02	None Supplied	3	Brown clay.
1819149	CPBH02	None Supplied	4	Brown clay and loam.
1819150	CPBH02	None Supplied	7	Grey clay.
1819151	CPBH02	None Supplied	8	Brown clay and loam with gravel.
1819152	CPBH02	None Supplied	11	Brown sandy loam.
1819153	CPBH02	None Supplied	18.5	Grey clay and loam.
1819154	CPBH03	None Supplied	3	Brown clay and gravel.
1819155	CPBH03	None Supplied	11	Light grey clay.
1819156	CPBH03	None Supplied	14	Grey clay and sand.
1819157	CPBH03	None Supplied	18.5	Grey loam.
1819158	CPBH03	None Supplied	23	Non Soil**
1819159	CPBH04	None Supplied	2	Brown clay and gravel.
1819160	CPBH04	None Supplied	6.5	Brown clay.

** Non MCERTS matrix

Analytical Report Number : 21-65463
Project / Site name: The Mole, Barry

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report



Analytical Report Number : 21-65463

Project / Site name: The Mole, Barry

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
CPBH01	None Supplied	S	1819142	c	pH in soil (automated)	L099-PL	c
CPBH01	None Supplied	S	1819143	c	Organic matter (Automated) in soil	L009-PL	c
CPBH01	None Supplied	S	1819143	c	pH in soil (automated)	L099-PL	c
CPBH01	None Supplied	S	1819144	c	Organic matter (Automated) in soil	L009-PL	c
CPBH01	None Supplied	S	1819145	c	Organic matter (Automated) in soil	L009-PL	c
CPBH01	None Supplied	S	1819146	c	Organic matter (Automated) in soil	L009-PL	c
CPBH01	None Supplied	S	1819147	c	pH in soil (automated)	L099-PL	c
CPBH02	None Supplied	S	1819148	c	Organic matter (Automated) in soil	L009-PL	c
CPBH02	None Supplied	S	1819148	c	pH in soil (automated)	L099-PL	c
CPBH02	None Supplied	S	1819149	c	Organic matter (Automated) in soil	L009-PL	c
CPBH02	None Supplied	S	1819150	c	Organic matter (Automated) in soil	L009-PL	c
CPBH02	None Supplied	S	1819150	c	pH in soil (automated)	L099-PL	c
CPBH02	None Supplied	S	1819151	c	Organic matter (Automated) in soil	L009-PL	c
CPBH02	None Supplied	S	1819152	c	Organic matter (Automated) in soil	L009-PL	c
CPBH02	None Supplied	S	1819152	c	pH in soil (automated)	L099-PL	c
CPBH02	None Supplied	S	1819153	c	Organic matter (Automated) in soil	L009-PL	c
CPBH02	None Supplied	S	1819153	c	pH in soil (automated)	L099-PL	c
CPBH03	None Supplied	S	1819154	c	pH in soil (automated)	L099-PL	c
CPBH03	None Supplied	S	1819155	c	Organic matter (Automated) in soil	L009-PL	c
CPBH03	None Supplied	S	1819155	c	pH in soil (automated)	L099-PL	c
CPBH03	None Supplied	S	1819156	c	Organic matter (Automated) in soil	L009-PL	c
CPBH03	None Supplied	S	1819156	c	pH in soil (automated)	L099-PL	c
CPBH03	None Supplied	S	1819157	c	Organic matter (Automated) in soil	L009-PL	c
CPBH03	None Supplied	S	1819157	c	pH in soil (automated)	L099-PL	c
CPBH03	None Supplied	S	1819158	c	pH in soil (automated)	L099-PL	c
CPBH04	None Supplied	S	1819159	c	pH in soil (automated)	L099-PL	c
CPBH04	None Supplied	S	1819160	c	pH in soil (automated)	L099-PL	c
TP02	None Supplied	S	1819139	c	pH in soil (automated)	L099-PL	c
TP04	None Supplied	S	1819140	c	pH in soil (automated)	L099-PL	c
TP05	None Supplied	S	1819141	c	pH in soil (automated)	L099-PL	c



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 15/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819067

Hole No.: TP05

Sample Reference: Not Given

Soil Description: Brown slightly gravelly slightly sandy CLAY

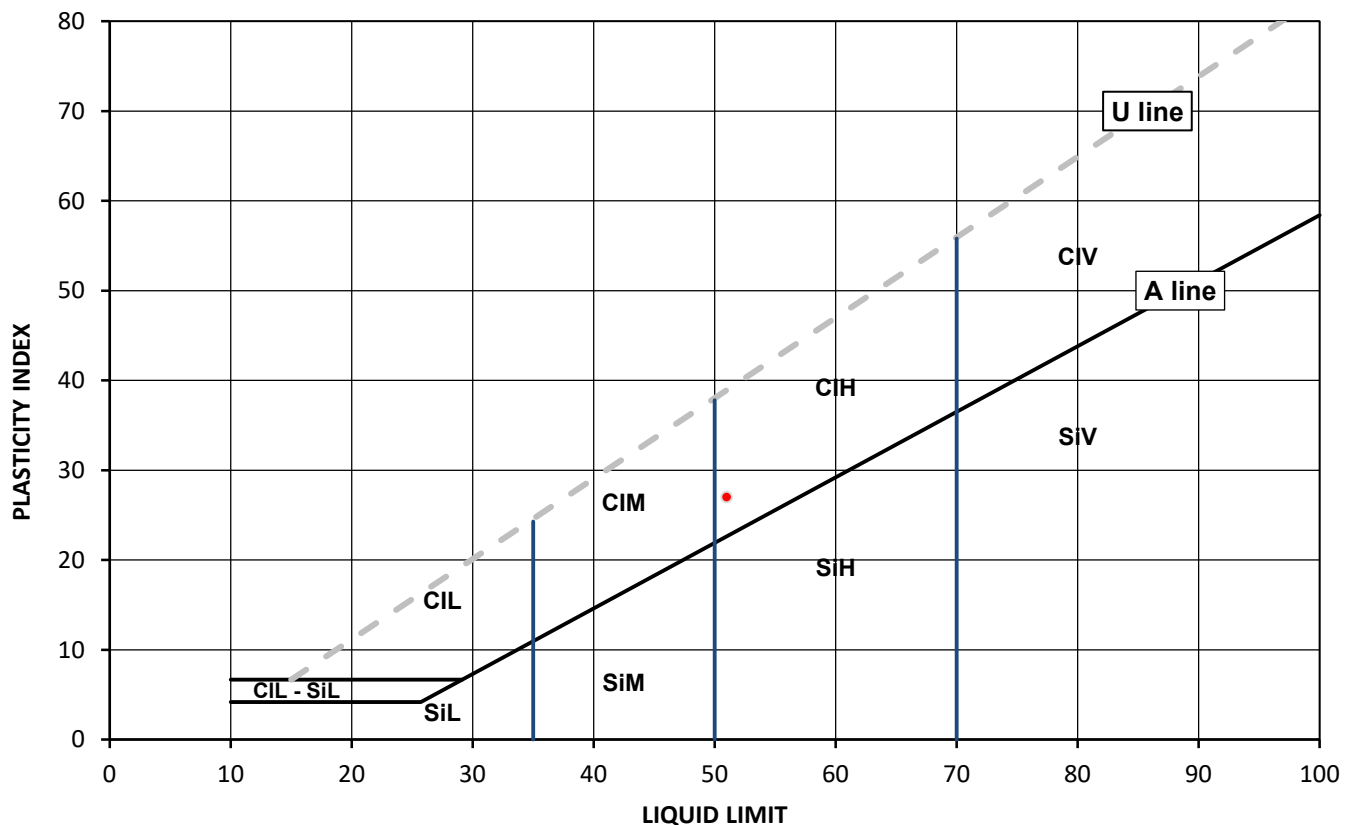
Depth Top [m]: 2.50

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
35	51	24	27	92



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
		H High 50 to 70
		V Very high exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

Opinions and interpretations expressed herein are outside of the scope of the UKAS Accreditation. This report may not be reproduced other than in full without the prior written approval of the issuing laboratory. The results included within the report relate only to the sample(s) submitted for testing.

Page 1 of 1

Date Reported: 20/04/2021

GF 236.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
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Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 16/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819072

Hole No.: CPBH01

Sample Reference: Not Given

Soil Description: Grey sandy CLAY

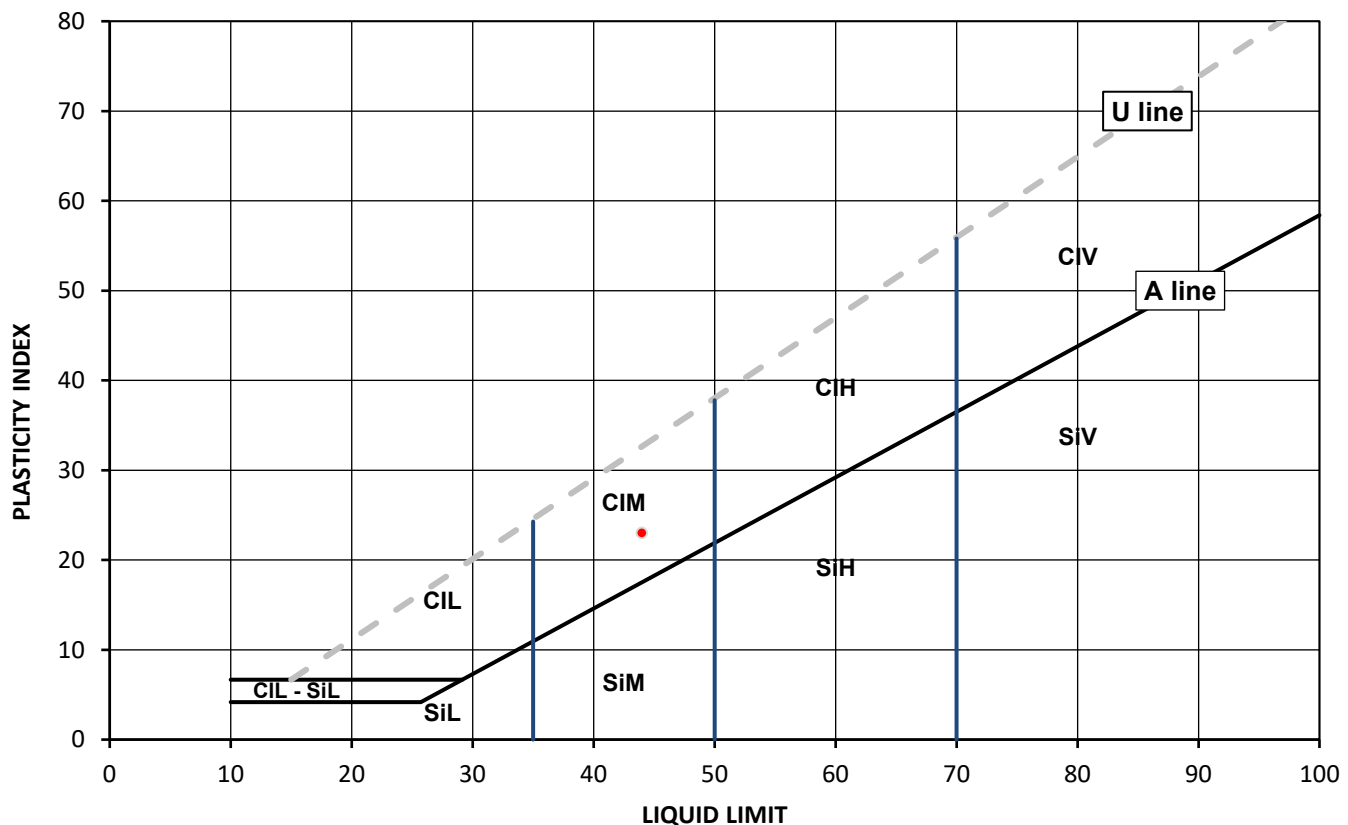
Depth Top [m]: 12.50

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
37	44	21	23	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
		H High 50 to 70
		V Very high exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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Page 1 of 1

Date Reported: 20/04/2021

GF 236.10



TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 413800
Job Number: 21-65451
Date Sampled: 16/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

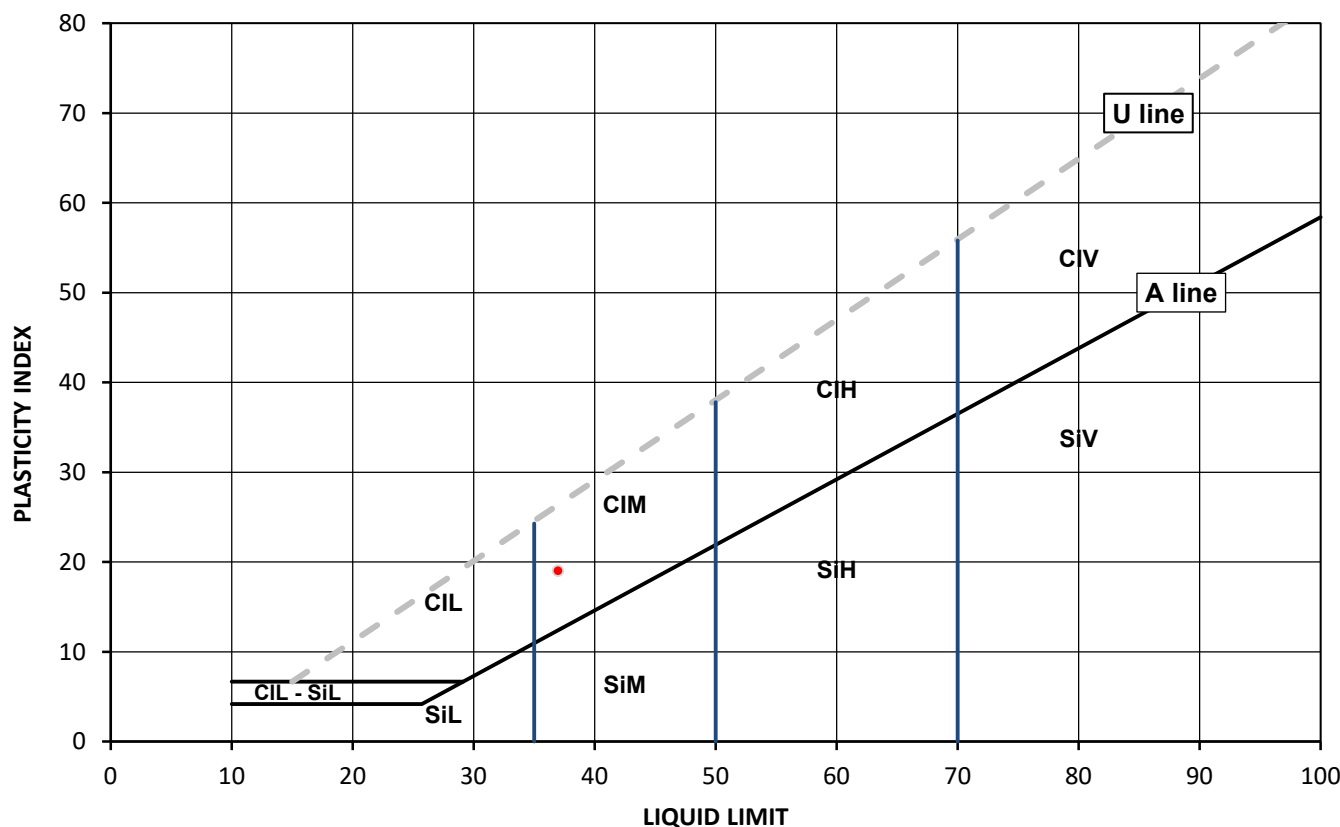
Test Results:

Laboratory Reference: 1819073
Hole No.: CPBH01
Sample Reference: Not Given
Soil Description: Brownish grey sandy CLAY

Depth Top [m]: 13.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
34	37	18	19	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
	H High 50 to 70	V Very high exceeding 70
	O Organic	O append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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PL Deputy Head of Geotechnical Section
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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 413800
Job Number: 21-65451
Date Sampled: 16/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

