

APPENDIX C

BOREHOLE AND TRIAL PIT LOCATION PLAN AND LOGS



KEY

-  Trial Pit Location
-  (PT) Percolation Test Location
-  Windowless Sampling Borehole Location



0m 50m
Approximate Scale



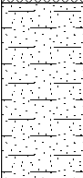
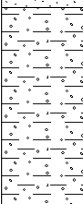
ARP GEOTECHNICAL LTD
CHARTERED CONSULTING ENGINEERS
Northwest House • 5-6 Northwest Business Park • Servia Hill • Leeds LS6 2QH
Telephone : 0113 245 8498 • Fax : 0113 244 3864 • E-Mail : leeds@arpassociates.co.uk

Project	
LAND AT CATHERINE'S WALK BARNSELEY	
Client	
LEEDS AND YORKSHIRE HOUSING ASSOCIATION	
Title	
SITE INVESTIGATION PLAN	
Date	
NOVEMBER 2017	
Drawn	Scale
@ A3	AS SHOWN
Job No.	
LYH/01	

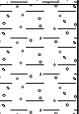
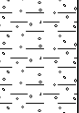
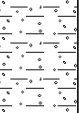
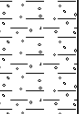
 ARP Geotechnical Limited				Trial Pit Log			TrialPit No TP1 Sheet 1 of 1		
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: - Level:		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Pit Dimensions (m): Length: 2.20 m Width: 0.70 m Depth: 3.40 m		Scale 1:25 Logged: EGH	
Client: Leeds and Yorkshire Housing Association									
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
Depth	Type	Results							
0.05 - 0.10	ES		0.05 0.10			MADE GROUND: Concrete flags over orangish brown fine to coarse SAND. MADE GROUND: Dark brown and grey fine to coarse angular GRAVEL of sandstone and clinker. High strength (stiff) orangish brown and mottled grey CLAY. (Glacial Till).			
0.30		HSV=126							
0.90 - 1.00 0.90	D	HSV=140	1.20			High strength (stiff) dark grey gravelly CLAY. Gravel is angular to rounded, of mixed lithologies, with trace coal. Low subrounded cobble content, of sandstone. (Glacial Till).			
2.40 - 2.50	D								
			3.40 3.40			Terminated in hard to dig strata End of Pit at 3.400m			
Groundwater: No groundwater entries recorded.									
Backfill: Backfilled filled with arisings, following the completion of percolation testing.									
Stability: Pit sides generally remained stable for the short period of exposure.									
Remarks:									
RrTP_v1.052									

Date
19/10/2017

Logged:
EGH

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
Depth	Type	Results					
0.00 - 0.30	ES		0.30			MADE GROUND: Dark greyish brown slightly clayey slightly sandy gravelly TOPSOIL. Gravel is angular, of sandstone. Trace glass.	1
						Orangish brown clayey fine to coarse SAND. (Completely Weathered Sandstone).	
						Stiff dark brown and greyish brown slightly gravelly CLAY. Gravel is subangular, of sandstone. (Completely Weathered Sandstone).	
1.20 - 1.40	D					Extremely weak, thinly bedded (up to 40mm), yellowish brown, fine to coarse grained SANDSTONE. Recovered as sandy angular gravel and cobbles. (Woolley Edge Rock).	
						Terminated in hard to dig strata	
			1.60			End of Pit at 1.700m	2
			1.70				
			1.70				
							3
							4
							5

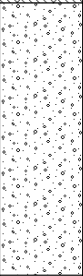
RrTP v1.052

 ARP Geotechnical Limited				Trial Pit Log			TrialPit No TP3 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: - Level:		Date 19/10/2017
Location: Catherine's Walk, Barnsley						Pit Dimensions (m): Length: 2.50 m Width: 0.60 m Depth: 4.00 m		Scale 1:25 Logged: EGH
Client: Leeds and Yorkshire Housing Association								
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
Depth	Type	Results						
0.00 - 0.30	ES					Turf over dark greyish brown slightly clayey slightly gravelly TOPSOIL. Gravel is subangular to subrounded, of mixed lithologies.		
0.40		HSV=70	0.40			Medium strength (firm) orangish brown and mottled grey sandy CLAY. (Glacial Till).		
0.90 - 1.00	D		0.90			Very high strength (very stiff) greyish brown and orangish brown slightly gravelly CLAY. Gravel is subangular to rounded, of mixed lithologies. (Glacial Till).		
1.40		HSV=140						
			3.00					
			4.00					
			4.00					
						Terminated in hard to dig strata End of Pit at 4.000m		
Groundwater: No groundwater entries recorded.								
Backfill: Backfilled with arisings, following the completion of percolation testing.								
Stability: Pit sides generally remained stable for the short period of exposure.								
Remarks:								

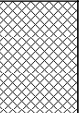
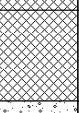
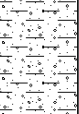
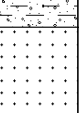
Date
19/10/2017

Scale
1:25

Logged:
FGH

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.30	ES		0.30			Dark greyish brown slightly clayey slightly gravelly TOPSOIL. Gravel is subangular to rounded, of mixed lithologies.
1.00 - 1.20	D					Orangish brown sandy fine to coarse GRAVEL of sandstone. High angular cobble content, of sandstone. (Completely Weathered Sandstone).
						Extremely weak, thickly laminated to thinly bedded (up to 60mm), yellowish brown, fine to coarse grained SANDSTONE. Recovered as sandy angular gravel and cobbles. (Woolley Edge Rock).
			1.20 1.30 1.30		Terminated in hard to dig strata End of Pit at 1.300m	

Remarks:

 ARP Geotechnical Limited				Trial Pit Log			TrialPit No TP5 Sheet 1 of 1		
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: - Level:		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Pit Dimensions (m): Length: m Width: m Depth: 1.60 m		Scale 1:25 Logged: EGH	
Client: Leeds and Yorkshire Housing Association									
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
Depth	Type	Results							
0.00 - 0.30	ES	HSV=90				MADE GROUND: Dark greyish brown slightly clayey slightly sandy slightly gravelly TOPSOIL. Gravel is subangular, of sandstone, with trace plastic and glass.			1
0.40 - 0.70	ES		0.40			POSSIBLE MADE GROUND: Dark grey and dark brown slightly sandy gravelly CLAY. Gravel is subangular to rounded, of mixed lithologies, with trace coal. (Reworked).			
0.90 - 1.00	D		0.70			High strength (stiff) orangish brown and mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular, of sandstone. (Completely Weathered Sandstone).			
0.90			1.20			Extremely weak, very thinly to thinly bedded (up to 40mm), yellowish brown, fine to coarse grained SANDSTONE. Recovered as sandy angular gravel. (Woolley Edge Rock).			
			1.60 1.60		Terminated in hard to dig strata End of Pit at 1.600m				
2 3 4 5									
Groundwater: No groundwater entries recorded. Backfill: Backfilled with arisings on completion. Stability: Pit sides generally remained stable for the short period of exposure. Remarks:									