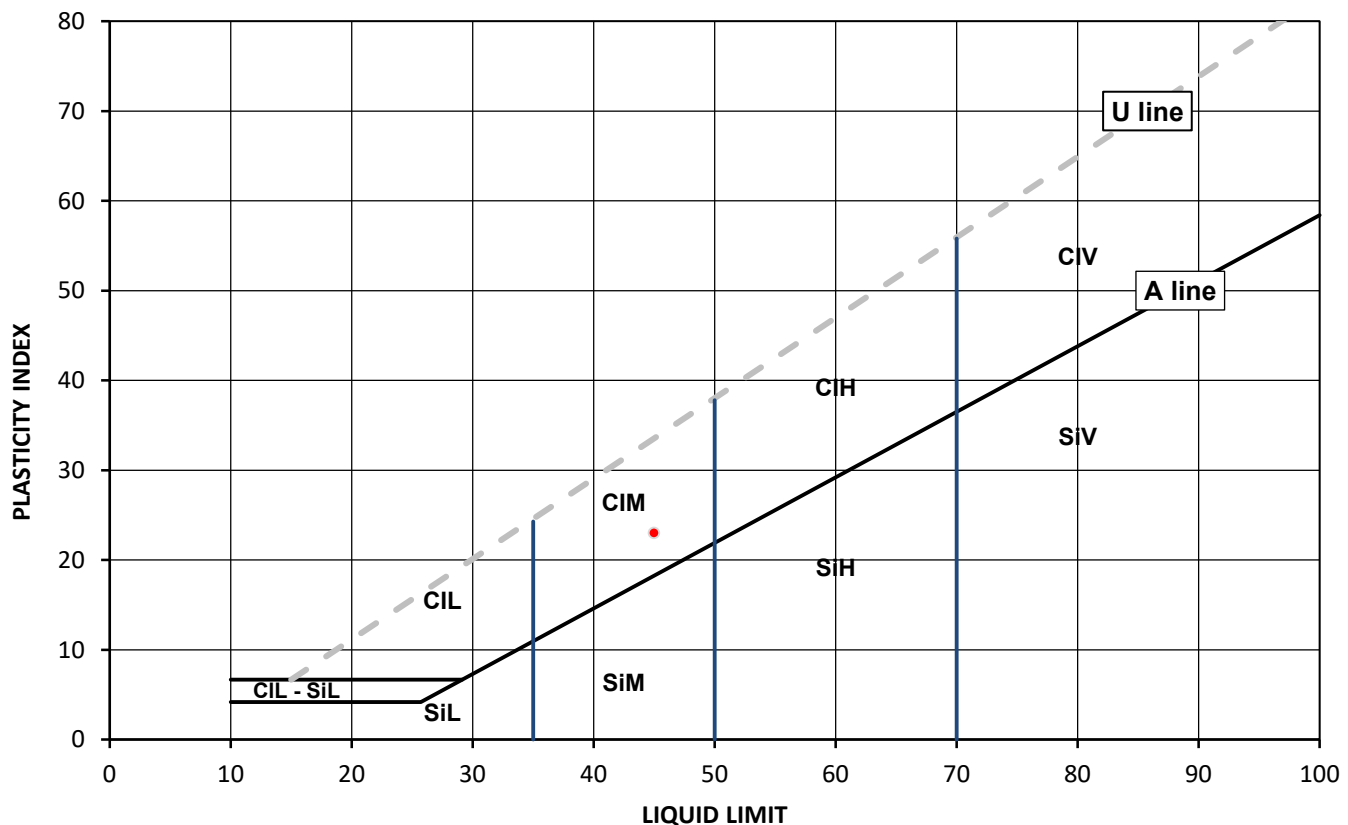
Test Results:

Laboratory Reference: 1819074
Hole No.: CPBH01
Sample Reference: Not Given
Soil Description: Grey slightly sandy CLAY

Depth Top [m]: 15.50
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
40	45	22	23	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	below 35
Si	Silt	35 to 50
	L	Low
	M	Medium
	H	High
	V	Very high
	O	Organic
		append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 413800
Job Number: 21-65451
Date Sampled: 16/02/2021
Date Received: 01/03/2021
Date Tested: 08/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

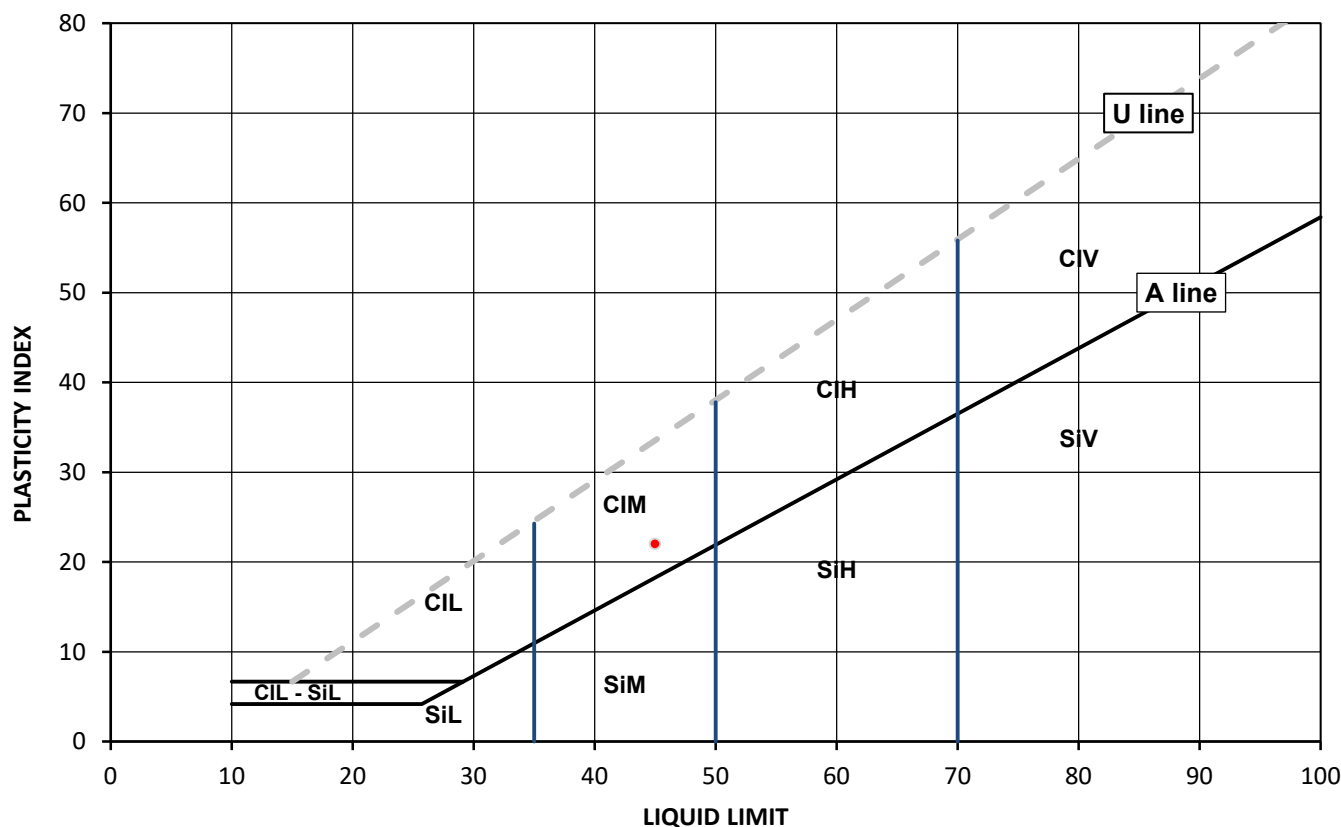
Test Results:

Laboratory Reference: 1819075
Hole No.: CPBH01
Sample Reference: Not Given
Soil Description: Greenish grey slightly sandy CLAY

Depth Top [m]: 18.50
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
34	45	23	22	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
		H High 50 to 70
		V Very high exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

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4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 17/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819076

Hole No.: CPBH01

Sample Reference: Not Given

Soil Description: Brown slightly gravelly very sandy CLAY

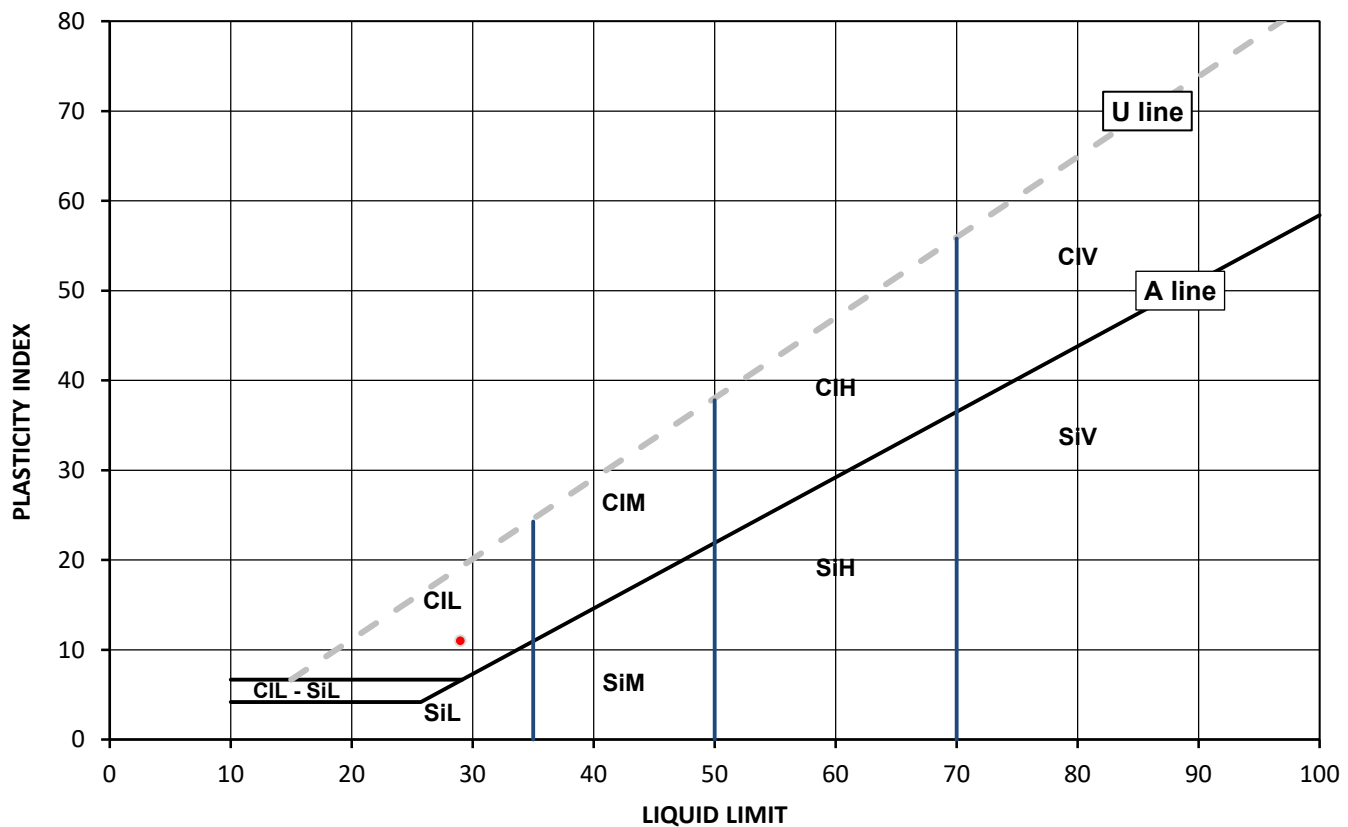
Depth Top [m]: 21.50

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
21	29	18	11	76



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Page 1 of 1

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i2 Analytical Ltd
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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 18/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819078

Hole No.: CPBH02

Sample Reference: Not Given

Soil Description: Brown clayey sandy GRAVEL with cobbles

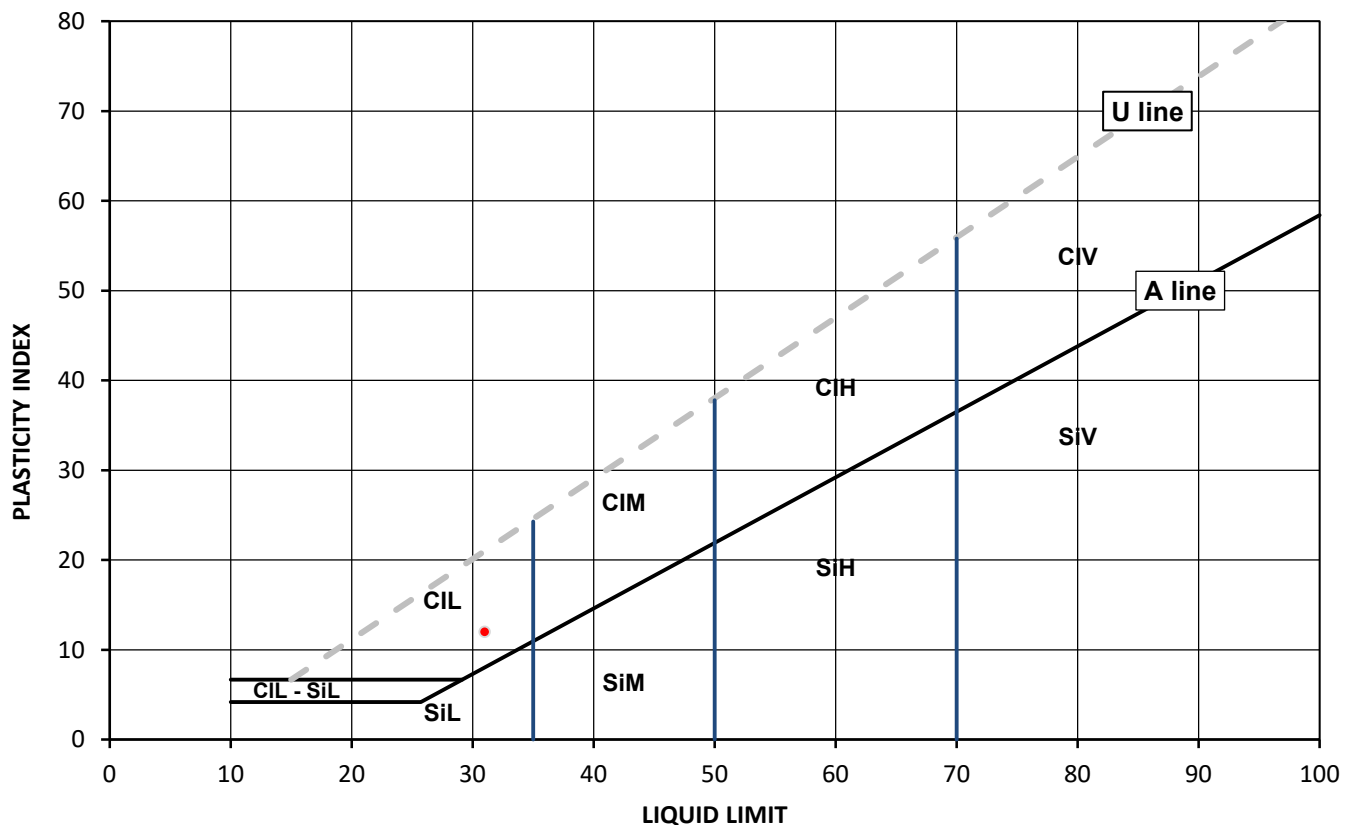
Depth Top [m]: 3.00

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	31	19	12	30



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Page 1 of 1

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TEST CERTIFICATE

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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 18/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819079

Hole No.: CPBH02

Sample Reference: Not Given

Soil Description: Greyish brown very gravelly sandy CLAY with cobbles

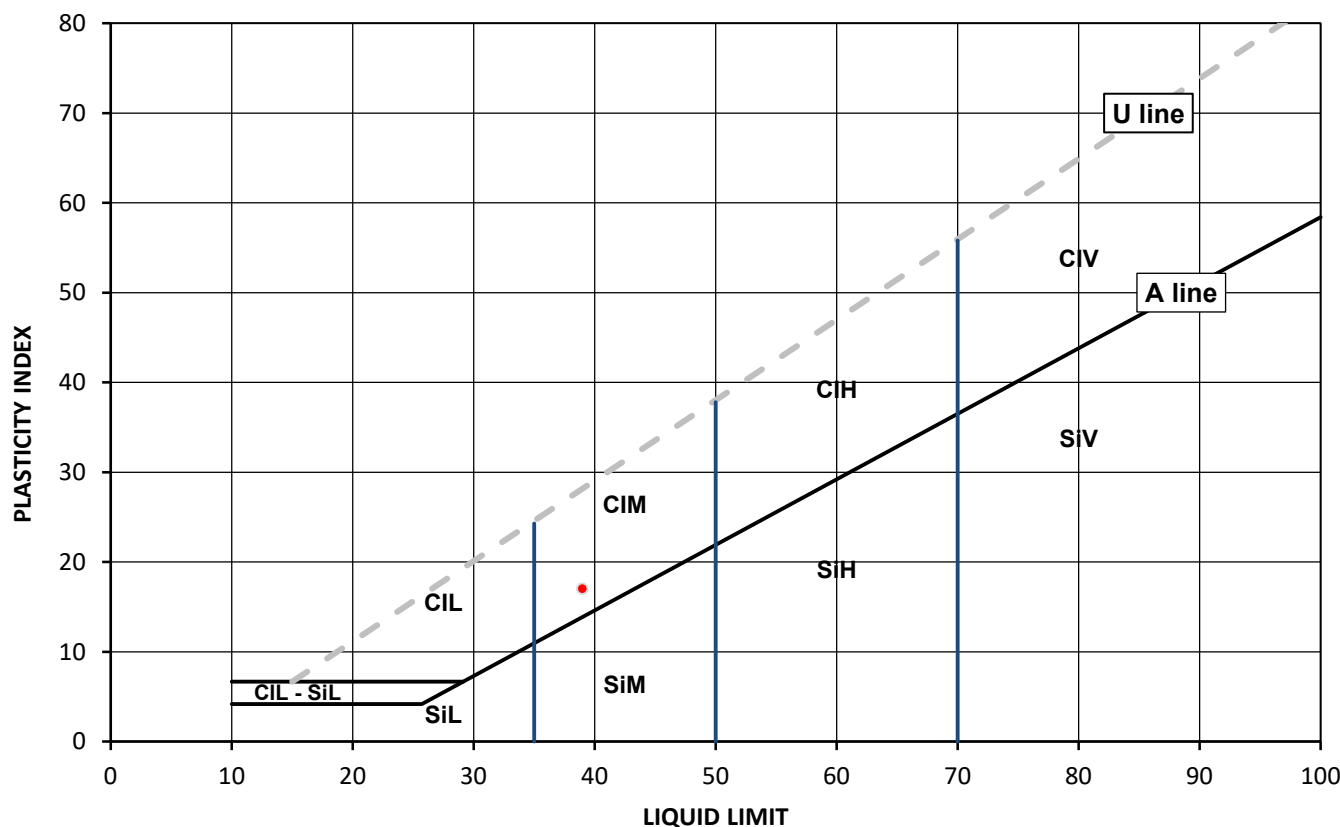
Depth Top [m]: 4.00

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
22	39	22	17	47



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 413800
Job Number: 21-65451
Date Sampled: 18/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