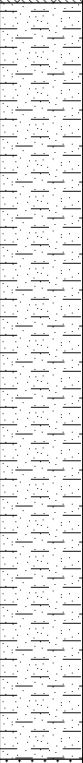
 ARP Geotechnical Limited				Trial Pit Log			TrialPit No TP6 Sheet 1 of 1		
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: - Level:		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Pit Dimensions (m): Length: m Width: m Depth: 2.00 m		Scale 1:25 Logged: EGH	
Client: Leeds and Yorkshire Housing Association									
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
Depth	Type	Results							
0.00 - 0.20	ES	HSV=130	0.20			Dark greyish brown slightly clayey slightly sandy slightly gravelly TOPSOIL. Gravel is subangular, of sandstone.			
0.90						Firm greyish brown and orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded, of mixed lithologies. Low subangular cobble content, of sandstone. Low subrounded boulder content (up to 210mm), of sandstone. (Glacial Till).			
1.80 - 1.90						D	1.80 1.90 2.00 2.00		Dark greyish brown CLAY. (Glacial Till)
	Extremely weak, thinly bedded (up to 40mm), yellowish brown, fine to coarse grained SANDSTONE. Recovered as angular sandy gravel. (Woolley Edge Rock).								
	Terminated in hard to dig strata								
	End of Pit at 2.000m								
Groundwater: No groundwater entries recorded. Backfill: Backfilled with arisings on completion. Stability: Pit sides generally remained stable for the short period of exposure. Remarks:									

RrTP_v1.052

Date
19/10/2017

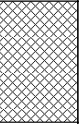
Scale
1:25

Logged:
EGH

Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth	Type	Results				
0.00 - 0.30	ES	HSV=76	0.30			Dark greyish brown slightly clayey slightly sandy TOPSOIL.
0.90	D					Firm orangish brown and mottled grey slightly sandy CLAY. Low rounded boulder content, of sandstone. (Glacial Till) From 1.9m: High strength (stiff)
1.00 - 1.20						
1.20		HSV=111				
			2.80			Extremely weak, thinly bedded (up to 40mm), yellowish brown, fine to coarse grained SANDSTONE. Recovered as sandy angular gravel. (Woolley Edge Rock).
			2.90			Terminated in hard to dig strata
			2.90			End of Pit at 2.900m

Remarks:

 ARP Geotechnical Limited				Trial Pit Log			TrialPit No TP8 Sheet 1 of 1		
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: - Level:		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Pit Dimensions (m): Length: m Width: m Depth: 2.90 m		Scale 1:25 Logged: EGH	
Client: Leeds and Yorkshire Housing Association									
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
Depth	Type	Results							
0.30 - 0.50	ES		0.30			MADE GROUND: Turf over dark greyish brown slightly clayey slightly gravelly TOPSOIL. Gravel is subangular, of sandstone, with occasional plastic and glass.			
			1.00			MADE GROUND: Dark greyish brown slightly clayey gravelly organic fine to coarse SAND. Gravel is subangular to rounded, of sandstone and mixed lithologies, with occasional ceramic. Trace coal and glass.			
			2.80			Firm orangish brown and mottled grey sandy slightly gravelly CLAY. Gravel is subangular, of sandstone. Medium subangular cobbles, of sandstone. (Glacial Till).			
			2.90						
			2.90			Extremely weak, very thinly to medium bedded (up to 80mm), light yellowish brown, fine to coarse grained SANDSTONE. Recovered as sandy angular gravel and oobbles. (Woolley Edge Rock).			
						Terminated in hard to dig strata End of Pit at 2.900m			
Groundwater: No groundwater entries recorded. Backfill: Backfilled with arisings on completion. Stability: Slight instability noted from the surface to 1m depth, associated with the made ground. Remarks:									

 ARP Geotechnical Limited				Trial Pit Log			TrialPit No TP9 Sheet 1 of 1		
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: - Level:		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Pit Dimensions (m): Length: m Width: m Depth: 1.40 m		Scale 1:25 Logged: EGH	
Client: Leeds and Yorkshire Housing Association									
Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
Depth	Type	Results							
0.10 - 0.40	ES	HSV=130	0.40			MADE GROUND: Concrete flags over dark grey sandy fine to coarse angular to rounded GRAVEL of sandstone, clinker and ash. Medium angular cobble content, of brick.			
1.00 - 1.20	D		1.40			High strength (stiff) orangish brown CLAY. (Glacial Till).			
1.00			1.40			Terminated in at least high strength (stiff) natural clay. End of Pit at 1.400m			
Groundwater: No groundwater entries recorded. Backfill: Backfilled with arisings on completion. Stability: Slight instability from the surface to 0.4m depth. Remarks: RrTP_v1.052									

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS02 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association						Rig Crew: RP Drilling Ltd		Logged: HMM	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.00 - 0.20	D		0.20			Turf over dark brown slightly clayey slightly sandy TOPSOIL.	
					0.40			Firm orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular, of sandstone. (Completely weathered sandstone).	
		0.90	SPT	50 (20,5/50 for 75mm)	0.80			Stiff orangish brown mottled grey sandy very gravelly CLAY. Gravel is angular, of sandstone. (Completely weathered sandstone).	1
					1.03			Extremely weak, thickly laminated to thinly bedded (up to 60mm), yellowish brown, fine to coarse grained SANDSTONE. Recovered as sandy angular gravel and cobbles. (Woolley Edge Rock). SPT refusal.	
								End of Borehole at 1.030m	2
									3
									4
									5
									6
									7
									8
Groundwater: Strata appeared dry. Backfill: Backfilled with arisings on completion. Remarks:									



Windowless Sample Log

Borehole No.

WS03

Sheet 1 of 1

Project Name: Land at Catherine's Walk

Project No.
LYH/01

Co-ords: -

Date
19/10/2017

Location: Catherine's Walk, Barnsley

Level:

Scale
1:40

Client: Leeds and Yorkshire Housing Association

Rig Crew: RP Drilling Ltd

Logged:
HMM

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	D		0.30 0.50			Turf over dark greyish brown slightly sandy slightly gravelly TOPSOIL. Gravel is angular to subangular, of sandstone and mixed lithologies.	
		1.00	SPT	N=14 (2,2/2,3,4,5)	1.00			Firm orangish brown sandy very gravelly CLAY. Gravel is angular to subangular, of sandstone. (Glacial Till).	1
					1.70			Firm orangish brown mottled dark grey slightly gravelly CLAY. Gravel is subangular, of sandstone. (Glacial Till).	
		2.00	SPT	N=50 (2,3/50 for 295mm)	2.00			Medium strength (firm) dark orangish brown slightly gravelly CLAY. Gravel is angular, of sandstone, with trace coal. (Glacial Till).	
					2.45			Stiff orangish brown mottled grey slightly gravelly CLAY. Gravel is angular, of sandstone. (Glacial Till).	2
					2.45			Cone SPT. No recovery.	
								SPT refusal on probable bedrock (sandstone).	3
								End of Borehole at 2.450m	4
									5
									6
									7
									8

Groundwater: Strata appeared dry.

Backfill: Backfilled with arisings on completion.

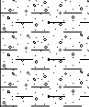
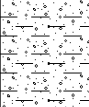
Remarks:

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS04 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association						Rig Crew: RP Drilling Ltd		Logged: HMM	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	D		0.30		Turf over dark greyish brown slightly gravelly TOPSOIL. Gravel is subangular, of mixed lithologies.		
		0.90 - 1.10	D		0.80		Firm orangish brown and dark grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, of sandstone. (Glacial Till).		
		1.00	SPT	N=11 (2,2/2,2,3,4)			Medium strength (firm) orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular, of sandstone. (Glacial Till).	1	
		2.00	SPT	N=10 (2,2/2,2,3,3)	2.00		Medium strength (firm) dark brown slightly sandy slightly gravelly CLAY. Gravel is angular, of sandstone. (Glacial Till).	2	
		3.00	SPT	N=22 (3,3/4,4,6,8)			From 3m: High strength (stiff).	3	
		3.60	SPT	50 (25 for 10mm/50 for 10mm)	3.60 3.62 3.62		Very high strength very stiff light orange brown very gravelly SAND. Gravel is coarse angular of sandstone. [Completely weathered sandstone]. Cone SPT. No recovery. SPT refusal on probable bedrock (sandstone). End of Borehole at 3.620m	4	
								5	
								6	
								7	
								8	

Groundwater: Strata appeared dry.
 Backfill: Backfilled with arisings on completion.
 Remarks:

RrWS_v1.054

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS05 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association						Rig Crew: RP Drilling Ltd		Logged: HMM	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	D		0.30		 Turf over dark greyish brown slightly gravelly TOPSOIL. Gravel is subangular, of mixed lithologies.		
		1.00	SPT	N=9 (2,2/2,2,2,3)			 Firm orangish mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, of sandstone. (Glacial Till).		1
		1.30 - 1.50	D		1.50		<i>From 1m: Medium strength (firm).</i>		
		2.00	SPT	N=12 (2,2/3,3,3,3)			 Medium strength (firm) light orangish brown slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, of sandstone. (Glacial Till).		2
		3.00	SPT	50 (2,3/50 for 30mm)	3.00		 Cone SPT. No recovery.		3
					3.18		 SPT refusal on probable bedrock (sandstone).		
					3.18		End of Borehole at 3.180m		
Groundwater: Strata appeared dry. Backfill: Backfilled with arisings on completion. Remarks:									

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS06 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association						Rig Crew: RP Drilling Ltd		Logged: HMM	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	D		0.30			Turf over greyish brown slightly gravelly TOPSOIL. Gravel is fine to coarse subangular, of mixed lithologies.	
		1.00 - 1.20 1.00	D SPT	N=10 (2,2/2,2,3,3)	1.20			Firm orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, of sandstone. (Glacial Till).	1
					1.70			<i>From 1m: Medium strength (firm).</i>	
					2.00			Medium strength (firm) orangish brown slightly clayey very gravelly SAND. Gravel is angular and subangular, of sandstone. (Glacial Till).	
		2.00	SPT	N=50 (3,3/50 for 295mm)	2.00			Very high strength (very stiff) orangish brown and grey slightly sandy very gravelly CLAY. Gravel is angular, of sandstone. (Glacial Till).	2
					2.45			Cone SPT. No recovery.	
					2.45			SPT refusal on probable bedrock (sandstone). End of Borehole at 2.445m	
									3
									4
									5
									6
									7
									8
Groundwater: Strata appeared dry. Backfill: Backfilled with arisings on completion. Remarks:									



Windowless Sample Log

Borehole No.

WS07

Sheet 1 of 1

Project Name: Land at Catherine's Walk

Project No.
LYH/01

Co-ords: -

Date
19/10/2017

Location: Catherine's Walk, Barnsley

Level:

Scale
1:40

Client: Leeds and Yorkshire Housing Association

Rig Crew: RP Drilling Ltd

Logged:
HMM

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.40	D		0.45			Turf over dark greyish brown slightly sandy gravelly TOPSOIL. Gravel is subangular, of mixed lithologies.	
		1.00	SPT	N=8 (3,2/2,2,2,2)				Firm orangish brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is angular to subangular, of sandstone. (Glacial Till).	1
		1.20 - 1.40	D					<u>From 1m: Medium strength (firm).</u>	
		2.00	SPT	N=10 (2,2/2,2,3,3)	2.60			Medium dense orangish brown slightly clayey very gravelly SAND. Gravel is angular, of sandstone. (Completely Weathered Sandstone).	2
		3.00	SPT	N=31 (5,7/9,8,7,7)				<u>From 3m: Dense.</u>	3
		3.60	SPT	30 (25 for 95mm/30,,,))	3.60 3.65 3.65			Cone SPT. No recovery. SPT refusal probable bedrock (sandstone) End of Borehole at 3.650m	4
									5
									6
									7
									8

Groundwater: Strata appeared dry.

Backfill: Backfilled with arsing on completion.

Remarks:

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS08 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association						Rig Crew: RP Drilling Ltd		Logged: HMM	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	D		0.30			Turf over greyish brown slightly sandy slightly gravelly TOPSOIL. Gravel is subangular, of mixed lithologies.	
		0.50 - 0.70	D		0.70			Firm orangish brown slightly sandy gravelly CLAY. Gravel is subangular, of sandstone. (Completely weathered sandstone).	
		1.00	SPT	N=17 (2,2/4,3,5,5)				High strength (stiff) orangish brown mottled grey slightly sandy gravelly CLAY. Gravel is angular, of sandstone. (Completely weathered sandstone).	1
		1.60	SPT	50 (25 for 60mm/50 for 40mm)	1.50 1.60 1.70 1.70			Dense? orangish brown slightly clayey sandy fine to coarse angular GRAVEL of sandstone. (Completely Weathered Sandstone).	
							RECOVERY	Cone SPT. No recovery.	2
								SPT refusal on probable bedrock (sandstone). End of Borehole at 1.700m	
									3
									4
									5
									6
									7
									8
Groundwater: Strata appeared dry. Backfill: Backfilled with arisings on completion. Remarks:									