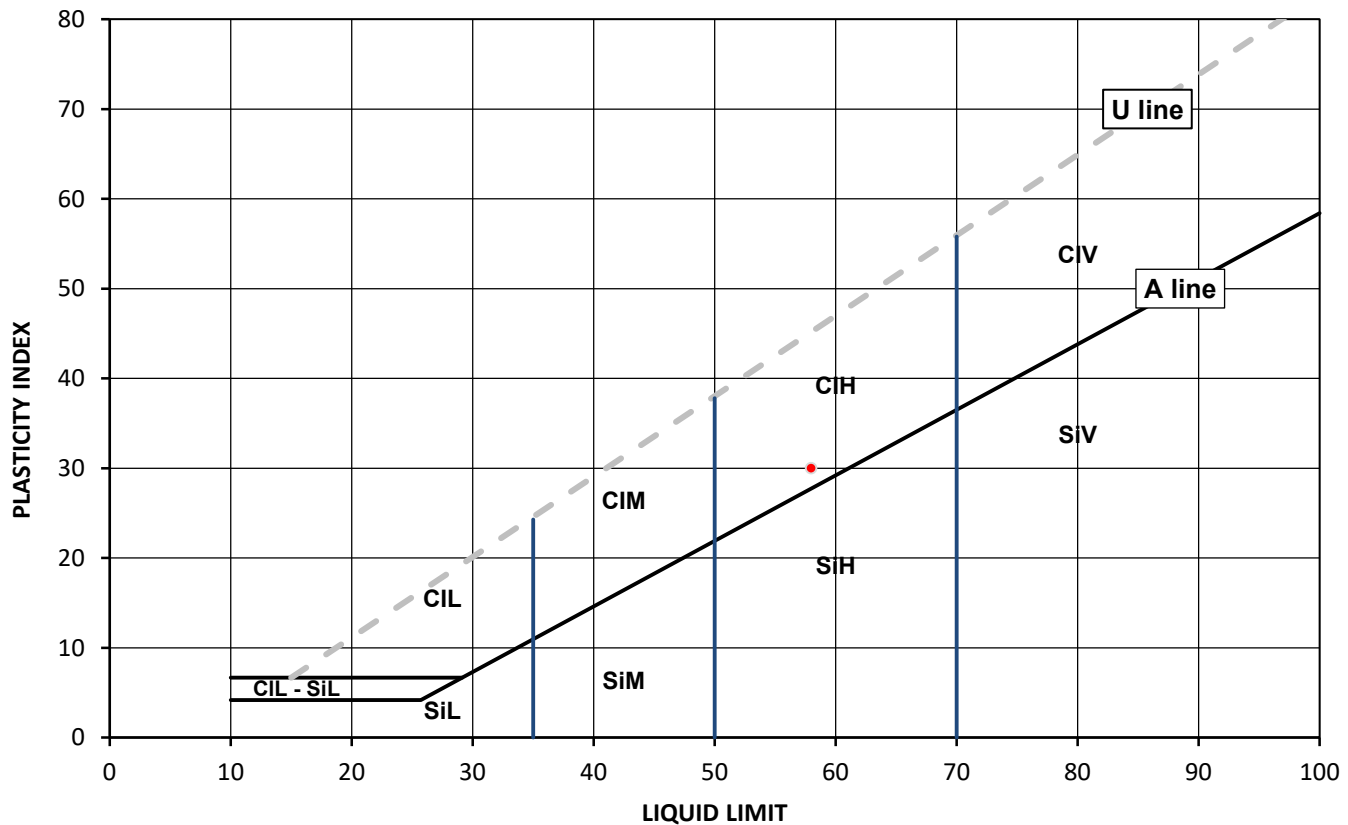
Test Results:

Laboratory Reference: 1819081
Hole No.: CPBH02
Sample Reference: Not Given
Soil Description: Grey slightly gravelly slightly sandy CLAY

Depth Top [m]: 7.00
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
42	58	28	30	70



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl Clay	L Low	below 35
Si Silt	M Medium	35 to 50
	H High	50 to 70
	V Very high	exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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PL Deputy Head of Geotechnical Section
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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 18/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819082

Hole No.: CPBH02

Sample Reference: Not Given

Soil Description: Greyish brown slightly gravelly very sandy CLAY

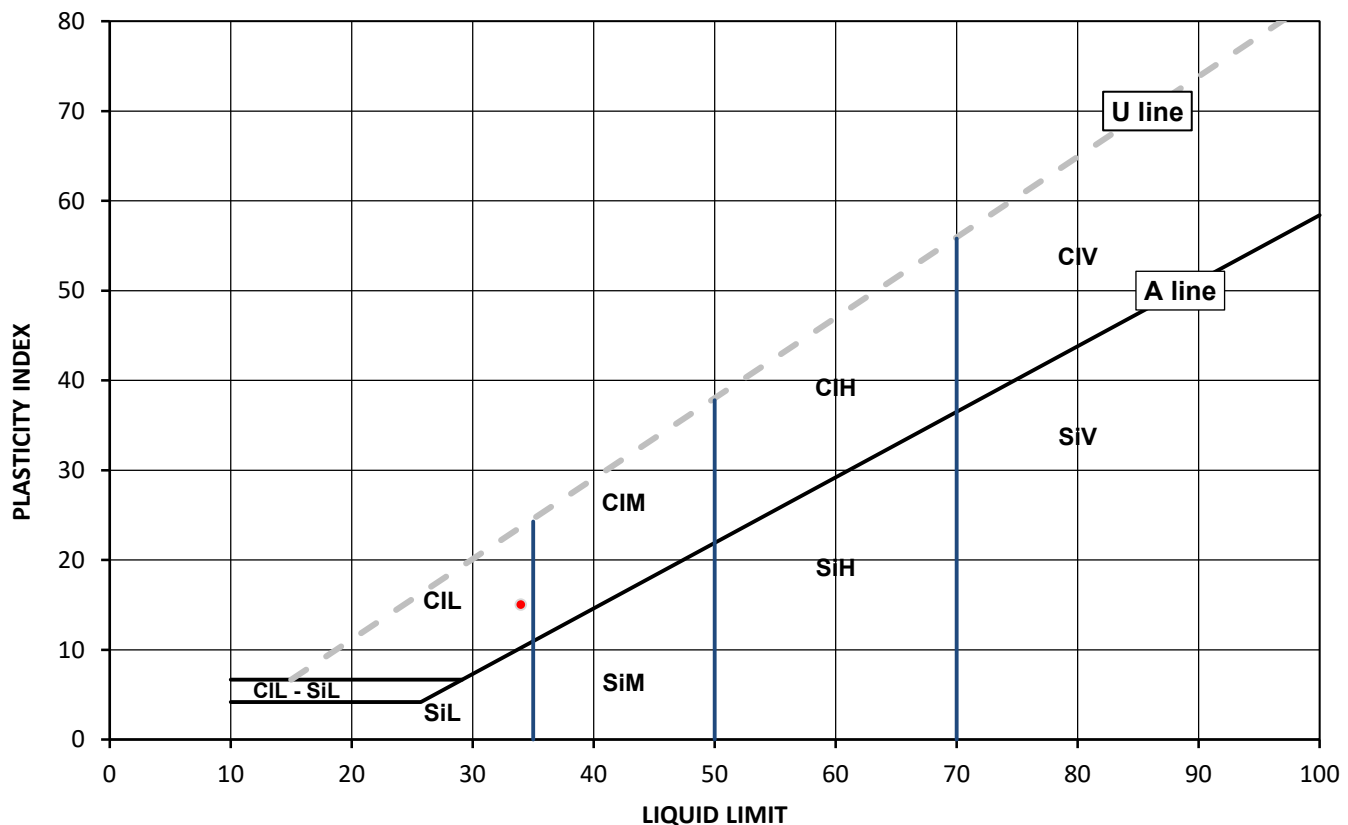
Depth Top [m]: 8.00

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
28	34	19	15	92



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Clay	Plasticity	Liquid Limit
Cl	Clay	L Low	below 35
Si	Silt	M Medium	35 to 50
		H High	50 to 70
		V Very high	exceeding 70
		O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

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Page 1 of 1

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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 19/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819083

Hole No.: CPBH02

Sample Reference: Not Given

Soil Description: Grey slightly sandy CLAY

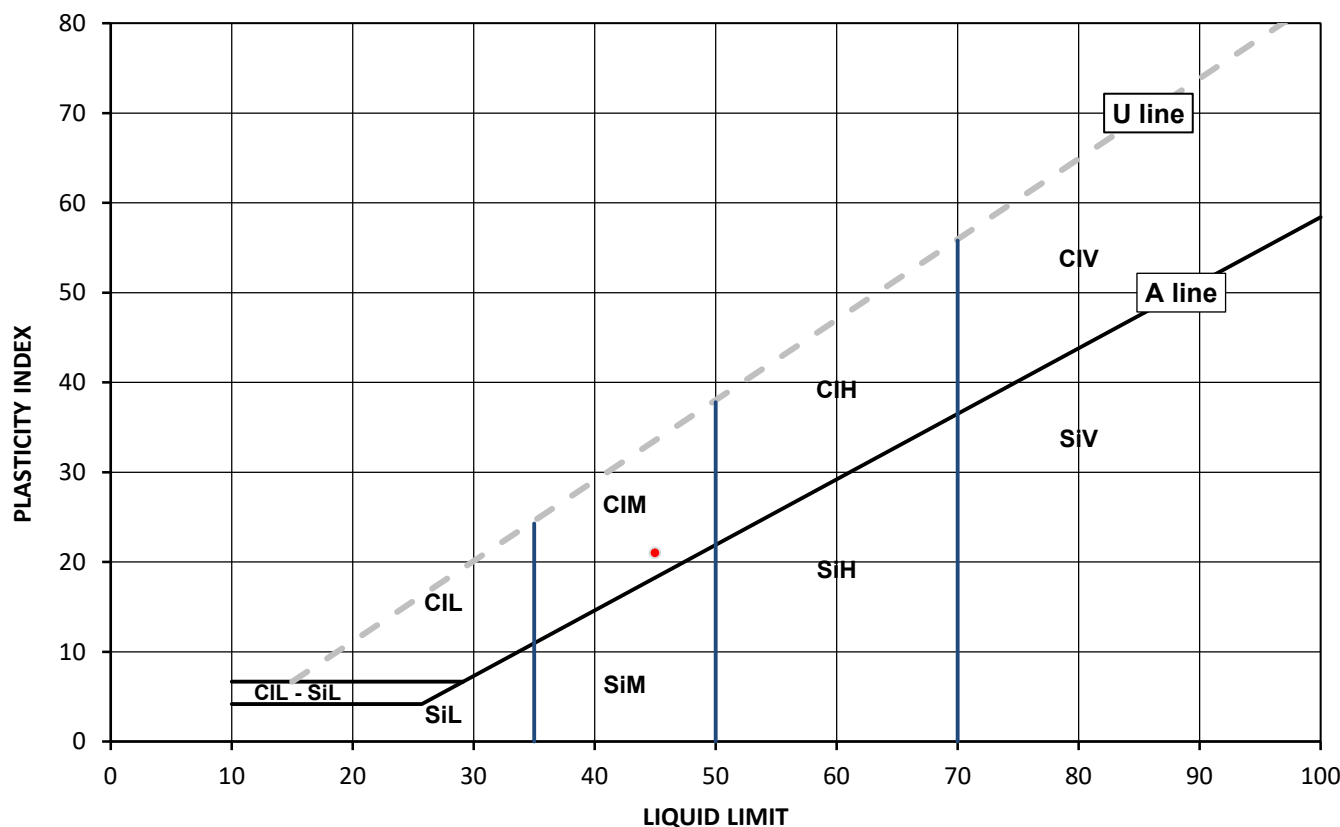
Depth Top [m]: 11.00

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
38	45	24	21	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:



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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 19/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819084

Hole No.: CPBH02

Sample Reference: Not Given

Soil Description: Brownish grey slightly gravelly slightly sandy CLAY

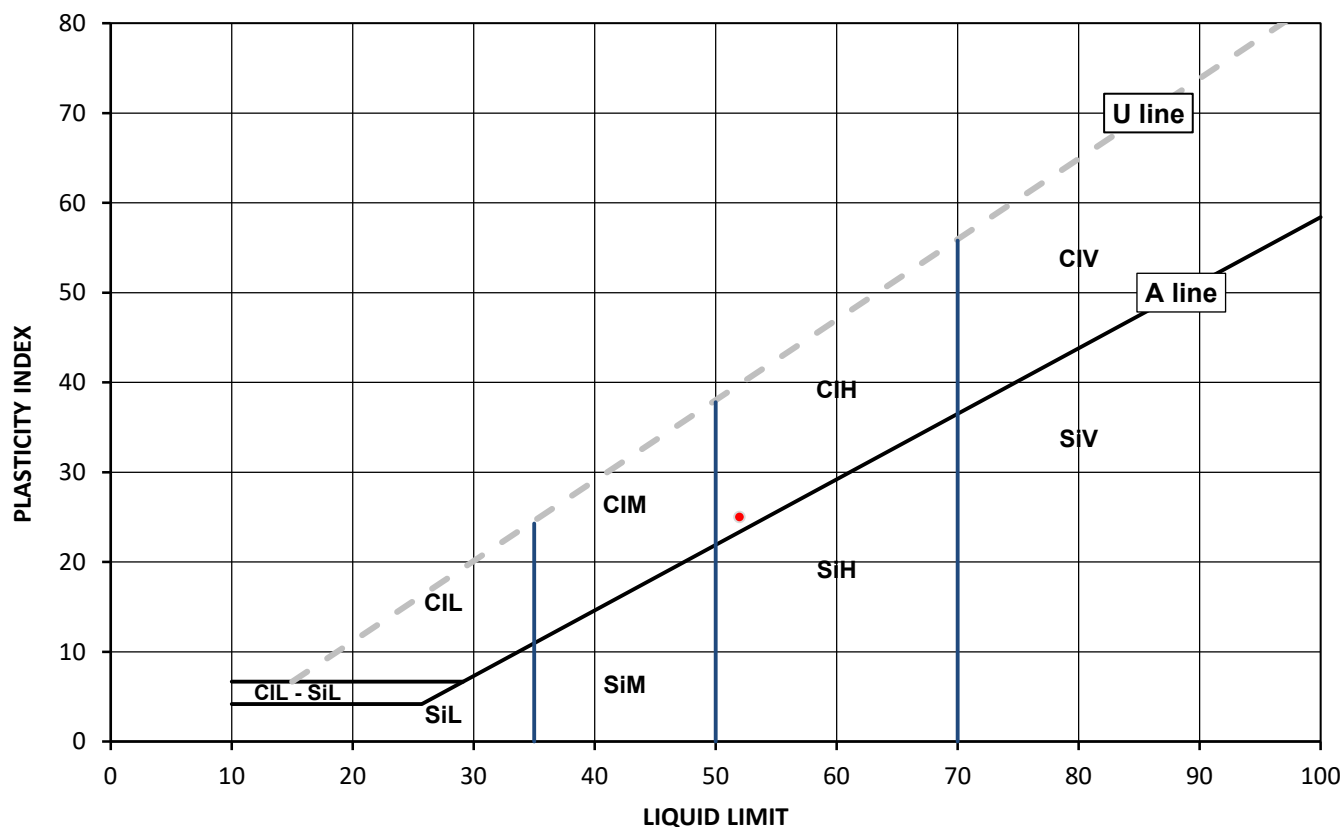
Depth Top [m]: 18.50

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
28	52	27	25	72



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
		H High 50 to 70
		V Very high exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Brackmills Industrial Estate
Northampton NN4 7EB



4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.3 and 5

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 24/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819089