 ARP Geotechnical Limited					Windowless Sample Log			Borehole No. WS10 Sheet 1 of 1		
Project Name: Land at Catherine's Walk					Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley							Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association							Rig Crew:		Logged: EGH	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	ES		0.05 0.10 0.30 0.50		MADE GROUND: Concrete flags.		
		1.00	SPT	N=10 (2,2/2,2,3,3)	0.95		MADE GROUND: :Light brown gravelly fine to coarse SAND. Gravel is subangular to rounded, of sandstone and limestone.		
		1.60 - 1.80	D				MADE GROUND: Greyish brown and very dark grey, sandy fine to coarse angular and subrounded GRAVEL of sandstone, ash and clinker.	1	
		2.00	SPT	N=12 (2,2/2,3,3,4)			MADE GROUND: Reddish brown angular and subangular gravelly COBBLES of brick. Gravel is angular, of brick.		
							Orangish brown and mottled grey CLAY. (Glacial Till).		
							Medium strength (firm) dark grey and greyish brown slightly sandy CLAY. (Glacial Till).		
							From 0.95m to 2m depth: Occasional tree roots.	2	
							From 1.85m: Slightly gravelly, with angular to rounded gravel of mixed lithologies.		
		3.00	SPT	N=26 (4,4/5,6,7,8)					
							From 3m: Very high strength (very stiff).	3	
		4.00	SPT	N=50 (5,7/50 for 285mm)					
					4.44 4.44				
							SPT refusal.	4	
							End of Borehole at 4.435m	5	
								6	
								7	
								8	

Groundwater: Strata appeared dry.
 Backfill: Backfilled with arisings on completion.
 Remarks:

RrWS_v1.054

 ARP Geotechnical Limited				Windowless Sample Log				Borehole No. WS11 Sheet 1 of 1	
Project Name: Land at Catherine's Walk				Project No. LYH/01		Co-ords: -		Date 19/10/2017	
Location: Catherine's Walk, Barnsley						Level:		Scale 1:40	
Client: Leeds and Yorkshire Housing Association						Rig Crew:		Logged: EGH	
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.30	ES		0.40		 MADE GROUND: Dark greyish brown slightly sandy TOPSOIL. High angular cobble content, of sandstone and brick. Orangish brown CLAY. (Glacial Till).		
		1.00	SPT	N=20 (3,3/4,4,6,6)	0.95				
		1.60 - 1.80	D				 High strength (stiff) grey and greyish brown, slightly gravelly CLAY. Gravel is subangular to rounded, of sandstone and mixed lithologies. Trace coal. (Glacial Till).	1	
		2.00	SPT	N=20 (6,4/4,5,5,6)				2	
		3.00	SPT	N=26 (4,4/5,6,7,8)				3	
		4.00	SPT	N=50 (7,9/50 for 245mm)	4.40 4.40			4	
							From 4m: <i>Extremely high strength (hard)</i> . SPT refusal. End of Borehole at 4.395m	5	
								6	
								7	
								8	
Groundwater: Strata appeared dry. Backfill: Backfilled wit arisings on completion. Remarks:									

APPENDIX D

PERCOLATION TEST RESULTS

[illegible]

ARP GEOTECHNICAL LTD



SITE:	Catherines Walk
CLIENT:	Leeds & Yorkshire Housing Association
JOB No:	LYH/01

[illegible]

**TP1 TEST 1**

Depth of pit 3.400

Depth water at start 1.270

Length of hole at max. filled water level 2.200

Length of hole at base 1.500

Average 1.850

Volume outflow (75% - 25% effective depth):

$V_{p75} = 1.28 \text{ m}^3$

Width of hole at surface 0.700

Width of hole at base 0.600

Average 0.650

Mean surface area (inc. base of pit)

$a_{p50} = 6.5275 \text{ m}^2$

Maximum effective depth

2.13

75% effective depth

1.598

50% effective depth

1.065

25% effective depth

0.533

Time for discharge (75% and 25% effective depth):

$t_{p75-25} = 0 \text{ minutes}$

Depth of hole 3.400

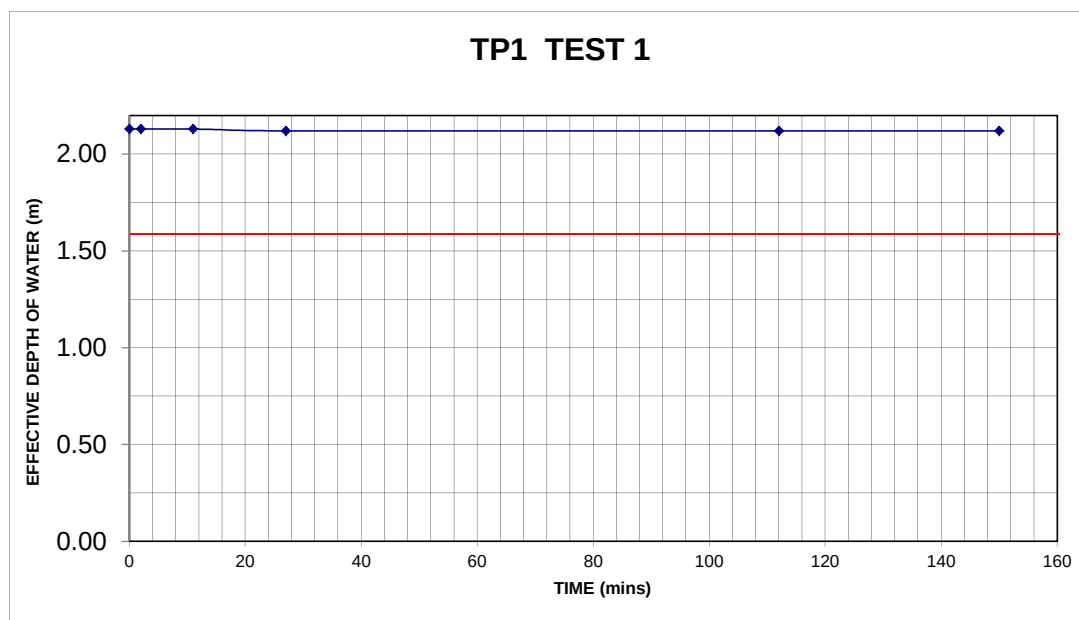
50% Effective depth 1.065

Soil infiltration rate:

$f = \text{m/s}$

Time in mins at 75% effective depth (see curve)

Time in mins at 25% effective depth (see curve)



**TP2 TEST 1**

Depth of pit 1.700

Depth water at start 0.960

Length of hole at max. filled water level 1.800

Length of hole at base 1.300

Average 1.550

Width of hole at surface 0.700

Width of hole at base 0.600

Average 0.650

Volume outflow (75% - 25% effective depth):

$V_{p75} = 0.37 \text{ m}^3$

Mean surface area (inc. base of pit)

$a_{p50} = 2.6355 \text{ m}^2$

Maximum effective depth 0.74

75% effective depth 0.555

50% effective depth 0.370

25% effective depth 0.185

Time for discharge (75% and 25% effective depth):