Hole No.: CPBH03

Sample Reference: Not Given

Soil Description: Grey slightly gravelly very sandy CLAY

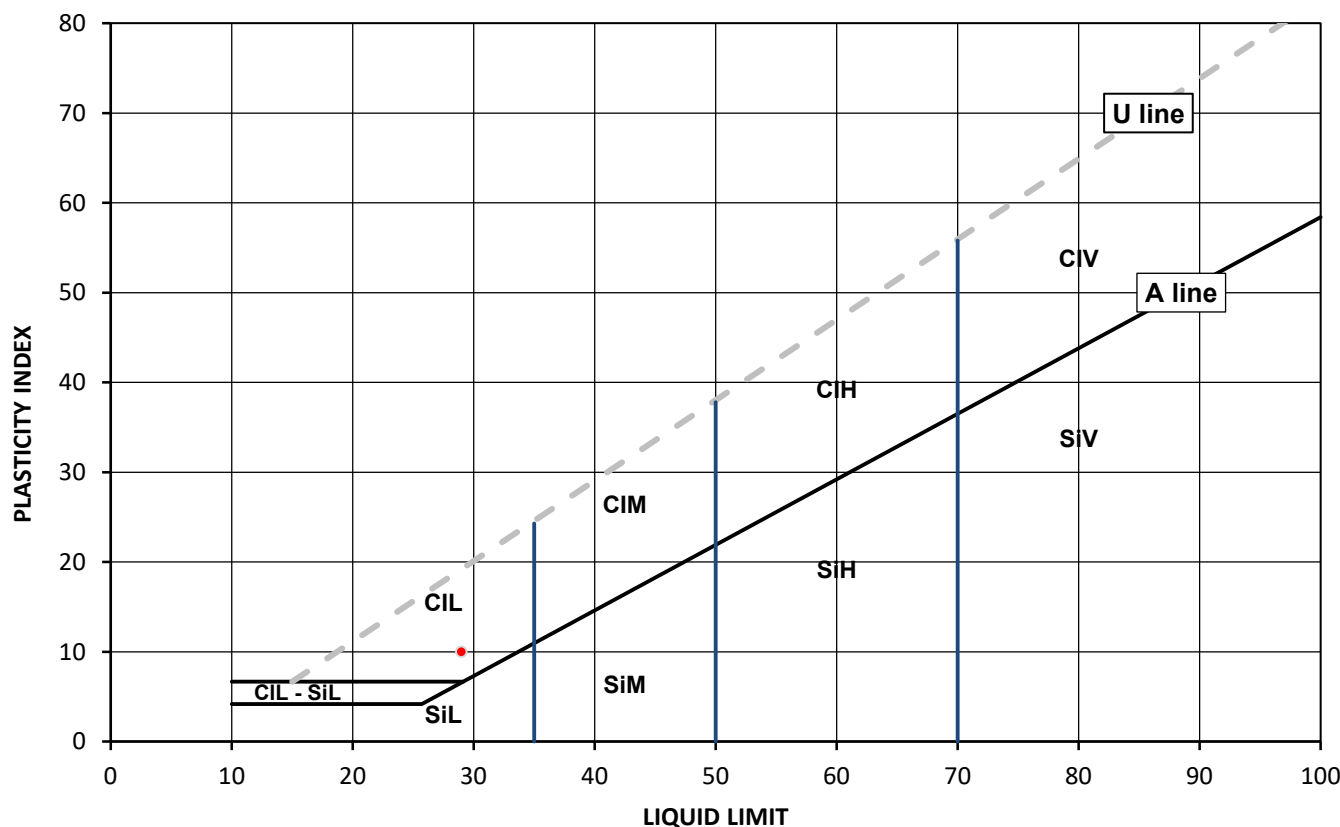
Depth Top [m]: 14.00

Depth Base [m]: Not Given

Sample Type: B

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
29	29	19	10	91



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
		H High 50 to 70
		V Very high exceeding 70
	O Organic	append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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4041

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Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 413800
Job Number: 21-65451
Date Sampled: 24/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

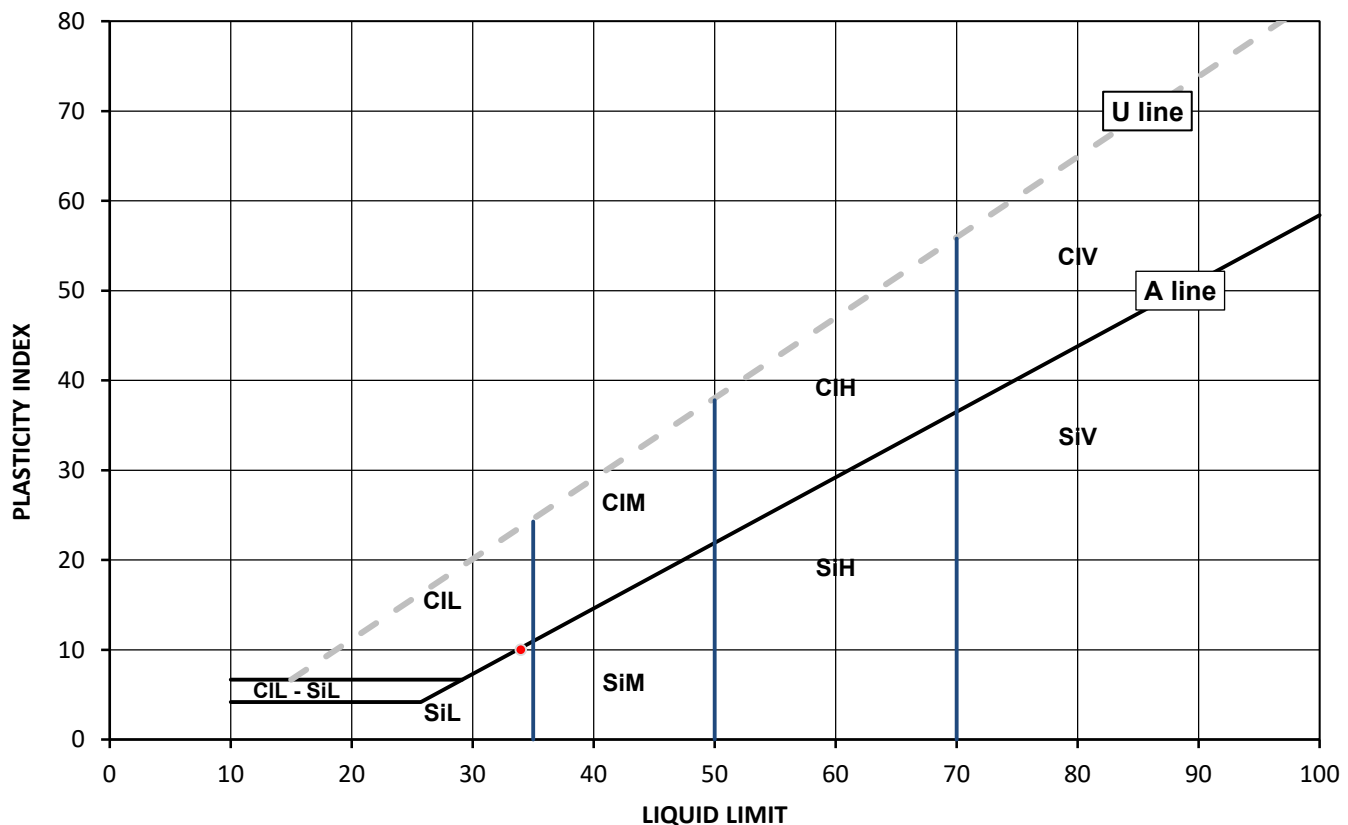
Test Results:

Laboratory Reference: 1819090
Hole No.: CPBH03
Sample Reference: Not Given
Soil Description: Grey very sandy silty CLAY

Depth Top [m]: 18.50
Depth Base [m]: Not Given
Sample Type: B

Sample Preparation: Tested in natural condition

As Received Moisture Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	34	24	10	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

	Plasticity	Liquid Limit
Cl	Clay	L Low below 35
Si	Silt	M Medium 35 to 50
	H High 50 to 70	V Very high exceeding 70
	O Organic	O append to classification for organic material (eg CIHO)

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

Client: TRC Companies Ltd

Client Address: 20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling
Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 16/02 - 19/02/2021

Date Received: 01/03/2021

Date Tested: 08/04 - 14/04/2021

Sampled By: Client

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m															
1819072	CPBH01	Not Given	12.50	Not Given	B	Grey sandy CLAY	Atterberg 4 Point	37		100	44	21	23						
1819073	CPBH01	Not Given	13.00	Not Given	B	Brownish grey sandy CLAY	Atterberg 4 Point	34		100	37	18	19						
1819074	CPBH01	Not Given	15.50	Not Given	B	Grey slightly sandy CLAY	Atterberg 4 Point	40		100	45	22	23						
1819075	CPBH01	Not Given	18.50	Not Given	B	Greenish grey slightly sandy CLAY	Atterberg 4 Point	34		100	45	23	22						
1819076	CPBH01	Not Given	21.50	Not Given	B	Brown slightly gravelly very sandy CLAY	Atterberg 4 Point	21		76	29	18	11						
1819078	CPBH02	Not Given	3.00	Not Given	B	Brown clayey sandy GRAVEL with cobbles	Atterberg 4 Point	14		30	31	19	12						
1819079	CPBH02	Not Given	4.00	Not Given	B	Greyish brown very gravelly sandy CLAY with cobbles	Atterberg 4 Point	22		47	39	22	17						
1819081	CPBH02	Not Given	7.00	Not Given	B	Grey slightly gravelly slightly sandy CLAY	Atterberg 4 Point	42		70	58	28	30						
1819082	CPBH02	Not Given	8.00	Not Given	B	Greyish brown slightly gravelly very sandy CLAY	Atterberg 4 Point	28		92	34	19	15						
1819083	CPBH02	Not Given	11.00	Not Given	B	Grey slightly sandy CLAY	Atterberg 4 Point	38		100	45	24	21						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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4041

Client: TRC Companies Ltd

Client Address: 20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling
Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

SUMMARY REPORT

Summary of Classification Test Results

Tested in Accordance with:

Moisture Content by BS 1377-2: 1990: Clause 3.2; Water Content by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 15/02 - 24/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

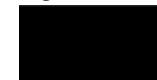
Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Moisture Content [W]	Water Content [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1819084	CPBH02	Not Given	18.50	Not Given	B	Brownish grey slightly gravelly slightly sandy CLAY	Atterberg 4 Point	28		72	52	27	25						
1819088	CPBH03	Not Given	11.00	Not Given	B	Greyish brown slightly gravelly very sandy CLAY		25											
1819089	CPBH03	Not Given	14.00	Not Given	B	Grey slightly gravelly very sandy CLAY	Atterberg 4 Point	29		91	29	19	10						
1819090	CPBH03	Not Given	18.50	Not Given	B	Grey very sandy silty CLAY	Atterberg 4 Point	30		100	34	24	10						
1819067	TP05	Not Given	2.50	Not Given	B	Brown slightly gravelly slightly sandy CLAY	Atterberg 4 Point	35		92	51	24	27						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

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PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

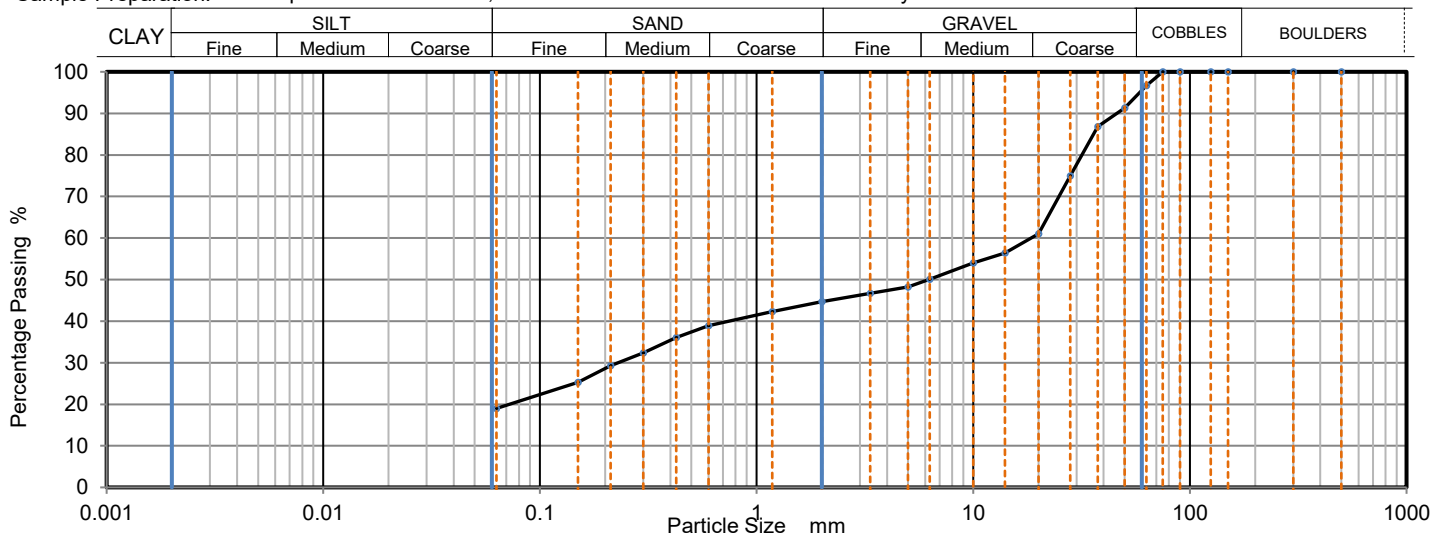
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 15/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819065
Hole No.: TP02
Sample Reference: Not Given
Sample Description: Dark grey clayey sandy GRAVEL with fragments of brick, concrete
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 0.90
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	97		
50	91		
37.5	87		
28	75		
20	61		
14	56		
10	54		
6.3	50		
5	48		
3.35	47		
2	45		
1.18	42		
0.6	39		
0.425	36		
0.3	32		
0.212	29		
0.15	25		
0.063	20		

Sample Proportions	% dry mass
Very coarse	3
Gravel	52
Sand	25
Fines <0.063mm	20

Grading Analysis	
D100	75
D60	18.5
D30	0.23
D10	
Uniformity Coefficient	> 290
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

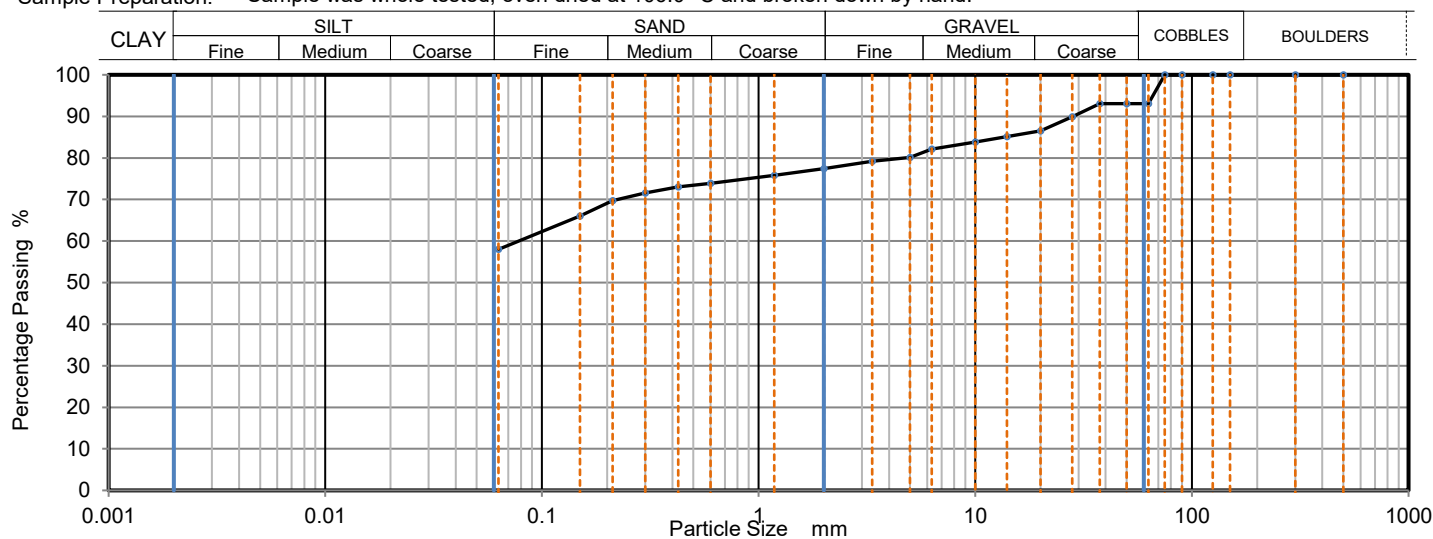
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 15/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819066
Hole No.: TP04
Sample Reference: Not Given
Sample Description: Brown gravelly sandy CLAY
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 0.40
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	93		
50	93		
37.5	93		
28	90		
20	87		
14	85		
10	84		
6.3	82		
5	80		
3.35	79		
2	77		
1.18	76		
0.6	74		
0.425	73		
0.3	72		
0.212	70		
0.15	66		
0.063	58		

Sample Proportions	% dry mass
Very coarse	7
Gravel	16
Sand	19
Fines <0.063mm	58

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 1.2
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

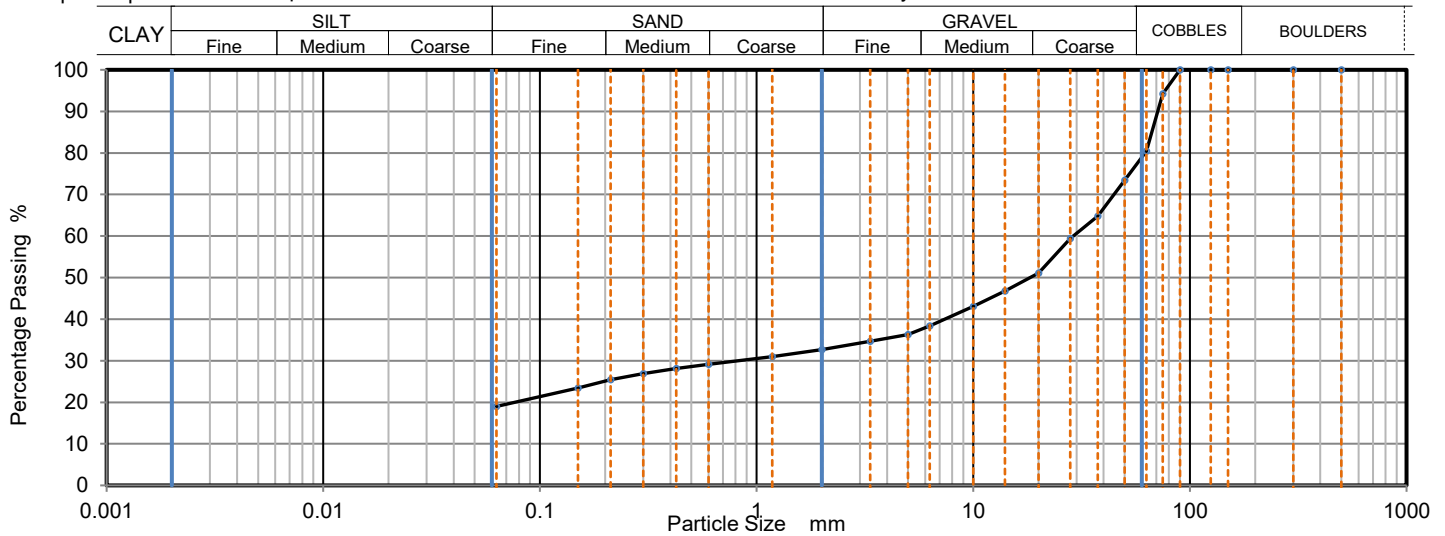
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 15/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819068
Hole No.: TP06
Sample Reference: Not Given
Sample Description: Mottled brown clayey sandy GRAVEL with cobbles
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.80
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	94		
63	80		
50	73		
37.5	65		
28	59		
20	51		
14	47		
10	43		
6.3	38		
5	36		
3.35	35		
2	33		
1.18	31		
0.6	29		
0.425	28		
0.3	27		
0.212	25		
0.15	23		
0.063	20		

Sample Proportions	% dry mass
Very coarse	20
Gravel	48
Sand	13
Fines <0.063mm	20

Grading Analysis	
D100	mm 90
D60	mm 28.9
D30	mm 0.82
D10	mm
Uniformity Coefficient	> 460
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:



Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

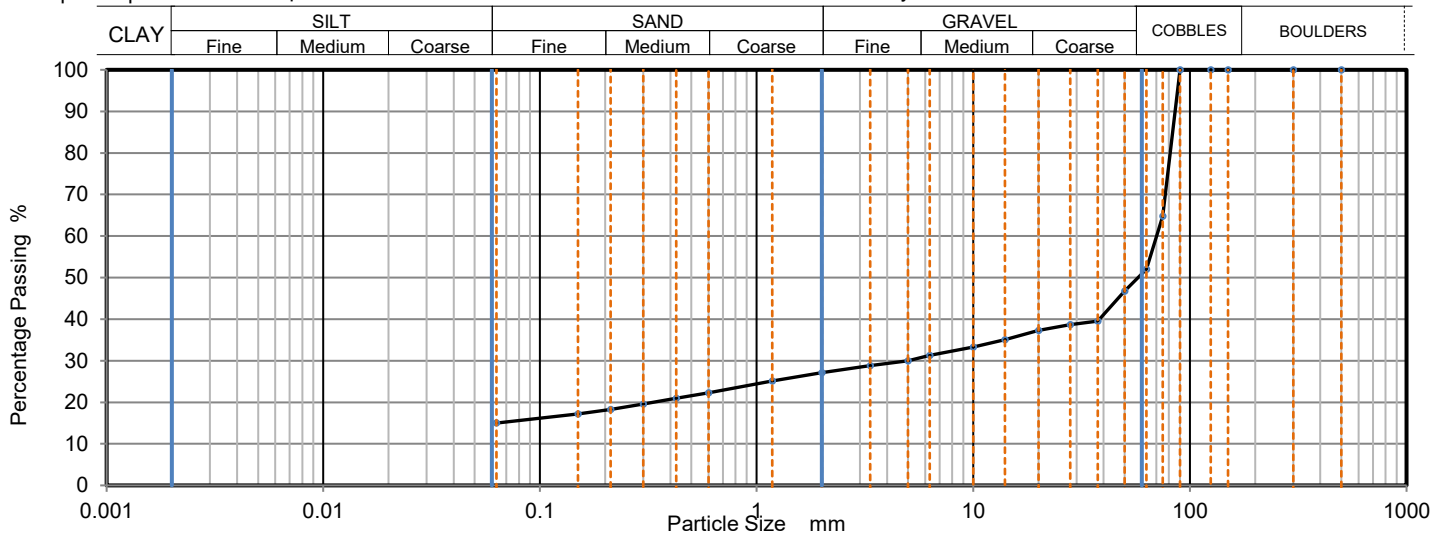
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 15/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819069
Hole No.: CPBH01
Sample Reference: Not Given
Sample Description: Brown clayey sandy GRAVEL with cobbles
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	65		
63	52		
50	47		
37.5	40		
28	39		
20	37		
14	35		
10	33		
6.3	31		
5	30		
3.35	29		
2	27		
1.18	25		
0.6	22		
0.425	21		
0.3	20		
0.212	18		
0.15	17		
0.063	16		

Sample Proportions	% dry mass
Very coarse	48
Gravel	25
Sand	11
Fines <0.063mm	16

Grading Analysis	
D100	mm 90
D60	mm 70.2
D30	mm 5.02
D10	mm
Uniformity Coefficient	> 1100
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 15/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819070

Hole No.: CPBH01

Sample Reference: Not Given

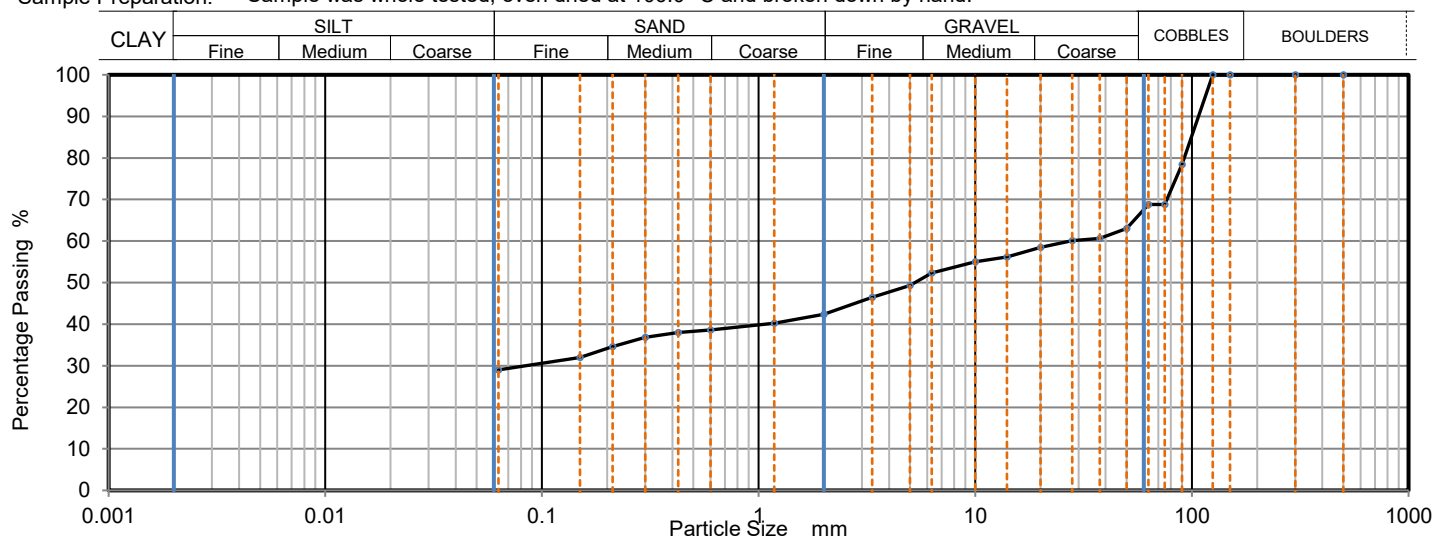
Sample Description: Brown sandy very gravelly CLAY with fragments of brick, wood

Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 5.00

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	78		
75	69		
63	69		
50	63		
37.5	61		
28	60		
20	59		
14	56		
10	55		
6.3	52		
5	49		
3.35	47		
2	42		
1.18	40		
0.6	39		
0.425	38		
0.3	37		
0.212	35		
0.15	32		
0.063	29		

Sample Proportions	% dry mass
Very coarse	31
Gravel	26
Sand	13
Fines <0.063mm	29

Grading Analysis	
D100	mm 125
D60	mm 27.4
D30	mm 0.0764
D10	mm
Uniformity Coefficient	> 440
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

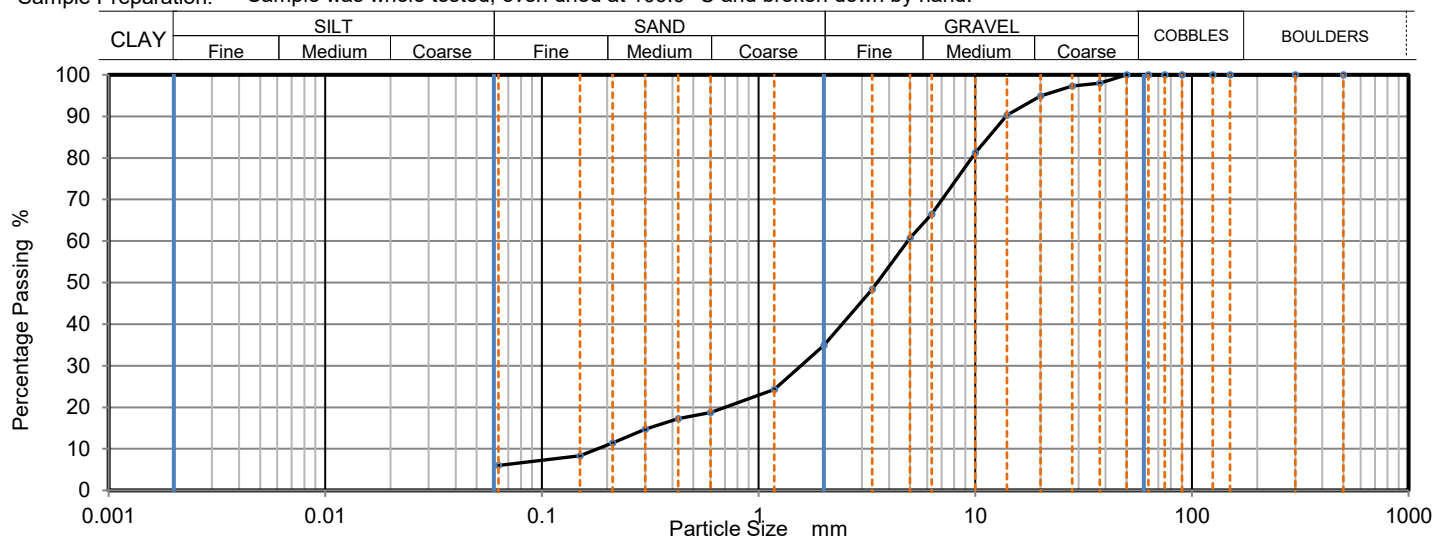
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 16/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819071
Hole No.: CPBH01
Sample Reference: Not Given
Sample Description: Brown slightly clayey sandy GRAVEL
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 11.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	97		
20	95		
14	90		
10	81		
6.3	67		
5	61		
3.35	48		
2	35		
1.18	24		
0.6	19		
0.425	17		
0.3	15		
0.212	11		
0.15	8		
0.063	6		

Sample Proportions	% dry mass
Very coarse	0
Gravel	65
Sand	29
Fines <0.063mm	6

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

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 18/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819078

Hole No.: CPBH02

Sample Reference: Not Given

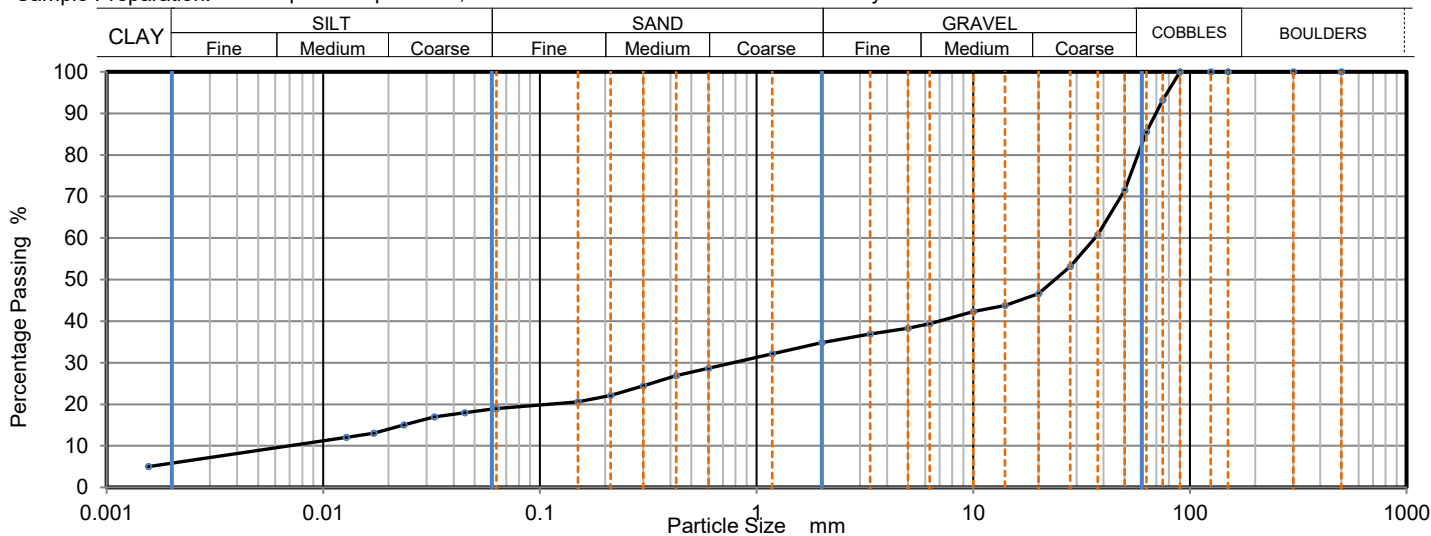
Sample Description: Brown clayey sandy GRAVEL with cobbles

Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 3.00

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0626	19
300	100	0.0450	18
150	100	0.0326	17
125	100	0.0235	15
90	100	0.0171	13
75	93	0.0128	12
63	86	0.0016	5
50	72		
37.5	61		
28	53		
20	47		
14	44		
10	42		
6.3	39		
5	38		
3.35	37	Particle density (assumed) 2.65 Mg/m3	
2	35		
1.18	32		
0.6	29		
0.425	27		
0.3	24		
0.212	22		
0.15	21		
0.063	19		

Sample Proportions	% dry mass
Very coarse	14
Gravel	51
Sand	16
Silt	13
Clay	6

Grading Analysis	
D100	mm 90
D60	mm 36.4
D30	mm 0.776
D10	mm 0.00682
Uniformity Coefficient	5300
Curvature Coefficient	2.4

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

Signed:



Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 18/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819079

Hole No.: CPBH02

Sample Reference: Not Given

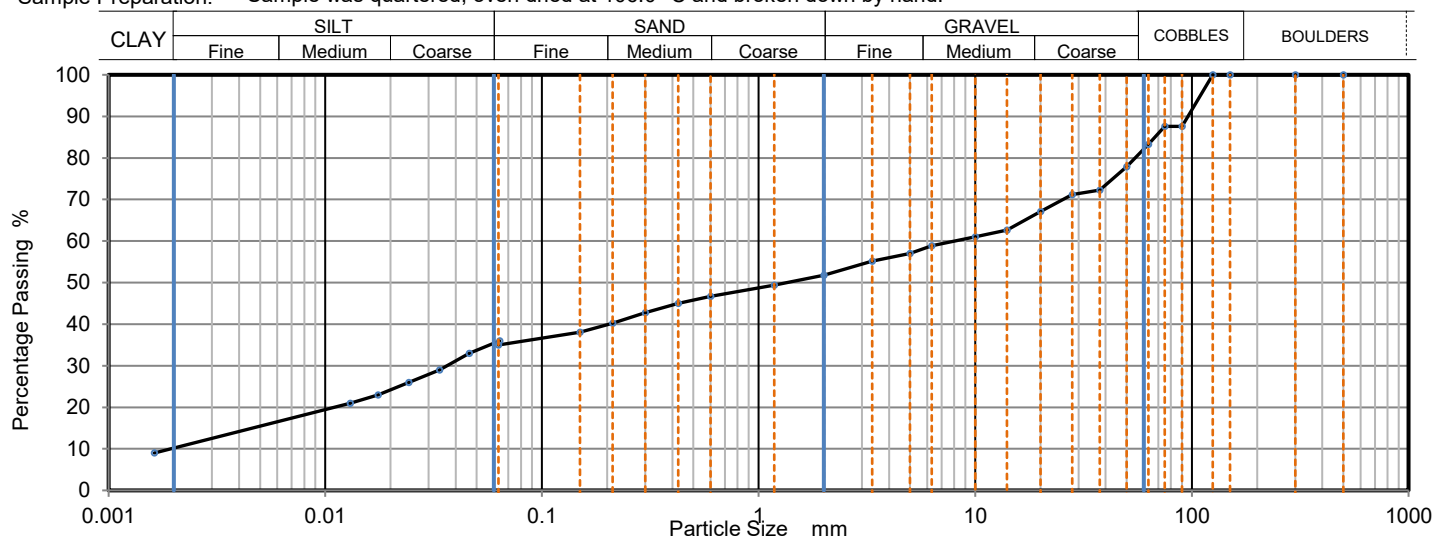
Sample Description: Greyish brown very gravelly sandy CLAY with cobbles

Sample Preparation: Sample was quartered, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 4.00

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0638	36
300	100	0.0462	33
150	100	0.0336	29
125	100	0.0243	26
90	88	0.0175	23
75	88	0.0130	21
63	83	0.0016	9
50	78		
37.5	72		
28	71		
20	67		
14	63		
10	61		
6.3	59		
5	57		
3.35	55	Particle density (assumed) 2.65 Mg/m ³	
2	52		
1.18	49		
0.6	47		
0.425	45		
0.3	43		
0.212	40		
0.15	38		
0.063	36		