$t_{p75-25} = 0 \text{ minutes}$

Depth of hole 1.700

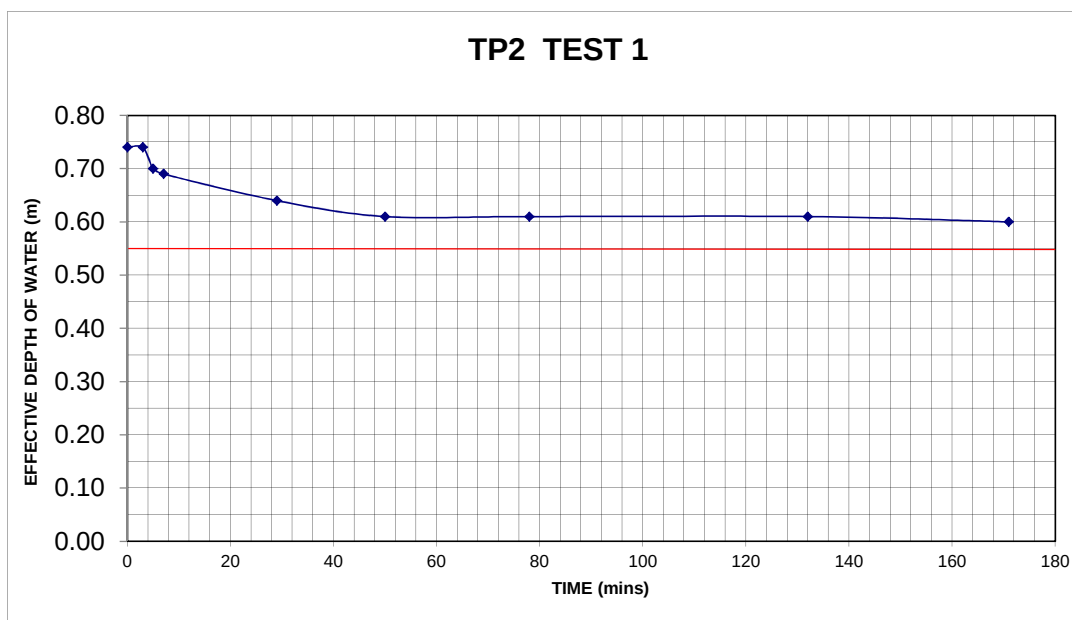
50% Effective depth 0.370

Soil infiltration rate:

$f = \text{m/s}$

Time in mins at 75% effective depth (see curve)

Time in mins at 25% effective depth (see curve)



**TP3 TEST 1**

Depth of pit 4.000

Depth water at start 1.340

Length of hole at max. filled water level 2.500
 Length of hole at base 2.000
 Average 2.250

Volume outflow (75% - 25% effective depth):
 $V_{p75} = 1.80 \text{ m}^3$

Width of hole at surface 0.600
 Width of hole at base 0.600
 Average 0.600

Mean surface area (inc. base of pit)
 $a_{p50} = 8.931 \text{ m}^2$

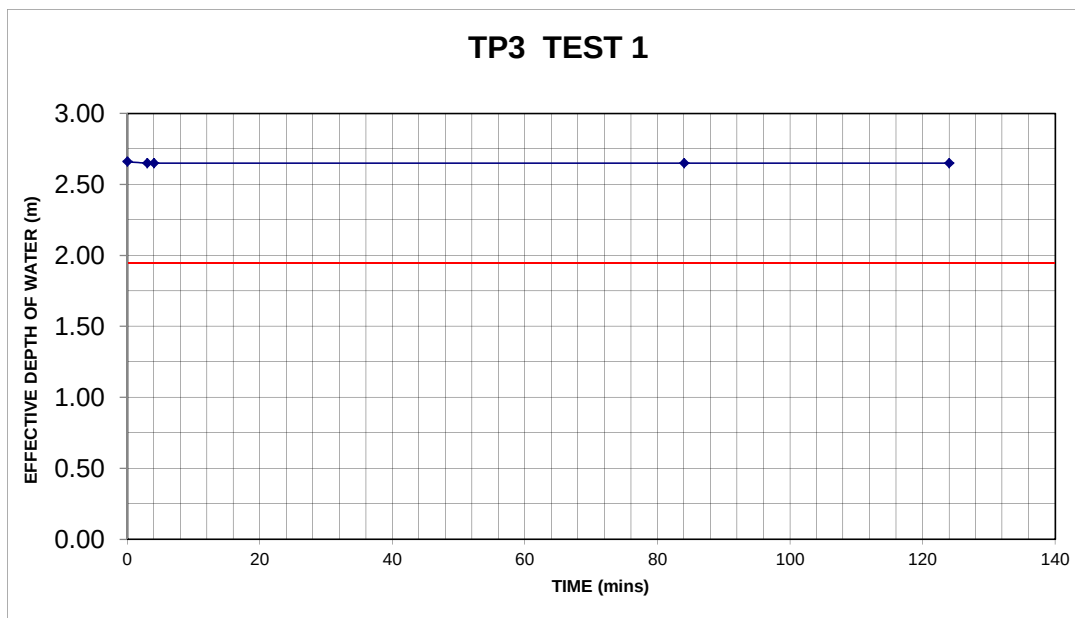
Maximum effective depth 2.66
 75% effective depth 1.995
 50% effective depth 1.330
 25% effective depth 0.665

Time for discharge (75% and 25% effective depth):
 $t_{p75-25} = 0 \text{ minutes}$

Depth of hole 4.000
 50% Effective depth 1.330

Soil infiltration rate:
 $f = \text{m/s}$

Time in mins at 75% effective depth (see curve)
 Time in mins at 25% effective depth (see curve)



**TP4 TEST 1**

Depth of pit 1.300

Depth water at start 0.750

Length of hole at max. filled water level 2.300

Length of hole at base 2.000

Average 2.150

Volume outflow (75% - 25% effective depth):

$V_{p75} = 0.35 \text{ m}^3$

Width of hole at surface 0.600

Width of hole at base 0.600

Average 0.600

Mean surface area (inc. base of pit)

$a_{p50} = 2.8025 \text{ m}^2$

Maximum effective depth 0.55

75% effective depth **0.413**

50% effective depth 0.275

25% effective depth **0.138**

Time for discharge (75% and 25% effective depth):

$t_{p75-25} = 0 \text{ minutes}$

Depth of hole 1.300

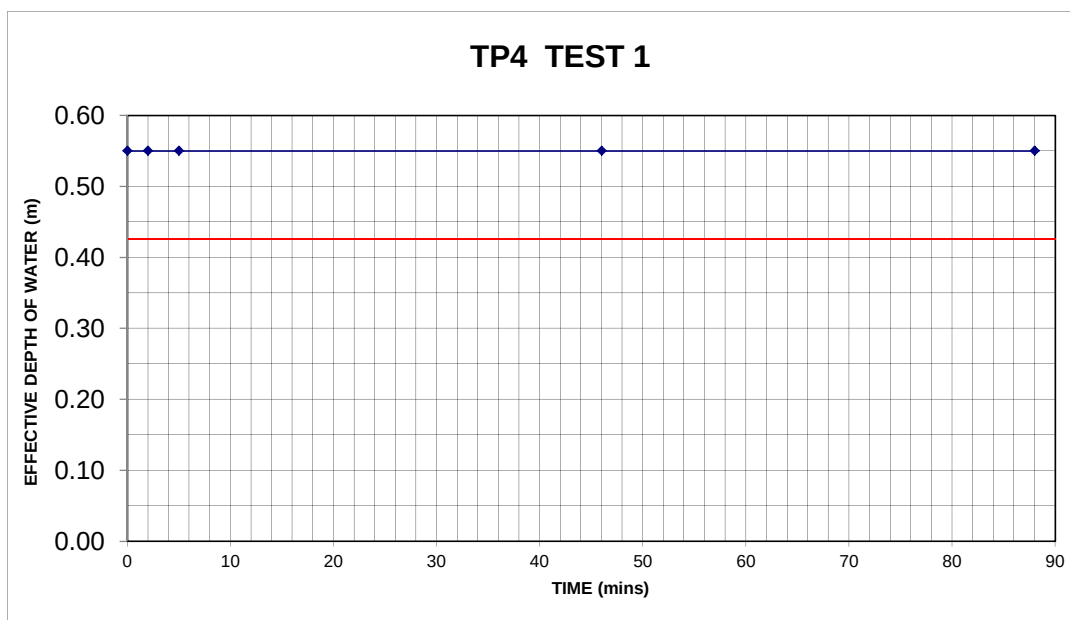
50% Effective depth 0.275

Soil infiltration rate:

$f = \text{m/s}$

Time in mins at 75% effective depth (see curve)

Time in mins at 25% effective depth (see curve)



APPENDIX E

LABORATORY TEST CERTIFICATES AND SCREENING VALUES



ARP GEOTECHNICAL LIMITED
SOIL CONTAMINANT SCREENING VALUES
RESIDENTIAL WITH HOME-GROWN PRODUCE

Determinand	S4UL (mg/kg)			C4SL (mg/kg)		
Arsenic	37			37		
Cadmium	11			22		
Chromium (trivalent)	910					
Chromium (hexavalent)	6			21		
Lead				200		
Inorganic Mercury	40					
Selenium	250					
Copper	2400					
Nickel	130					
Zinc	3700					
Acidity (pH)	*Should be Greater Than 5			*Should be Greater Than 5		
	1% SOM	2.5% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Acenaphthene	210	510	1,100			
Acenaphthylene	170	420	920			
Anthracene	2,400	5,400	11,000			
Benzo(a)anthracene	7.2	11	13			
Benzo(a)pyrene	2.2	2.7	3			5
Benzo(b)fluoranthene	2.6	3.3	3.7			
Benzo(g,h,i)perylene	320	340	350			
Benzo(k)fluoranthene	77	93	100			
Chrysene	15	22	27			
Dibenzo(a,h)anthracene	0.24	0.28	0.3			
Fluoranthene	280	560	890			
Fluorene	170	400	860			
Indeno(1,2,3-cd)pyrene	27	36	41			
Naphthalene	2.3	5.6	13			
Phenanthrene	95	220	440			
Pyrene	620	1,200	2,000			
Phenols	120	200	380			
Total TPH	*Above 500, speciate and compare with values below:					
C5 to C6 Aliphatic	42	78	160			
C6 to C8 Aliphatic	100	230	530			
C8 to C10 Aliphatic	27	65	150			
C10 to C12 Aliphatic	130	480	760			
C12 to C16 Aliphatic	1100	2,400	4,300			
C16 to C35 Aliphatic	65,000	92,000	110,000			
C35 TO C44 Aliphatic	65,000	92,000	110,000			
C5 to C7 Aromatic (Benzene)	70	140	300			
C7 to C8 Aromatic (Toluene)	130	290	660			
C8 to C10 Aromatic	34	83	190			
C10 to C12 Aromatic	74	180	380			
C12 to C16 Aromatic	140	330	660			
C16 to C21 Aromatic	260	540	930			
C21 TO C35 Aromatic	1100	1,500	1,700			
C35 TO C44 Aromatic	1100	1,500	1,700			
Asbestos	*Should be None Detected			*Should be None Detected		

* In House Value/Approach S4UL = Suitable 4 Use Level, CIEH/LQM 2014 C4SL = Cat 4 Screening Level, DEFRA, 2014

Blank cell indicates no published value or in-house value. Some values presented are above saturation limits.

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ARP GEOTECHNICAL LTD
Chartered Consulting Engineers

CONTROLLED WATERS SCREENING VALUES

Determinand	Screening Value for Potable Use * (µg/l)	Screening Value for Environment # (µg/l)
Arsenic	10	50
Boron	1000	2000
Cadmium	5	0.08-0.25
Chromium (total)	50	4.7
Copper	2000	1-28
Lead	10	7.2
Mercury	1	0.05
Selenium	10	-
Nickel	20	20
Zinc	5000	8-125
Sulphate	250,000	400,000
pH	6.5-10	6-9
Anthracene	-	0.1
Benzo(a)pyrene	0.01	0.05
Benzo(b)fluoranthene	Sum (4) <0.1	Sum (2) <0.03
Benzo(k)fluoranthene		Sum (2) <0.002
Benzo(g,h,i)perylene		
Indeno(1,2,3-c,d)pyrene		
Fluoranthene	-	0.1
Naphthalene	-	2.4
Phenols	0.5 (BWR)	7.7
Benzene	1	10
Toluene	700 (WHO)	50
Ethylbenzene	300 (WHO)	-
Xylene	30 (WHO)	30
Total TPH	-	200 (SWAD)

JUNE 2014

Sources, unless indicated otherwise above:

* = UK Drinking Water Standards (DWS)

= Environmental Quality Standards (EQS), hardness dependent where range shown.

WHO = World Health Organisation Drinking Water

BWR = Bathing Water (Classification) Regulations 1991

SWAD = Surface Water (Abstraction for Drinking Water) (Classification) Regulations 1996



Certificate of Analysis

Certificate Number 17-13979-1

13-Nov-17

Client ARP Geotechnical
5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

Our Reference 17-13979-1

Client Reference EPH/03

Order No (not supplied)

Contract Title LAND AT CATHERINE'S WALK, BARNLEY

Description 21 Soil samples, 1 Leachate sample.

Date Received 26-Oct-17

Date Started 26-Oct-17

Date Completed 13-Nov-17

Test Procedures Identified by prefix DETSn (details on request).