Sample Proportions	% dry mass
Very coarse	17
Gravel	31
Sand	16
Silt	26
Clay	10

Grading Analysis	
D100	mm 125
D60	mm 8.08
D30	mm 0.0367
D10	mm 0.00184
Uniformity Coefficient	4400
Curvature Coefficient	0.091

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 18/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819080

Hole No.: CPBH02

Sample Reference: Not Given

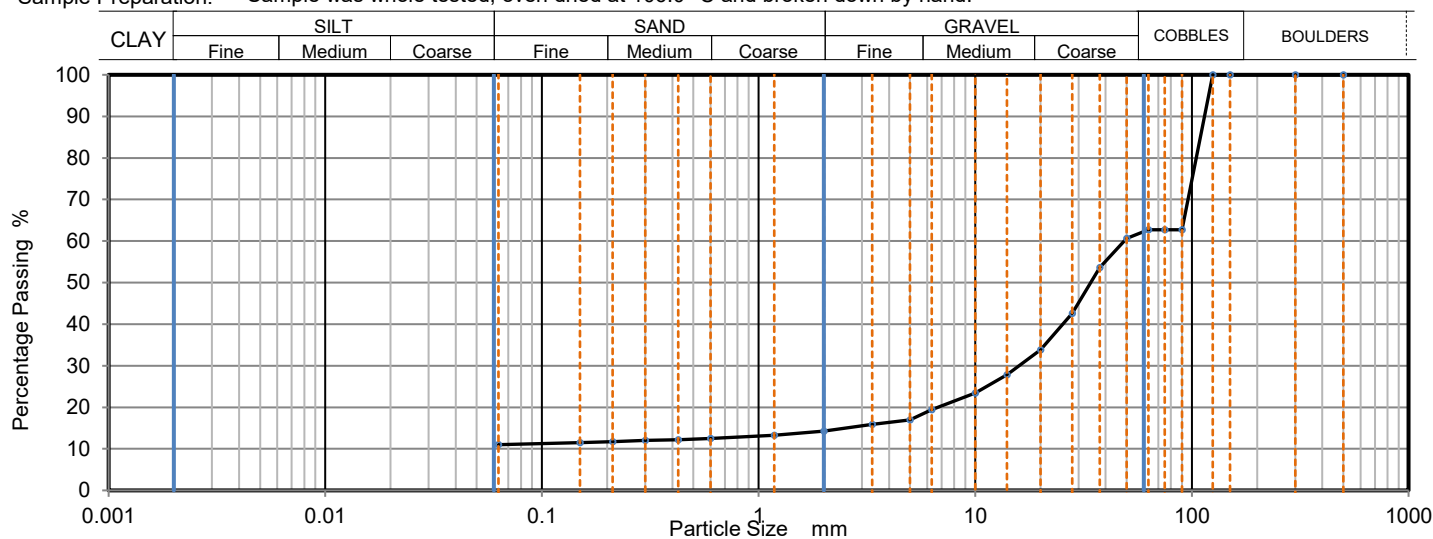
Sample Description: Brown slightly sandy clayey GRAVEL with cobbles

Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 5.00

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	63		
75	63		
63	63		
50	61		
37.5	54		
28	43		
20	34		
14	28		
10	23		
6.3	19		
5	17		
3.35	16		
2	14		
1.18	13		
0.6	13		
0.425	12		
0.3	12		
0.212	12		
0.15	12		
0.063	11		

Sample Proportions	% dry mass
Very coarse	37
Gravel	48
Sand	3
Fines <0.063mm	11

Grading Analysis	
D100	mm 125
D60	mm 48.7
D30	mm 15.9
D10	mm
Uniformity Coefficient	> 770
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

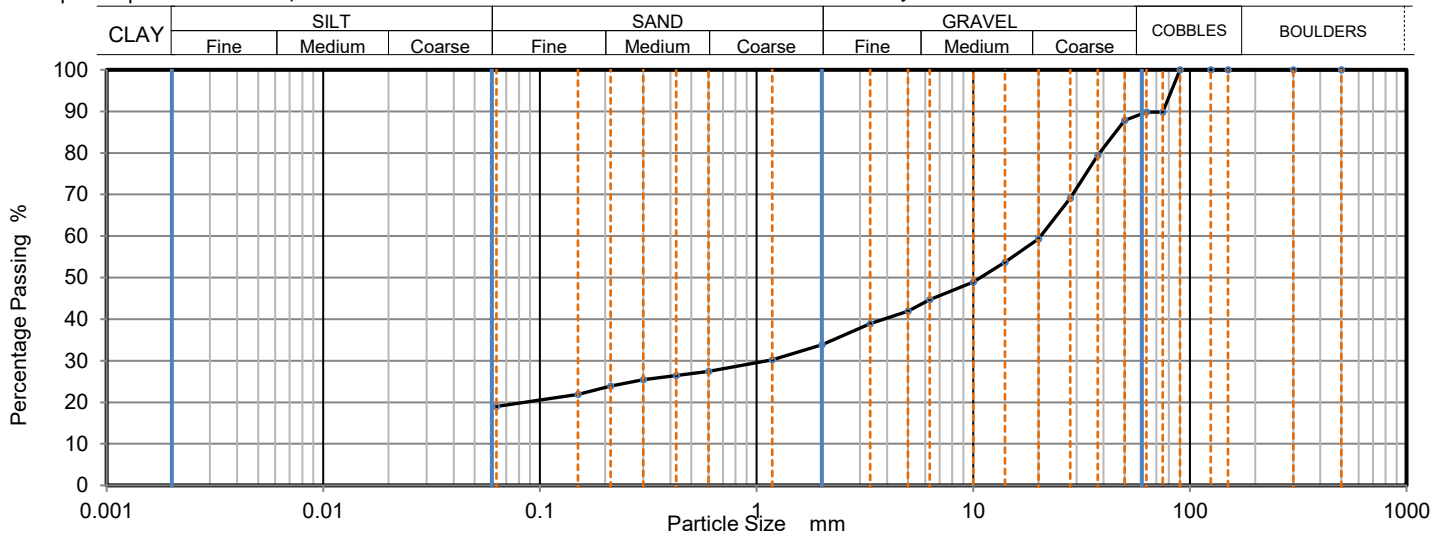
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 19/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819085
Hole No.: CPBH02
Sample Reference: Not Given
Sample Description: Brown clayey sandy GRAVEL with cobbles
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 21.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	90		
63	90		
50	88		
37.5	79		
28	69		
20	59		
14	54		
10	49		
6.3	45		
5	42		
3.35	39		
2	34		
1.18	30		
0.6	27		
0.425	26		
0.3	25		
0.212	24		
0.15	22		
0.063	20		

Sample Proportions	% dry mass
Very coarse	10
Gravel	56
Sand	14
Fines <0.063mm	20

Grading Analysis	
D100	mm 90
D60	mm 20.5
D30	mm 1.11
D10	mm
Uniformity Coefficient	> 330
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

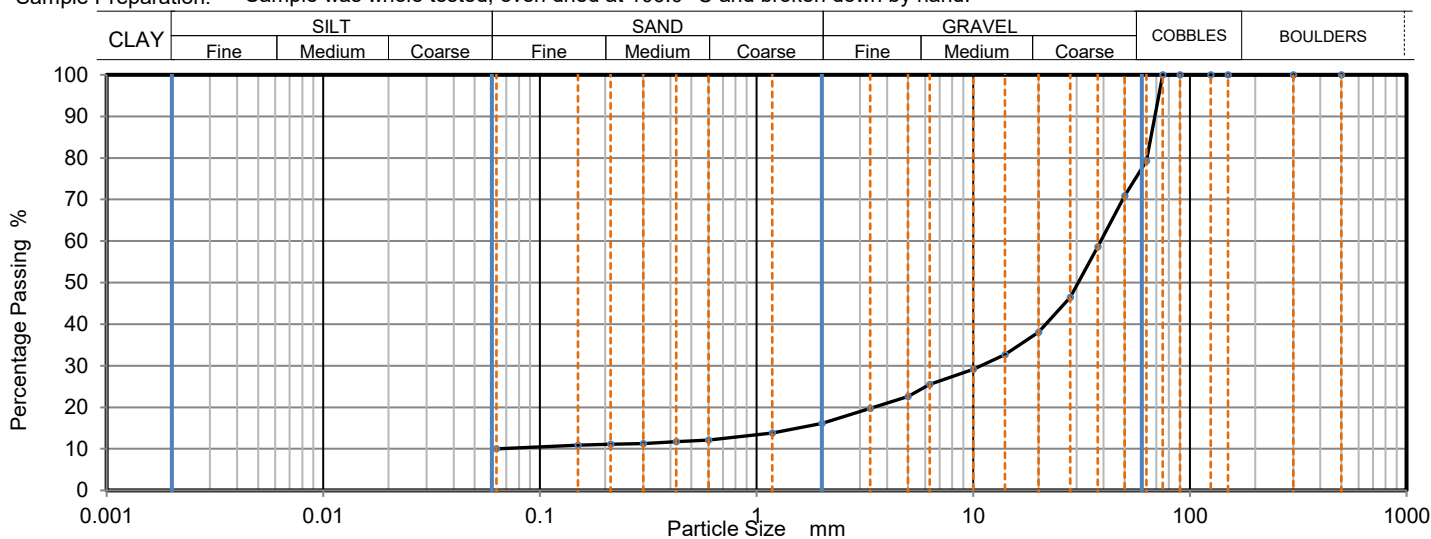
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 23/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819086
Hole No.: CPBH03
Sample Reference: Not Given
Sample Description: Brown clayey slightly sandy GRAVEL with cobbles
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 3.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	79		
50	71		
37.5	59		
28	47		
20	38		
14	33		
10	29		
6.3	26		
5	23		
3.35	20		
2	16		
1.18	14		
0.6	12		
0.425	12		
0.3	11		
0.212	11		
0.15	11		
0.063	11		

Sample Proportions	% dry mass
Very coarse	21
Gravel	63
Sand	5
Fines <0.063mm	11

Grading Analysis	
D100	mm 75
D60	mm 38.7
D30	mm 10.9
D10	mm
Uniformity Coefficient	> 610
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

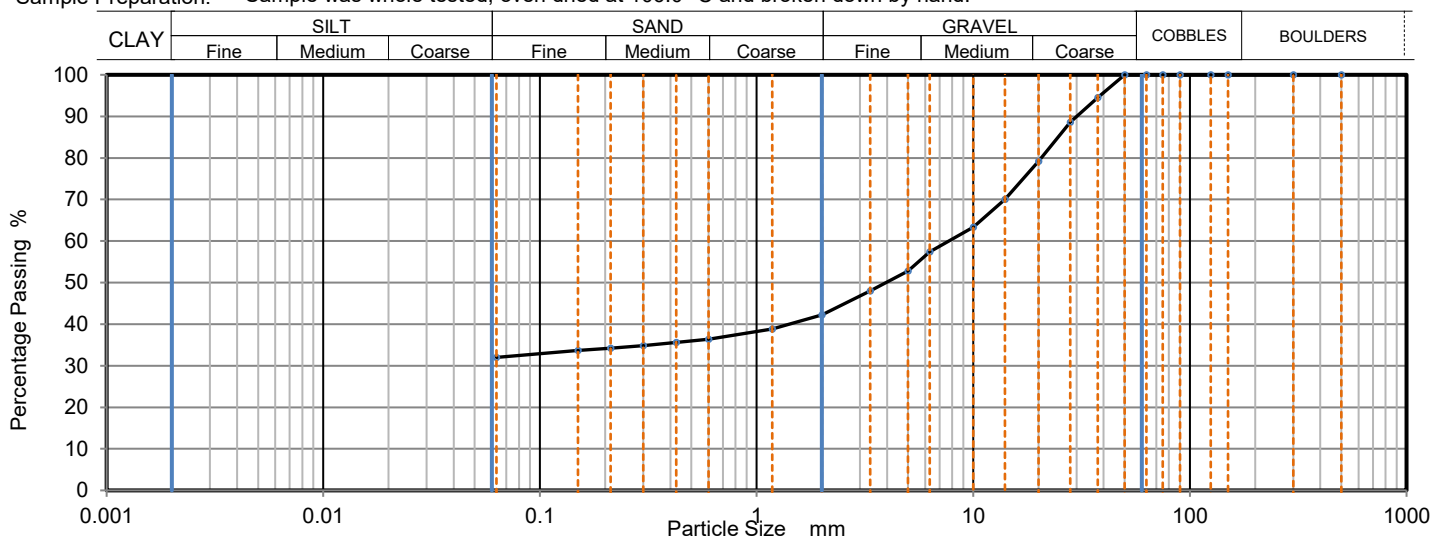
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 23/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819087
Hole No.: CPBH03
Sample Reference: Not Given
Sample Description: Brownish grey slightly sandy very clayey GRAVEL
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 6.50
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	89		
20	79		
14	70		
10	63		
6.3	57		
5	53		
3.35	48		
2	42		
1.18	39		
0.6	36		
0.425	36		
0.3	35		
0.212	34		
0.15	34		
0.063	33		

Sample Proportions	% dry mass
Very coarse	0
Gravel	58
Sand	9
Fines <0.063mm	33

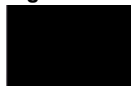
Grading Analysis	
D100	mm 50
D60	mm 7.7
D30	mm
D10	mm
Uniformity Coefficient	> 120
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

Signed:



Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

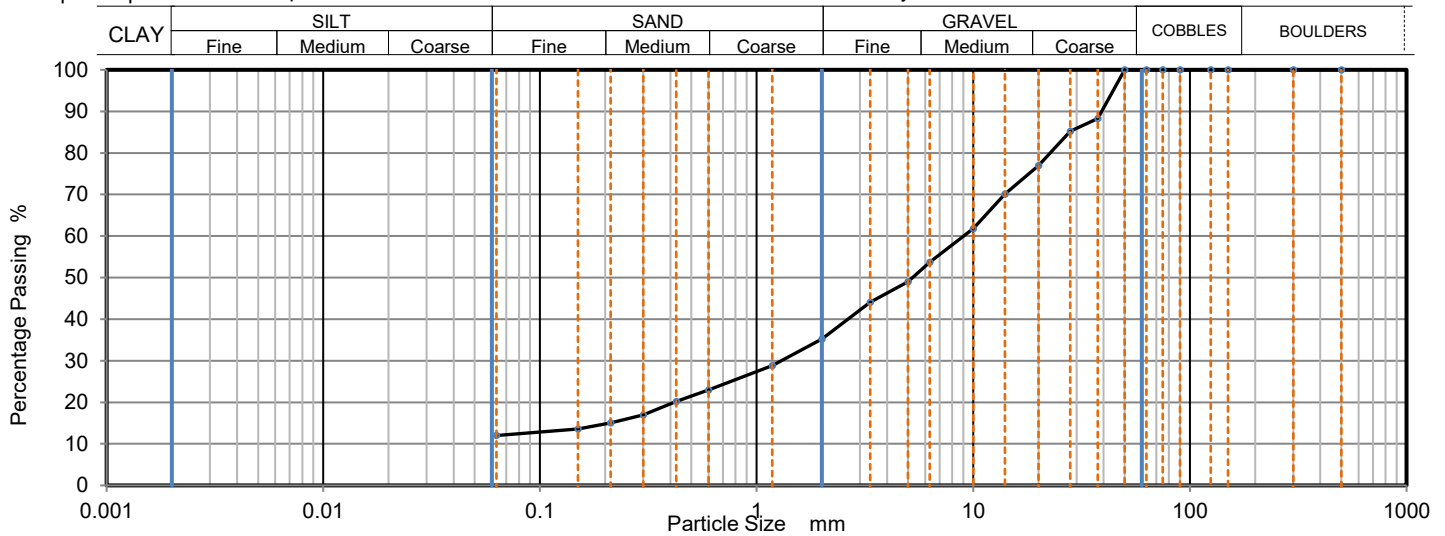
Client Reference: 413800
Job Number: 21-65451
Date Sampled: 25/02/2021
Date Received: 01/03/2021
Date Tested: 14/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 1819092
Hole No.: CPBH04
Sample Reference: Not Given
Sample Description: Brown clayey sandy GRAVEL
Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 2.00
Depth Base [m]: Not Given
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	85		
20	77		
14	70		
10	62		
6.3	54		
5	49		
3.35	44		
2	35		
1.18	29		
0.6	23		
0.425	20		
0.3	17		
0.212	15		
0.15	14		
0.063	12		

Sample Proportions	% dry mass
Very coarse	0
Gravel	65
Sand	23
Fines <0.063mm	12

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	> 140
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

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PL Deputy Head of Geotechnical Section
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TEST CERTIFICATE

Particle Size Distribution

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Tested in Accordance with: BS 1377-2: 1990

Client: TRC Companies Ltd

Client Address:

20 Red Lion Street, London, WC1R 4PQ

Contact: Martin Dorfling

Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Client Reference: 413800

Job Number: 21-65451

Date Sampled: 25/02/2021

Date Received: 01/03/2021

Date Tested: 14/04/2021

Sampled By: Client

Test Results:

Laboratory Reference: 1819093

Hole No.: CPBH04

Sample Reference: Not Given

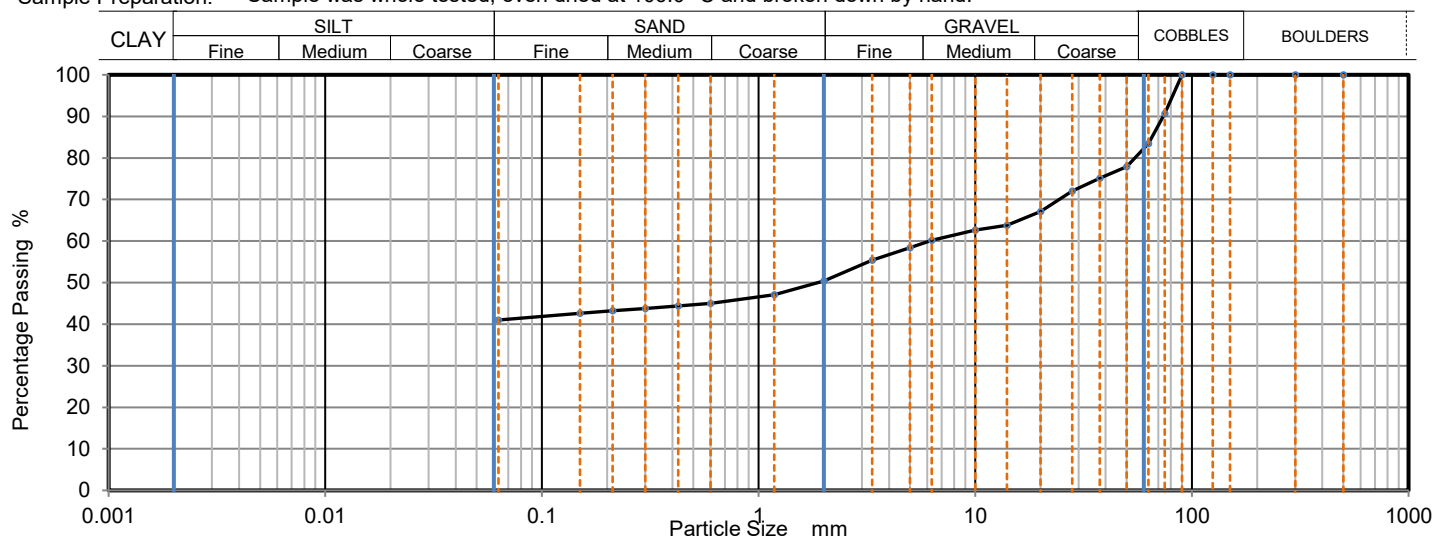
Sample Description: Reddish brown slightly sandy very gravelly CLAY with cobbles

Sample Preparation: Sample was whole tested, oven dried at 106.0 °C and broken down by hand.