Notes **This report supersedes 17-13979. Extra testing**

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick
Contracts Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 17-13979-1

Client Ref EPH/03

Contract Title LAND AT CATHERINE'S WALK, BARNSELEY

Lab No	1248948	1248949	1248950	1248951	1248952	1248953	1248954
Sample ID	TP1	TP2	TP3	TP4	TP5	TP5	TP6
Depth	0.05-0.10	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.30	0.40-0.70	0.00-0.20
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	6.1	16	18	18	17	3.9	19
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.6	0.6	0.7	0.5	0.8	0.7
Chromium III	DETSC 2301*	0.15	mg/kg	7.6	18	18	16	19	44	21
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	17	36	33	36	29	39	30
Lead	DETSC 2301#	0.3	mg/kg	7.7	49	50	49	58	21	53
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.12	0.20	0.13	0.14	< 0.05	0.13
Nickel	DETSC 2301#	1	mg/kg	9.9	15	13	16	13	48	15
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	25	66	65	70	68	97	76
Inorganics										
pH	DETSC 2008#			7.8	5.9	6.8	6.2	5.7	6.3	5.8
Organic matter	DETSC 2002#	0.1	%	2.2	5.5	4.1	4.6	4.1	2.0	5.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	15	18	12	16	14	18	21
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.08	0.07	0.06	0.09	0.03	0.08
Petroleum Hydrocarbons										
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10	< 10	< 10	780	< 10
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	0.7	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1
Pyrene	DETSC 3301	0.1	mg/kg	0.6	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.4	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	3.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3	0.3	< 0.3	0.3

Summary of Chemical Analysis

Soil Samples

Our Ref 17-13979-1

Client Ref EPH/03

Contract Title LAND AT CATHERINE'S WALK, BARNSELEY

Lab No	1248955	1248956	1248957	1248958	1248959	1248960	1248961
Sample ID	TP7	TP8	TP9	WS1	WS2	WS3	WS4
Depth	0.00-0.30	0.20-0.50	0.10-0.40	0.20-0.40	0.00-0.20	0.10-0.30	0.10-0.30
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	16	12	70	16	18	15	15
Cadmium	DETSC 2301#	0.1	mg/kg	0.7	0.6	0.5	0.6	0.7	0.5	0.5
Chromium III	DETSC 2301*	0.15	mg/kg	18	11	18	15	18	18	18
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	27	29	55	26	31	28	26
Lead	DETSC 2301#	0.3	mg/kg	45	73	17	45	46	52	46
Mercury	DETSC 2325#	0.05	mg/kg	0.11	0.18	< 0.05	0.09	0.11	0.10	0.12
Nickel	DETSC 2301#	1	mg/kg	14	15	31	14	16	15	14
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	63	63	21	77	120	83	74
Inorganics										
pH	DETSC 2008#			6.0	7.0	7.9	5.4	6.7	5.7	5.8
Organic matter	DETSC 2002#	0.1	%	4.3	3.1	1.6	4.0	5.7	5.5	6.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	15	16	57	16	27	16	25
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07	0.09	0.09	0.08	0.08	0.09	0.11
Petroleum Hydrocarbons										
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.5	< 0.1	< 0.1	< 0.1	0.1	0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	1.9	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	0.4	< 0.3	< 0.3	< 0.3	0.4

Summary of Chemical Analysis

Soil Samples

Our Ref 17-13979-1

Client Ref EPH/03

Contract Title LAND AT CATHERINE'S WALK, BARNSELEY

Lab No	1248962	1248963	1248964	1248965	1248966	1248967	1248968
Sample ID	WS5	WS6	WS7	WS8	WS9	WS10	WS11
Depth	0.10-0.30	0.10-0.30	0.20-0.40	0.10-0.30	0.10-0.30	0.10-0.30	0.10-0.30
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17	19/10/17
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Arsenic	DETSC 2301#	0.2	mg/kg	17	16	12	17	12	18	4.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.6	0.6	0.6	0.6	0.7	0.6	0.5
Chromium III	DETSC 2301*	0.15	mg/kg	20	20	16	17	16	11	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	66	31	25	32	24	40	13
Lead	DETSC 2301#	0.3	mg/kg	100	57	50	49	44	13	19
Mercury	DETSC 2325#	0.05	mg/kg	0.14	0.14	0.09	0.12	0.09	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	12	13	15	14	15	24	10
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	74	71	66	100	82	34	46
Inorganics										
pH	DETSC 2008#			6.0	5.9	5.7	6.1	5.7	8.1	7.8
Organic matter	DETSC 2002#	0.1	%	5.4	5.8	4.3	5.4	4.2	4.8	2.3
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	17	17	16	18	81	26	19
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.09	0.08	0.08	0.09	0.04	0.07	0.03
Petroleum Hydrocarbons										
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	81
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.2
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.2
Phenanthrene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.6	1.4
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	0.2
Fluoranthene	DETSC 3301	0.1	mg/kg	0.3	0.1	0.3	0.2	< 0.1	0.9	1.2
Pyrene	DETSC 3301	0.1	mg/kg	0.3	0.1	0.2	0.2	< 0.1	0.6	1.0
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	0.1	< 0.1	< 0.1	0.6	0.4
Chrysene	DETSC 3301	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.5	0.5
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	0.1	< 0.1	0.2	< 0.1	< 0.1	0.4	0.5
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.3
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.6	0.8
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	0.3
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.3
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6	< 1.6	< 1.6	< 1.6	5.6	7.3
Phenols										
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.3	< 0.3	0.4	< 0.3	< 0.3	< 0.3

Summary of Chemical Analysis

Leachate Samples

Our Ref 17-13979-1

Client Ref EPH/03

Contract Title LAND AT CATHERINE'S WALK, BARNSELY

Lab No	1254111
Sample ID	TP9
Depth	0.10-0.40
Other ID	
Sample Type	LEACHATE
Sampling Date	19/10/17
Sampling Time	n/s

Test	Method	LOD	Units
Metals			
Arsenic, Dissolved	DETSC 2306	0.16	ug/l
			3.4

Summary of Asbestos Analysis

Soil Samples

Our Ref 17-13979-1

Client Ref EPH/03

Contract Title LAND AT CATHERINE'S WALK, BARNSELEY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1248948	TP1 0.05-0.10	SOIL	NAD	none	Colin Patrick
1248949	TP2 0.00-0.30	SOIL	NAD	none	Colin Patrick
1248950	TP3 0.00-0.30	SOIL	NAD	none	Colin Patrick
1248951	TP4 0.00-0.30	SOIL	NAD	none	Colin Patrick
1248952	TP5 0.00-0.30	SOIL	NAD	none	Colin Patrick
1248953	TP5 0.40-0.70	SOIL	NAD	none	Colin Patrick
1248954	TP6 0.00-0.20	SOIL	NAD	none	Colin Patrick
1248955	TP7 0.00-0.30	SOIL	NAD	none	Colin Patrick
1248956	TP8 0.20-0.50	SOIL	NAD	none	Colin Patrick
1248957	TP9 0.10-0.40	SOIL	NAD	none	Colin Patrick
1248958	WS1 0.20-0.40	SOIL	NAD	none	Colin Patrick
1248959	WS2 0.00-0.20	SOIL	NAD	none	Colin Patrick
1248960	WS3 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248961	WS4 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248962	WS5 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248963	WS6 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248964	WS7 0.20-0.40	SOIL	NAD	none	Colin Patrick
1248965	WS8 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248966	WS9 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248967	WS10 0.10-0.30	SOIL	NAD	none	Colin Patrick
1248968	WS11 0.10-0.30	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 17-13979-1
 Client Ref EPH/03
 Contract LAND AT CATHERINE'S WALK, BARNSELEY

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1248948	TP1 0.05-0.10 SOIL	19/10/17	GJ 60ml, PG		
1248949	TP2 0.00-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248950	TP3 0.00-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248951	TP4 0.00-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248952	TP5 0.00-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248953	TP5 0.40-0.70 SOIL	19/10/17	GJ 60ml, PG		
1248954	TP6 0.00-0.20 SOIL	19/10/17	GJ 60ml, PG		
1248955	TP7 0.00-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248956	TP8 0.20-0.50 SOIL	19/10/17	GJ 60ml, PG		
1248957	TP9 0.10-0.40 SOIL	19/10/17	GJ 60ml, PG		
1248958	WS1 0.20-0.40 SOIL	19/10/17	GJ 60ml, PG		
1248959	WS2 0.00-0.20 SOIL	19/10/17	GJ 60ml, PG		
1248960	WS3 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248961	WS4 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248962	WS5 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248963	WS6 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248964	WS7 0.20-0.40 SOIL	19/10/17	GJ 60ml, PG		
1248965	WS8 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248966	WS9 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248967	WS10 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1248968	WS11 0.10-0.30 SOIL	19/10/17	GJ 60ml, PG		
1254111	TP9 0.10-0.40 LEACHATE	19/10/17	GJ 60ml, PG		

Key: G-Glass P-Plastic J-Jar G-Bag

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months



LABORATORY REPORT REPORT



4043

Contract Number: PSL17/5217

Report Date: 02 November 2017

Client's Reference: LYH/01

Client Name: ARP Associates
Northwest House
5/6 Northwest Business Park
Servia Hill
Leeds
LS6 2QH

For the attention of: Elliot Heatherington

Contract Title: Land at Catherines walk, Barnsley

Date Received: 25/10/2017

Date Commenced: 25/10/2017

Date Completed: 2/11/2017

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

R Berriman
(Quality Manager)

L Knight
(Senior Technician)

C Marshall
(Laboratory Manager)

A Fry
(Senior Technician)

5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: rgunson@prosoils.co.uk
awatkins@prosoils.co.uk

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

PSL
Professional Soils Laboratory

LAND AT CATHERINES WALK, BARNSELEY

Contract No:

PSL17/5217

Client Ref:

LYH/01

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



PSL
Professional Soils Laboratory

LAND AT CATHERINES WALK, BARNSELEY

Contract No:

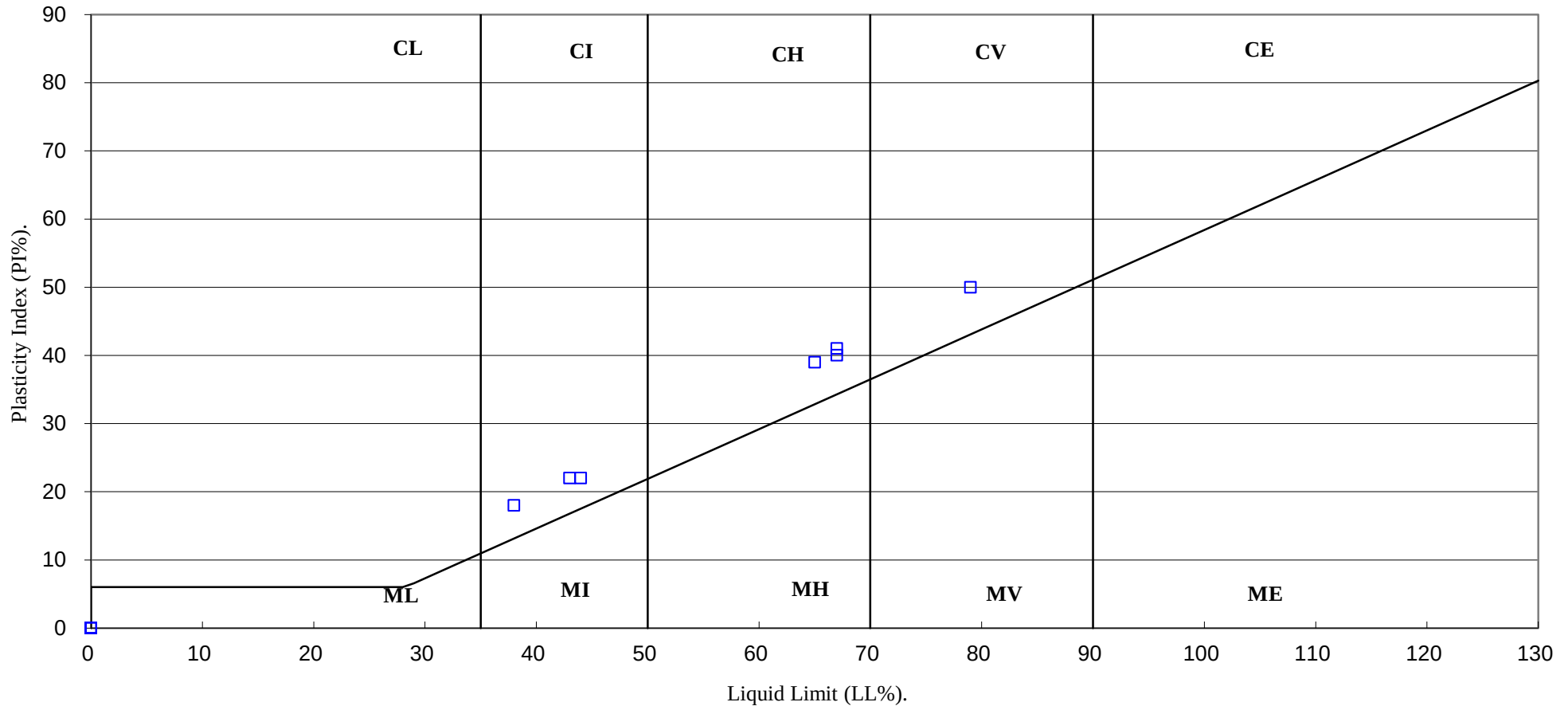
PSL17/5217

Client Ref:

LYH/01

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(BS5930 :2015)



PSL
Professional Soils Laboratory

LAND AT CATHERINES WALK, BARNSELEY

Contract No:

PSL17/5217

Client Ref:

LYH/01