Depth Top [m]: 6.50

Depth Base [m]: Not Given

Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	91		
63	83		
50	78		
37.5	75		
28	72		
20	67		
14	64		
10	63		
6.3	60		
5	58		
3.35	55		
2	50		
1.18	47		
0.6	45		
0.425	44		
0.3	44		
0.212	43		
0.15	43		
0.063	42		

Sample Proportions	% dry mass
Very coarse	17
Gravel	33
Sand	9
Fines <0.063mm	41

Grading Analysis	
D100	mm 90
D60	mm 6.13
D30	mm
D10	mm
Uniformity Coefficient	> 97
Curvature Coefficient	

Uniformity Coefficient and Coefficient of Curvature calculated in accordance with BS EN ISO 14688-2: 2004 + A1: 2013

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Signed:

Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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SUMMARY REPORT

Summary of Point Load Strength Index Tests Results

Tested in Accordance with: ISRM: 2007, pages 125-132

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB



Environmental Science

Client: TRC Companies Ltd
Client Address: 20 Red Lion Street, London, WC1R 4PQ

Client Reference: 413800
Job Number: 21-65451
Date Sampled: 17/02 - 24/02/2021
Date Received: 01/03/2021
Date Tested: 13/04/2021
Sampled By: Client

Contact: Martin Dorfling
Site Address: The Mole, Barry

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks # (including water content if measured)	Specimen Reference	Test Type see ISRM		Failure Valid (Y/N)	Dimensions				Force P kN	Equivalent diameter, De mm	Point Load Strength Index	
		Reference	Depth Top m	Depth Base m	Type				Type (D, A, I, B)	Direction (L, P or U)		Lne mm	W mm	Dps mm	Dps' mm			Is MPa	Is(50) MPa
1819077	CPBH01	Not Given	23.50	Not Given	B	Brown SANDSTONE	WC = 8.5%	1	I	U	YES	28.0	36.2	32.0	28.0	1.6	35.9	1.20	1.04
1819091	CPBH03	Not Given	23.00	Not Given	B	Grey SILTSTONE	WC = 0.5%	1	I	U	YES	55.3	101.3	68.0	48.0	22.1	78.7	3.56	4.37

Note: # non accredited; Test Type: D - Diametral, A - Axial, I - Irregular Lump, B - Block; Direction: L - parallel to planes of weakness, P - perpendicular to planes of weakness, U - unknown or random;
Dimensions: Dps - Distance between platens (platen separation), Dps' - at failure (see ISRM note 6), Lne - Length from platens to nearest free end W - Width of shortest dimension perpendicular to load, P;
Detailed legend for test and dimensions, based on ISRM, is shown above; Size factor, F = (De/50)0.45 for all tests

Comments:

Signed:



Monika Janoszek
PL Deputy Head of Geotechnical Section
for and on behalf of i2 Analytical Ltd

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Annex H: Budgetary Cost Estimates for Site Remediation & Enabling Works



EESI REMEDIATION
CONTAMINATION REPAIRED

THE MOLE, BARRY

**BUDGETARY COST ESTIMATES FOR SITE
REMEDiation & ENABLING**

For ABP DevCo

23 AUGUST 2021
U202115_005
DRAFT FOR COMMENT

Budgetary Cost Estimates for Site Remediation & Enabling issued for:
 ABP Development Company Ltd
 25 Bedford Street
 London
 WC2E 9ES

Document Information

Report Title	Budgetary Cost Analysis for Site Remediation & Enabling, The Mole, Barry	Budgetary Cost Analysis for Site Remediation & Enabling, The Mole, Barry	
Ref.	U2021015_005	U2021015_005	
Report Status	Draft for Comment	Version 1	
Date	23 rd August 2021	26 th August 2021	
Project No.	U2021015	U2021015	
Additional Comments			

Quality Control

Prepared by	TM/RP	TM	
Date	20 th August 2021	25 th August 2021	
Review by	RP	RP	
Date	20 th August 2021	26 th August 2021	
Approved by	RP	RP	
Date	23 rd August 2021	26 th August 2021	

TABLE OF CONTENTS

1	INTRODUCTION.....	2
1.1	AUTHORISATION	2
1.2	BACKGROUND INFORMATION	2
1.3	FOUNDATION OPTIONS	3
2	PROVISIONAL SCOPE OF WORKS.....	5
2.1	DESIGN & PERMITTING	5
2.2	ENABLING SPECIFICATION	6
2.3	GENERAL SCOPE OF WORKS	7
2.4	PROGRAMME	8
3	BUDGETARY COST ESTIMATES.....	9
3.1	CONCRETE RAFT FOUNDATION	10
3.2	CMC FOUNDATION	10

Appendices

APPENDIX A: Cost Tables

1 INTRODUCTION

1.1 Authorisation

EESI Remediation Limited (EESI) has been instructed by ABP Development Company Ltd (ABP DevCo) to provide budgetary cost estimates for different remediation and enabling strategies at The Mole, Neptune Road, Barry, CF26 5BR (hereafter referred to as the Site). The main objectives of the remediation and enabling activities are:

- To prepare a suitable working platform for the redevelopment of the site for a residential or mixed end-use;
- Ensure the integrity of the existing remediation cover layer; and
- To raise levels by an average 0.5 m for flood risk alleviation.

The budgetary cost models presented in this report reflect regional competitive market rates at the time of preparing this report. This report provided for illustrative purposes only.

1.2 Background Information

EESI have been provided with the following reports:

- **An interim report for ground investigation and site appraisal findings, produced by TRC Companies Limited (16th March 2021):** This report provides a peer review of historical reports and site information combined with contemporary data from a site investigation undertaken by TRC in January 2021. The report identifies a number of constraints relating to ground conditions and concludes with a recommendation for the use of Controlled Modulus Columns (CMC) to improve geotechnical ground conditions.
- **Raft Feasibility Report, The Mole, Barry, CF62 5BR, produced by Parmarbrook Limited (August 2021):** This report presents the findings of modelling work used to assess different foundation solutions, with focus on a reinforced concrete raft option. Structural assessment models for different building designs and associated foundation design parameters are presented, which conclude with the recommendation for use of a 500 mm thick reinforced concrete raft.
- **Raft Feasibility Assessment Revision 1, The Mole, Neptune Road, Barry, produced by Card Geotechnical Limited (August 2021):** This report was commissioned by Parmarbrook to complete a review of ground conditions in context of the recommended raft foundation solution.

Additional information has been provided to EESI from consultation with TRC, Parmarbrook and ABP DevCo to confirm the scope of works required to complete preparatory activities associated with the different foundation options.

In summary we understand the following:

- The site is a parcel of reclaimed land approximately 400 m long and 75 m wide, which extends into Barry Docks waterway.
- The Mole was constructed using locally won materials, which included both granular and cohesive material that were infilled at various thicknesses to level out the existing topography of the site;
- Underlying natural ground comprises Tidal Flat Deposits over a bedrock (Blue Anchor Formation and the Penarth Group);
- It is anticipated that a number of 'soft spots' will be present across the site due to the variations in quality of the capping layer and the use of both granular and cohesive material used to build up the original site;
- The site is generally grass or scrub covered with an area of hardstanding at the eastern end of the site where a single-story portacabin type building, steel shipping containers and jetty are located;
- An asphalt/compacted stone narrow access road runs along the northern boundary of the site;
- Ground level typically ranges between 8.5 and 8.8 mAOD with a raised bund (9.2 mAOD) running parallel with the access road and another soil mound (~ 11.5 mAOD) adjacent to the portacabins;
- Historical remediation has been completed across the site, which comprised the excavation and offsite disposal of contaminant soil hotspots and the installation of a site wide capping layer;
- 18no. tanks bases (ranging between 5 and 30 metre dia.) remain in-situ and typically comprise 300 mm thick slabs sat on either ring beam or raft foundations (estimated total area 5,730 m², total volume (including foundations) 2,200 m³);
- No significant contamination issues have been identified and no significant constraints relating to groundwater have been reported in the recent investigation findings;
- The recent site investigation reports that the remediation capping layer typically comprised a non-engineered fill over a geomembrane and Type 1 gravel layer (capillary break layer) of combined 0.6 to 0.8 m thickness; and
- A majority of the site needs to be raised an average 0.5 m for flood protection purposes (17,000 m³ of material import has been estimated).

It is understood that planning is in place for the redevelopment of the site to residential or mixed end-use, comprising the construction of 3 or 4 story apartment blocks or similar sized office units. A marina complex will also be built as part of the development scheme.

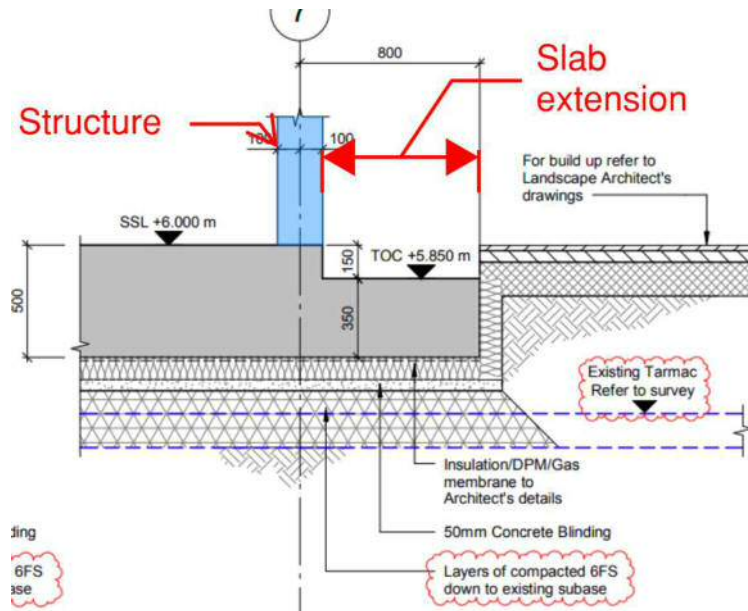
1.3 Foundation Options

Two foundations options have been put forward by TRC and Parmarbrook; Controlled Modulus Columns (CMC) and reinforced concrete raft foundations (concrete raft) respectively. Both options will require similar improvement of ground conditions, although the raft foundations can be constructed without the need to remove the concrete tank bases that remain in-situ.

A summary of the preparatory scope of works that will be required for both foundation options is provided in Section 2.2.

1.3.1 Concrete Raft Foundations

It is understood that the preferred raft solution will comprise a 500 mm thick reinforced concrete raft slab. Sub-base construction will comprise a compacted 200 mm layer of 6F5 aggregate beneath a 50 mm concrete binding layer and DPM/Gas membrane. No specific geotechnical criteria were put forward for land raising areas surrounding the building footprints. A construction schematic provided by Parmarbrook is enclosed overleaf.



1.3.2 CMC Foundation Solution

The CMC foundation solution will require the installation of 320 mm diameter pre-cast concrete modular block columns to a typical depth 21 m bgl. The CMC's would be installed on a 4 to 6.25 m² centres. A minimum 500 mm Load Distribution Platform will need to be installed within the CMC piling rig working areas; it is understood that this will need to be constructed from 6F2/6F5 aggregates.

In advance of installing the CMC, it will be necessary to remove the concrete tank bases with void spaces infilled with suitable granular fill. Geotechnical testing of conditions beneath the removed tank bases will also need to be completed to validate the CMC design; this will comprise CPT testing of cleared areas.

2 PROVISIONAL SCOPE OF WORKS

Our provisional scope of works has been primarily designed using information provided by Parmarbrook and TRC for the two different foundation options. However, consideration has also been given to the Site's extensive brownfield legacy and sensitive environmental setting. The design also considers waste minimisation through recovery and re-use of material generated during the enabling work and the use of secondary aggregates for import; noting that significant material import will be required to raise site levels for flood protection.

Based on these criteria we have considered and included cost allowances for the:

- design and permitting of the works,
- initial site preparatory works,
- reprofiling,
- material break-out, processing and recovery,
- reprofiling, backfilling and making good,
- construction of working layers and land raising; and
- geotechnical/geo-environmental verification testing.

Details relating to some of these activities are provided below, with additional information provided in Tables A1 to A3 in **Appendix A**.

2.1 Design & Permitting

The cost models include for the following design and permitting options, noting that regulatory consultation will be required to confirm what design and permitting documentation will be required.

- An **Earthworks Design** to provide site-specific details for material classification, methods of compaction and a geotechnical verification test regime for the chosen foundation solution. It is recognised that each foundation solution will require different levels of pre-commencement design input to validate and confirm modelled design parameters.
- A Detailed **Remediation Method Statement** that details a regulatory compliant strategy for the recovery and re-use of site won materials, use of imported material and methods for ensuring the integrity of the existing clean cover layer in the context of Land Condition Remediation Management guidelines. The RMS should also either incorporate or reference a **Construction Environmental Management Plan** that considers controls for managing potential environmental impacts e.g. run-off into the surrounding waterways.
- A **Material Management Plan (MMP)** that evidences the recovery and use of materials and soil excavated and processed on site in compliance with the Definition of Waste: Code of Practice. The MMP will also provide a framework for possible import of lower cost material from Donor sites, including waste materials that could be recovered through processing either on the site or at another facility within a Cluster arrangement defined within the MMP

- Subject to the extent of on-site treatment to recover and re-use site won waste, it may be necessary to deploy a **Mobile Plant Environmental Permit** for Remediation/Treatment of recovered waste material.
- Health and Safety management via a **Construction Phase Plan**, site specific Risk Assessments and Method Statements (RAMS) and control permits that consider risks such as working adjacent to waterways, traffic/person interfaces and COSHH.

2.2 Enabling Specification

Below is a summary of the key assumption used to develop a provisional scope of works for the enabling of the site. Additional, itemised, activities used to build up the cost models are provided in **Table A1** of **Appendix A**.

2.2.1 Concrete Raft Foundation

It is assumed that the total raft footprint will be 10,000 m² with an additional 5,000 m² of roadways, pavements, and car parking areas. We also assume that garden and green spaces will require a minimum of 300 mm of subsoil and topsoil for horticultural purposes (to be provided by others during the construction phase).

It is assumed that soft spot excavations will be limited to the top 0.5 to 1.5 metres of the site, covering of the raft footprint area 10,000 m². A total excavation volume of 8,000 m³ of soft material has been used in the budget cost models. In relation to material reuse and import requirements, the cost models also include for:

- Pre-commencement geotechnical characterisation and feasibility assessment, including the installation of additional Cable Percussion Boreholes, CPT's and groundwater monitoring.
- Re-use of stripped soils during grass/vegetation clearance, excavated soft spot soil and bund materials as subsoil/topsoil during the construction programme.
- Re-use of existing site material (bunds, high points, etc.) for reprofiling and levelling the site as a general fill;
- Re-use of existing capping material for backfilling excavated soft spot voids and the reinstatement of the capillary break layers (using comparable material).
- Reprofiling will lower the existing site level by 200 to 250 mm prior to placement of sub-base and raft foundation (some material may require import to build up level for flood protection).
- Import of 200 mm thick 6F5 subbase layers will be placed beneath raft foundation, roadways, pavements and carparks.
- Other areas will be brought up to the level of raft and roadway sub-base using clean, imported, cohesive materials (specification subject to local material availability) that comply with the specification provided in the CGL report (Section 5.1.5).

- Backfilling and compaction work associated with reprofiling, levelling and formation build-up will be completed in accordance to SHW Series 600 (Earthworks) methods.
- It is assumed that the 500 mm raft will bring site levels up to the required flood protection levels.
- A separate cost option that includes for the removal of the Tank Bases to be included (although it is understood that this is not required as part of this foundation solution option).

2.2.2 CMC Foundations

It is also understood that the CMC solution will require the removal of soft spots in advance of mobilising the piling rigs. The CMC will be placed beneath the footprint of the buildings with an additional 2 metre curtilage (10,000 m²). A 500 mm Load Distribution Platform will be constructed over the CMC area for piling rigs access.

Prior to mobilisation of piling plant, all concrete tank bases and foundations will be broken out and excavated. The total volume of concrete structures is estimated at 2,200 m³. At this stage it is assumed that all concrete bases will be removed. In relation to material reuse and import requirements, the cost models are based on the following:

- Re-use of stripping soils during grass/vegetation clearance, excavated soft spot soil and bund materials can be retained for use as subsoil/topsoil during the construction programme.
- Re-use of existing site material (bunds, high points, etc.) for reprofiling and levelling the site.
- All buried concrete tank bases and foundations will be excavated and removed.
- Re-use of recovered overburden from the tank removal and imported Type 2/3 aggregate fill for infilling excavated soft spot and tank base excavation voids.
- 500 mm 6F5/6F2 load distribution platform will be placed across building footprint area in advance of the CMC piling rigs being mobilised
- Recovered concrete will be crushed to create a suitable 6F5/6F2 aggregate for use in load distribution platform construction.
- Following CMC installations, the load distribution platform will be reduced to 300 mm with surrounding areas raised to 200 mm to form a raised formation level for future construction
- It is assumed that the construction of rafts, roadways and greenspaces will increase site levels >300 mm to meet flood protection.

2.3 General Scope of Works

Table 1 overleaf provides a summary of the site preparatory scope of work for each foundation design.

Table 1: General Scope of Works

Both Foundation Options	
<ol style="list-style-type: none"> 1. Complete pre-commencement design works and permitting; 2. Establish and set-up site welfare and secure site; 3. Establish environmental control and monitoring infrastructure; 4. Demolish and/or removed buildings, complete vegetative strip and undertake surface clearance; 5. Reprofile and level site, relocate surface bunds and break-out surface features; and, 6. Complete site wide 'proof rolling' to identify soft spots. 	
Concrete Raft Foundation	CMC Supported Foundations
<ol style="list-style-type: none"> 1. Complete supplementary site investigation and feasibility design 2. Excavate soft spots (assume 8,000 m³), backfill with site won compactable fill, making good to surface in accordance to Earthworks Design (reinstate existing capping layer and geomembrane); 3. Set-out building footprints, place and compact 200 mm sub-base layer (6F5); 4. Build-up surrounding levels using site won material or compactable fill to 200 mm above existing level; and, 5. Complete geotechnical testing. 	<ol style="list-style-type: none"> 1. Excavate soft spots (assuming 8,000 m³ in total), replace with site won aggregates; 2. Excavate overburden soil above tank bases at eastern end of site (33% of site, first third), locally stockpiling soil (segregating different material types); 3. Break-out and crush concrete tank bases and foundations to produce a 6F2/6F5 aggregate for use in the Load Distribution Platform; 4. Backfill and compact in accordance with Earthwork Design, reinstating the historical capping layer and raise area to final levels; 5. Complete geotechnical testing and validation; and, 6. Install 500 mm Load Distribution Platform. 7. Install CMC piles 8. Reprofile Load Distribution Platform to 300 mm and import additional fill to raise surrounding site levels by 200 mm.

Estimated quantities, where applicable, for the above scope of works are provided in **Tables A1 to A3** in **Appendix A**.

2.4 Programme

2.4.1 Reinforced Concrete Raft Foundations

The programme of site works is estimated at 16 weeks from the point of mobilisation.

The pre-commencement design work and permitting would require between 12 and 16 weeks, including the supplementary investigation work.

2.4.2 CMC Foundations

The programme of site works is estimated at 18 weeks from the point of mobilisation.

The pre-commencement design work and permitting would require between 8 and 12 weeks.

3 BUDGETARY COST ESTIMATES

Budgetary costs are enclosed in **Tables A2 to A3** in **Appendix A** for the following three scenarios:

- Remediation and enabling to support the installation of concrete raft foundations, leaving tanks bases in-situ;
- Option for removing tank bases as part of raft foundation solution; and,
- Remediation and enabling to support the installation of a CMC supported foundation.

The total budget cost estimate for each scenario is presented in Table 2 below.

Table 2: Remediation & Enabling Budget Total Cost for each Foundation Scenario

Scenario	Total Cost
Concrete Raft Foundation (leaving tank bases in-situ)	£593,640
Concrete Raft Foundation (additional cost option to remove concrete tank bases)	£80,415
CMC Foundation	£663,105

It should be noted that these costs are based on a series of assumptions and estimates that will require further detailed assessment. We would highlight the following:

- The extent and depth of soft spot soil excavation will need further evaluation to confirm the excavation depths to mitigate these risks;
- No allowances have been made for the installation of clean service/utility corridors;
- The programme of works will be sensitive to the quantity of material that can be sourced and imported onto site; and
- Material import costs appear to be driven by regional supply and demand, costs are currently based on General Fill (compactable material) Rates of £6/tonne and 6F5 rates of £7.15/tonne (cost include site delivery).

To confirm, specific to the concrete raft foundation solution, no costs have been included for the construction of the raft foundations or any materials required to finish roadways, pavements, or build up topsoil/subsoil layers for green spaces.

With regards to the CMC foundation solution, the enclosed cost estimates do not include for the installation of the CMC's or import of any materials to construction foundations, slabs, roadways/pavements or green spaces.

3.1 Concrete Raft Foundation

In relation to remediation and enabling costs, the raft foundation offers to most cost-effective solution. This is principally driven by a reduced material import requirement as it is assumed the 500 mm thick raft slab will meet the required 0.5 m increase in elevation for flood protection. In addition, this solution can be completed without need to remove the concrete tanks bases; separate analysis of these costs indicates a potential saving of £80,415.

3.2 CMC Foundation

This option is more expensive due to the requirement to install a 500 mm thick Load Distribution Platform (although these costs are offset by reducing the platform to 300 mm thickness post CMC installation and using the surplus to built-up surrounding levels) and break-out the concrete tank bases, which also increases the works programme by an estimated 2 weeks.

3.3 Opportunities for Cost Savings

The provisional scope of works has been designed to produce reasonable case cost estimates for the preparation of the site for construction. In doing so, EESI has identified additional recommendations and opportunities that may lead to significant cost savings. These include:

Detailed Material Balance: Completing a more detailed analysis of material import requirements that includes analysis of the suitability of existing banded material or site won soft material for re-use within the overall scheme should help further refine the overall material import requirements.

Geosynthetics: The use of geosynthetic strengthen products (e.g. geogrids) to maximise the re-use potential of less geotechnical suitable materials and/or reduce the extent of soft spot excavations.

MMP Cluster Arrangement: Options for importing materials, including the recovery of waste materials, from other donor sites could also be considered within a MMP Cluster arrangement. EESI can provide options for screening, sorting and structurally improving materials for use as a geotechnically competent general fill. For the Mole, this would probably be limited to the infilling of deeper soft spot voids or tank base excavations at depth, noting that these voids will have a capacity of 6,000 to 10,000 m³. The typical cost for treating material to make them suitable for re-use will be dependent on the material being brought onto site; £2.5/tonne for material that require simple sorting and screening through to £10/tonne for material that requires pre-treatment, screening, and stabilisation.

Reduce Tank Base Removal Programme (CMC option only): It is currently assumed that all concrete tank bases will be removed. It is possible that some tanks could remain in-situ or only partially removed. A 50% reduction in the scope of these works could reduce the cost of this option by circa £40,000.

APPENDIX A: COST TABLES

APPENDIX A (Version 1.1)

Table A 1 Cost Model Details

Action	Concrete Raft Foundation	CMC Foundation
Included within cost model	<ol style="list-style-type: none"> 1. Prepare Construction Phase Plan, Construction Environmental Management Plan, MMP (QP Sign-off by others), RAMS, Traffic Management Plan, Works Sequence, Control Permits and Waste Register. Earthworks and Foundation Design Specification by others. 2. Prepare and deploy Environmental Permit for Remediation (subject to treatment of any materials), establish crushing permit and discharge to sewer permit (if available) 3. Set-up a bunds at boundary to control run-off (excludes use of geotextile membranes or pumping equipment) 4. Establish haul routes using existing roadways, including allowance for road sweepers and wheel wash (at site entrance) 5. Fence off entrance to site and establish fencing around excavation and works areas 6. Set-up boundary monitoring stations for dust and noise (vibration monitoring to be completed by others) 7. Establish Welfare (Site Office, Canteen/Meeting Room, Storage Units, Refuelling Area, Laydown Area, CCTV Security and Carparking) 8. Construct bunded area for crushing and material processing 9. Vegetation Strip, clearance of surface waste, building demolition and removal of redundant shipping containers 10. Utility surveys, isolation of surveys and clearance/setting of easements 11. Proof rolling, soft spot excavation and haulage to stockpile area 12. Reinstate capping layer following backfill and compaction methodology prescribed in earthwork and foundation design specification. 13. Placement and roll compaction of suitable imported aggregates in accordance to Earthworks/Foundation Design specifications to complete installation of 200 mm sub-base beneath buildings, roads and hardstanding areas and 200 mm general fill area in green spaces. 14. Deployment of full-time site team comprising Site Manager, Site Engineer, Foreman and part-time Labourer and Gate Man (to manage plant, undertake regular topographical surveys, collect samples, track material movements and oversee environmental compliance monitoring) 15. Project Management (including allowance for Project Director involvement) 16. Geo-environmental and Geotechnical Field and Laboratory Testing 17. Completion Reporting (preparation of factual completion report) 18. Allowanced for programme management, weekly operational reporting, regular project meetings, regulatory and stakeholder engagement. <p>Assumed works programme 16 weeks.</p>	<ol style="list-style-type: none"> 1. Prepare Construction Phase Plan, Construction Environmental Management Plan, MMP (QP Sign-off by others), RAMS, Traffic Management Plan, Works Sequence, Control Permits and Waste Register. Earthworks and Foundation Design Specification by others. 2. Prepare and deploy Environmental Permit for Remediation (subject to treatment of any materials), establish crushing permit and discharge to sewer permit (if available) 3. Set-up a bunds at boundary to control run-off (excludes use of geotextile membranes or pumping equipment) 4. Establish haul routes using existing roadways, including allowance for road sweepers and wheel wash (at site entrance) 5. Fence off entrance to site and establish fencing around excavation and works areas 6. Set-up boundary monitoring stations for dust and noise (vibration monitoring to be completed by others) 7. Establish Welfare (Site Office, Canteen/Meeting Room, Storage Units, Refuelling Area, Laydown Area, CCTV Security and Carparking) 8. Construct bunded area for crushing and material processing 9. Vegetation Strip, clearance of surface waste, building demolition and removal of redundant shipping containers 10. Utility surveys, isolation of surveys and clearance/setting of easements 11. Excavation, haulage, and temporary stockpile of overburden soil (assume all tanks remain in-situ, area cleared based on all tank areas + 20% for battering excavation faces) 12. Proof rolling, soft spot excavation and haulage to stockpile area 13. Break-out, excavation and haulage of concrete pads, ring foundations and raft foundations associated with former tank bases 14. Crushing and processing of concrete to produce suitable aggregate end product. 15. Reinstatement of engineer capping layer (where removed) and reprofiling existing fill (including existing bunds and stockpiles) that will remain in-situ to support backfilling of site won/imported fill. 16. Placement and roll compaction of site won materials in accordance to Earthwork Design specification within former tank base excavations 17. Site reprofiling and levelling using site won material 18. Placement and roll compaction of suitable imported aggregates to Earthwork Design specification to form 500 mm Load Distribution Platform 19. Reprofiling of Load Distribution Platform and site level raise (post CMC installation) 20. Deployment of full-time site team comprising Site Manager, Site Engineer, Foreman and part-time Labourer and Gate Man (to manage plant, undertake regular topographical surveys, collect samples, track material movements and oversee environmental compliance monitoring) 21. Project Management (including allowance for Project Director involvement) 22. Geo-environmental and Geotechnical Field and Laboratory Testing 23. Completion Reporting (preparation of factual completion report) 24. Allowanced for programme management, weekly operational reporting, regular project meetings, regulatory and stakeholder engagement.

		Assumed works programme 18 weeks.
Excluded from cost model (and design assumptions)	<p><u>Exclusions</u></p> <ol style="list-style-type: none"> 1. Provision of generators and fuel (we assume power connections for welfare will be available) 2. Water supply, sewer disposal or offsite disposal charges for wastewater 3. Fencing off full site perimeter (approximately 1,000 m) 4. Assessment of 'waste' material sourced from another third party or preparation of associated Cluster arrangement 5. Preparation of Outline Remediation Strategy and associated Regulatory Liaison 6. Preparation of Earthwork and/or Foundation Design 7. Construction or renovation of revetments, retaining walls or other structures 8. Any temporary works 9. Costs for operating during winter months (October to March) e.g. surface water management, reduced daylight working hours, impact of weather, etc. 10. Ecological management 11. Any construction work, including raft foundations, surface features, utilities, services, roadways, pavements, etc. 12. Material Management Costs during subsequent Construction Phase. 13. Any offsite disposal 14. Management of any encountered contamination, including asbestos containing materials <p><u>Design Assumptions</u></p> <ol style="list-style-type: none"> 15. A Principal Designer will be appointed by the client 16. Suitable easements will be placed around the perimeter of the site boundaries that adjacent to water 17. No contamination requiring treatment, management or use of control measures will be encountered during excavations 18. No asbestos impacted materials will be encountered e.g. no control measures specific to asbestos management (licensed or non-licensed) will be required 19. Any historical foundation structures that are not associated with the 18no. tanks bases can be retained in the ground 20. All tank slabs and foundation have no or standard levels of steel reinforcement 21. All site won material will be retained on site, included segregated fines/cohesive material 22. The finish platform will comprise a single level graded down to existing level 3 metres from edge of site 23. The edges of the raised areas will comprise a 1 in 3 battered gradients to existing ground level 24. Any recovered green waste can be stockpiled and composted on site for future use in garden spaces 	

TABLE A2.1 Concrete Raft Foundation, Remediation & Enabling Budget Cost Estimates

Item	Activity	Cost	
1	Pre-commencement, Design and Procurement	£10,725	
	Supplementary Site Investigation and Geotechnical Feasibility Testing	£48,000	Cable Percussion Drilling, CPT, GW Monitoring and Analysis
2	Site Set-up and Mobilisation	£14,750	
3	Demolition and Site Clearance	£8,250	
4	Preliminary Costs	£78,500	Based on CDM requirements as Principal Contractor
5	Site Attendance and Project Management	£148,600	16 week programme
6	Proof Rolling and soft spot excavation	£36,175	Soft spot materials retained on site for use during construction phase
8	Stockpile Management	£15,730	
14	Material Import	£98,610	Based on 5,400 tonnes of secondary 6F5 for building and road sub-base construction and 10,000 tonnes of cohesive, granular, general fill for building up remaining cover areas and part infilling soft spots Sub-soil and Top-soil (8,000 tonnes est.) and pavement construction materials are not included in this line item (NB. materials required to meet flood alleviation land raise)
11	Reprofiling, Backfilling and Compaction	£66,300	Includes for placement of geomembrane fabrics between granular and cohesive layers
15	Verification Testing (Lab and Field Testing)	£51,445	Includes for additional CPT and in-situ testing of infilled soft spot areas and sub-base platform
13	Finishing	£8,075	
17	Demobilisation	£6,380	
18	Validation Reporting	£2,100	
	TOTAL	£593,640	

TABLE A2.2 (Removal of Concrete Slabs Option, running concurrent to other site enabling works)

Item	Activity	Cost	
4	Preliminary Costs	£9,800	
5	Site Attendance and Project Management	£18,575	
6	Excavation of Slab Overburden	£16,950	
8	Break-out and Processing Slabs and Foundations	£39,690	
14	Material Import	(£4,600)	Saving accrued from site won 6F5
	TOTAL	£80,415	

Table A3 CMC Foundation, Remediation & Enabling Budget Cost Estimates

Item	Activity	Cost	Comments
1	Pre-commencement, Design and Procurement	£10,725	
2	Site Set-up and Mobilisation	£14,150	
3	Demolition and Site Clearance	£8,250	
4	Preliminary Costs	£88,300	Based on CDM requirements as Principal Contractor
5	Site Attendance and Project Management	£167,175	Based on an 18 week programme
6	Proof Rolling and soft spot excavation	£36,175	Soft spot materials retained on site for use during construction phase
6	Excavation of slab Overburden	£16,950	
8	Break-out and Processing Slabs and Foundations	£39,690	
7	Stockpile Management	£23,600	
11	Material Import (Provisional Sum)	£114,750	Based on 9,000 tonnes of secondary 6F2/6F5 import to construct 500 mm load distribution platform and 8,400 tonnes of cohesive, granular, general fill for building up remaining cover areas and part infilling soft spots. Sub-soil and Top-soil (8,000 tonnes est.) and pavement construction materials are not included in this line item.
9	Reprofiling, Backfilling and Compaction	£90,300	Includes for placement of geomembrane fabrics between granular and cohesive layers
12	Verification Testing (Lab and Field Testing)	£35,620	Includes for CPT testing beneath for tank bases
10	Finishing	£8,075	
13	Demobilisation	£7,245	
14	Validation Reporting	£2,100	
	TOTAL	£663,105	